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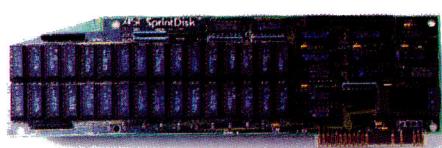
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inCider's BBS (bulletin-board system)
On line 24 hours: (603) 924-9801

inCider (ISSN #0740-0101) is published monthly by CW Communications/Peterborough, Inc., 80 Pine Street, Peterborough, NH 03458. Phone: (603) 924-9471. Second-class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second class mail registration number 9590.) Subscription rates in U.S. are \$24.97 for one year, \$38.00 for two years and \$53.00 for three years. In Canada and Mexico, \$27.97—one year only. U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. **Postmaster:** Send address changes to inCider, Subscription Services, P.O. Box 911, Farmingdale, NY 11737. (Send Canadian changes of address to: inCider, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.)

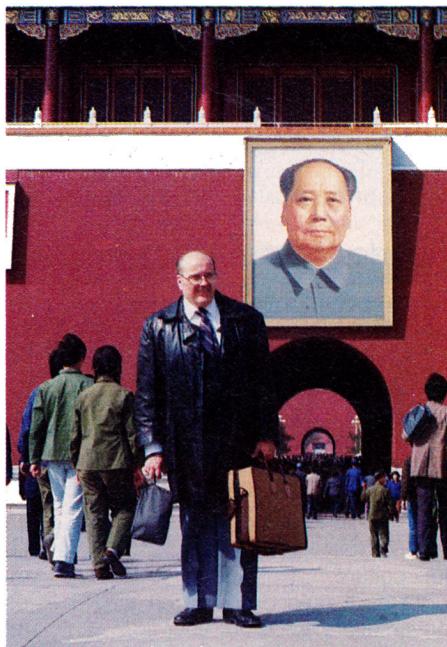
Photo & illustration credits: Cover, page 38 (bottom)
Ray Cranbourne; pages 38-39 (top) 40, 43, Robert B. Smith; pages 46, 47 Phil Geraci; pages 49, 54, 55, 112 Frank Cordelle; page 56 Katherine Mahoney; page 63 Roger Goode.

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User-Group Culture Goes On Line



by Deborah de Peyster

"If Apple supplied all the answers, user groups would have no rumors, gossip, or information to pass on. And some of the fun would be gone."

More than 300 Apple users from locations around the world were there. Apple Computer executives, sharing spaghetti in a home in Portola Valley, California, were there, too. They had all gathered on line for the first question-and-answer conference of its kind. And as MAUG systems operator Neil Shapiro exclaimed in type that crawled across the screen, the event was a tribute to "good old user-group culture."

But, I thought as I eavesdropped on the electronic conversation, what is "user-group" culture? Perhaps by reviewing the on-line event itself, the details would emerge.

It appears that a basic premise of user groups is the interaction of "them" and "us." "Them" is the manufacturer, and "us" is the dedicated user who spends time and money trying to figure out how to make what we bought more useful. In this particular case, "us" was members of MAUG (Microcomputer-networked Apple User Group) asking questions, and "them" was Apple, sort of answering. For example:

"Us": When will the new II be released, and how will it be different from the //c and //e?

"Them": How do I put this nicely? I can't discuss it—you'll cuss. Save some money, though. . . . Let me just say we'll make Apple II users happy, whenever and however.

"Us": Does Apple plan to enter the color-computer business in the way Atari and Commodore have recently?

"Them": No!!! I like my job, so we'll do it right!

"Us": We hear rumors about an MS-DOS coprocessor board for the //e. Any comment on that?

"Them": I've always liked coprocessor boards since my early Apple days, when I got my initiation to PIP with a SoftCard.

Other, more technical responses were more direct, such as Apple's Pete McDonald's offer to answer specific questions about a ROM fix for the bug in Apple's 3½-inch drive. (Reach him through E-mail ac-

count #76703,3030 if you're having a problem with that.) Apple also said it will definitely begin selling an Apple II networking solution based on AppleTalk by the end of the year.

But Apple's lack of direct answers to some questions was okay. It appears to be part of the culture. I guess if Apple told everybody everything all of the time, user groups would cease to exist. Part of the fun and camaraderie of a user group seems to come from the effort required to get information. If Apple supplied all the answers, user groups would have no rumors, gossip, or information to pass on. And some of the fun would be gone.

A good user-group culture also appears to thrive on a diverse mix of people. During the more than three-hour on-line conversation, MAUG members from Israel, Canada, Peru, and the People's Republic of Berkeley, California (it is a different world out there), were represented. Names such as The Kahn on //c, Squid Kid, Wink-FM 97 (who was gagged early on for being obnoxious), and Captain Video (who was reprimanded for "ungagging" people) were also heard. (Gag means to block the user's ability to write messages on screen.)

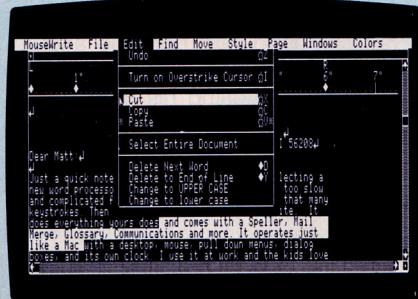
David Winer, developer of the ThinkTank outline processor, made a few on-line comments, especially once he learned that about 300 people were watching their screens. "Everyone go out and buy Think-Tank," he wrote. And Steven Jobs, cofounder of Apple and former chairman, logged on with a brief comment: "Good night, JLGee. . . . see you in the marketplace in '87." (He was addressing Apple's vice president of product development, Jean-Louis Gassée, and Apple's plans for a more powerful Macintosh. Jobs and his new company, Next, plan to build a competitive machine.)

Yes, I guess it was a good example of user-group culture. After all, information was exchanged amid jokes and a good deal of bantering. Side conversations occurred between users who discovered they knew each other. Connections were made. And one of the most important connections was reaffirmed as Apple wrote, "We're listening." ■

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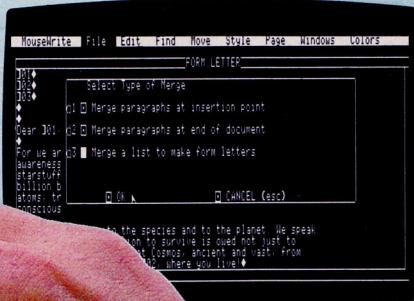
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LETTERS

More on Cataloger

I received a disk from a reader in California who couldn't get my ProDOS Cataloger (May 1986, p. 112) to work properly. Upon examining her disk, I found a problem in the program that shows up if the volume names contain 15 characters. As none of my volume names is that long, I had never encountered this problem.

The following line changes will let the program handle longer volume names:

```
560 PRINT PR$;" ";FMAX;"FILES";
:HTAB(27): PRINT "SUBDIRECTORY"
1570 N$ = LEFT$(N$,16) :HTAB 15:
PRINT N$
2220 P = 39 - LEN (MF$(F)):IF P > 0
THEN MF$(F) = MF$(F) +
LEFT$(SP$,P)
```

Ed Verdelotti
216 Missimer Lane
Vinton, VA 24179

Spreadsheet Bugs

My AppleWorks v1.3 seems to have a bug in the spreadsheet function @COUNT. This function is supposed to give you the number of nonblank entries in a list of cells. It works when the cells are adjacent and can be specified as a range, such as @COUNT(A1...A4). When the cells are listed, though, as in @COUNT(A1,A2,A3,A4), the number returned is the number of cells, blank or not. The same is true of the @AVG function, which seems to be a combination of @SUM divided by @COUNT.

I've gotten around this problem in the spreadsheets I use for grading (I'm a high-school math teacher) by keeping the cells adjacent. I've had to sacrifice some of the logical order of my data, though, to do so. It seems unlikely that a program as popular and as "old" as AppleWorks would have a bug of this nature. Am I misreading the way these functions are supposed to work?

Howard Jackson
127 Southern Boulevard
Albany, NY 12209

You're reading the @COUNT function wrongly, as we read it. @COUNT

(list) counts the number of nonblank entries in a list. This function counts entries in a range of cells—say, (A1...A6)—because if you bothered to type in @COUNT(A1,A2,A3,A4) you would have already counted the number of entries.

AppleWorks doesn't average numbers by combining @SUM and @COUNT.

Your point about the @AVG function is well taken, though. AppleWorks assumes that blank cells contain zeros in a calculation such as @AVG(A1,A2,A3). If A1 has a value of 90 and A2 and A3 are blank, the @AVG(A1,A2,A3) function returns an average of 30—although you'd expect an average of 90. Every student knows the difference between a zero on a test and no score, but AppleWorks doesn't.

We recommend you look at James G. Troutman's AppleWorks gradebook spreadsheet in this issue (p. 63) and see how he solved the problem.

—eds.

Hard-Earned

Your review of the Franklin Ace 2200 (March 1986, p. 38) was excellent. In addressing the primary concern of software limitations, *inCider* "hit the nail on the head" once again.

As owners of the Franklin 1000 series, software availability continues to be the number-one problem for us. It's further aggravated by the fact that programs that boot and run on one machine may not work on another because of ROM differences. Money saved on initial purchase price is actually "hard-earned."

One must take into account the time and effort expended searching for information and programs to get the basic machine utilization owners of other systems take for granted.

While the Franklin Computer Corporation was undergoing Chapter 11 reorganization, technical support and service/repair weren't the best because of the comparatively limited number of 1000-series machines sold, changes in management, staff cutbacks, and other problems. A potential 2000 buyer should consider that Franklin's troubled financial history may repeat itself.

Also, it appears the Ace 1000/1200

line has been formally abandoned with the introduction of the 2000. The F-DOS operating system, reportedly a vast improvement over earlier Franklin DOS versions, doesn't seem to be available as an upgrade for the 1000 line.

A potential buyer should determine Franklin's long-term upgrade and product add-on plans for the 2000 series before putting his or her cash on the barrelhead. Will the 2000 series be similarly abandoned as improved lines are introduced?

These two factors are close seconds to the main problem of software availability/compatibility the review points out, but your readers should benefit from being aware of them.

Gerald Pilak
Franklin Information Xchange
of Southeastern Wisconsin
2823 South Herman Street
Milwaukee, WI 53207

Keeping Orders

I've been trying to use an Apple //e for a growing mail-order business for more than two years. So far, I've been limping along with slow business programs I've modified for my needs. Specifically, I need three linkable data bases (mailing list, inventory, and accounts receivable), custom input screens and/or programs (order entry, quotation generation, and purchase-order entry), customized outputs (collection notices, customer orders, purchase orders, mailing-list labels, inventory reports, and quotations), and appropriate file-maintenance utilities.

Since our Apple is used by non-computer-whiz employees, I don't want the typical complicated spreadsheet or data-base programs. Versaform XL is the only program I've found that's designed to do what I want. (I can program it myself, even with my modest skills.) Unfortunately, Versaform XL doesn't run on Apple computers. Have I overlooked any similar program that will run on an Apple, or do I have to dump the Apple and buy an IBM?

Donald A. Peterson
Cedar & Mulberry, RR #2
Gays Mills, WI 54631

Interlude II

A BED OF ROSES—INTERLUDE # 136

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Money Magazine: "Sometimes it's easier to tell a computer what you want than it is to tell your partner."

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We recommend you check out some of the better high-powered accounting packages for the Apple II before falling prey to MS-DOS. Try Manzanita's *BusinessWorks*, BPI's *Business Accounting*, or Peachtree's *Back to Basics*. On the other hand, if you're feeling especially creative and have a man-month or more to kill, you could create a custom program with AppleWorks, but it would be slow.

—eds.

No Renewal

I've been using a program called Tax Manager for the past few years and have found it complete and quite easy to use. In previous years, I've received a renewal notice from Micro Lab and just sent in a check and my old disk to get each update. This year, though, when I didn't hear from the company at the usual time, I mailed a check with a letter requesting the renewal.

I haven't heard from the company or received my check back. I've sent follow-up letters to the address printed on Micro Lab's previous correspondence and in a 1986 software catalog. The Postal Service hasn't returned my letters, either.

The address I used is Micro Lab, 2310 Skokie Valley Road, Highland Park, IL 60035. Any help you could offer would be greatly appreciated.

Joseph F. Keady, Jr.
15415 Sylvan Glen Drive
Dumfries, VA 22026

Our information is a bit limited, too. We have an address for Micro Lab listed as 2699 Skokie Valley Road, Highland Park, IL 60035. The company's telephone number, (312) 433-7550, has been disconnected. Micro Fun, producer of the game Miner 2049er, is listed at the same address.

—eds.

Born Again

What an interesting editorial in your April issue ("Apple Sees the Light," p. 6), using religious terminology and metaphor to get across a point about Apple computers.

Regarding the first paragraph, I'd like to mention that the term "born again" has its origins in the New Testament Gospel of John. The term is used not so much to indicate a return to faith as a coming to faith for the first time. Jesus indicates that being

born physically is only the first birth, and a spiritual birth is necessary for anyone to enter heaven. This isn't a spiritual rebirth.

Anyway, it's an interesting article. If I may suggest my own interpretation of what has been transpiring at Apple, I would call it a reformation—a return to a previous interpretation of basic doctrine.

I enjoy *inCider* very much and look forward to my copy each month.

Jim Proud
6754 South Lakeview Street
Littleton, CO 80120

I'd like to comment on Deborah de Peyster's editorial in the April 1986 issue. I consider myself a born-again Christian, but not at all as described in this article.

The term "born again" comes from the Bible—specifically, the book of John, chapter 3. In verse 3, Jesus says you must be born again to see the kingdom of God. In verses 6 and 8, Jesus explains that being born again means being born in the spirit. It isn't simply a matter of "returning to faith with renewed vigor," as the editorial indicates. To become a citizen of God's kingdom, I must be born twice—once physically and once spiritually. The spiritual birth is what Jesus called being born again.

Bud Lengtat
15157 Magnolia Road
Grass Valley, CA 95949

Mad as Heck

I enjoy *inCider* and look forward to receiving it every month in the mail. It's informative, stimulating, and very practical. I have only one complaint—Writing Software International's use of profanity in its advertisement.

Most of the ads you publish aren't offensive to any of your readers. Why allow one that could be? Please be more selective.

Thank you for a great magazine. I hope you'll maintain the high quality I've seen in both articles and ads until the last couple of months.

Bud Lengtat
15157 Magnolia Road
Grass Valley, CA 95949

WSI recently changed its ad copy to eliminate any offensive terminology; please see p. 75 in the July 1986 issue.

—eds.

Indexing

I'm interested in obtaining an index of *inCider* magazine articles. Can you help me with this?

Robert Barrett
920 Mark Avenue
Hamilton, OH 45013

In every January issue, we publish an index to the preceding 12 issues. You can also find a comprehensive index to the magazine on the *inCider* BBS. To reach the BBS, use your modem to call (603) 924-9801. —eds.

Kudos

I'd like to express my appreciation for *inCider*'s tutorial AppleWorks in Action, by Ruth Witkin. It's refreshing to find an article that a hopeless non-techie like myself can follow and implement. I went through a tough weekend a month or so ago trying to get my own mailing list going. If I'd had this article I could have done it in the morning and easily made my Saturday afternoon tee-off instead of missing it. Thanks for realizing there are some neophytes among your readers—and some perpetual neophytes, who love it when a piece is written in words they understand.

Jerry Dublin
3020 Canyon Valley
Plano, TX 75075

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 price of Andrew Tobias' *Managing Your Money* (MECA) is incorrect as quoted in our April 1986 issue (p. 49). The correct price is \$199.95.

The phone number for Synergetic Communications is incorrect as printed in our June issue (p. 53). The correct phone number is (415) 548-8170.

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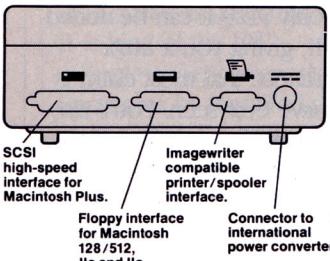
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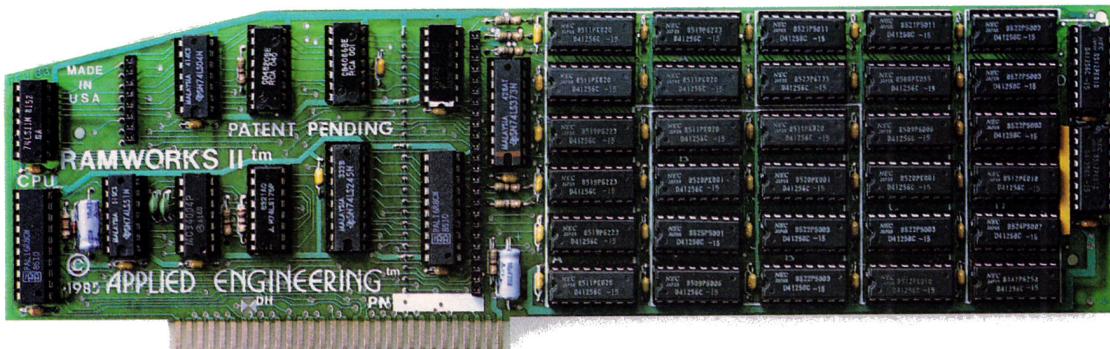
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Works II even expands the clipboard. And auto segments large files so they can be saved on two or more disks.

RamWorks II, nothing comes close to enhancing AppleWorks so much.

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Applied Engineering has always offered the largest memory for the IIe and RamWorks II 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 II has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks II by plugging into the

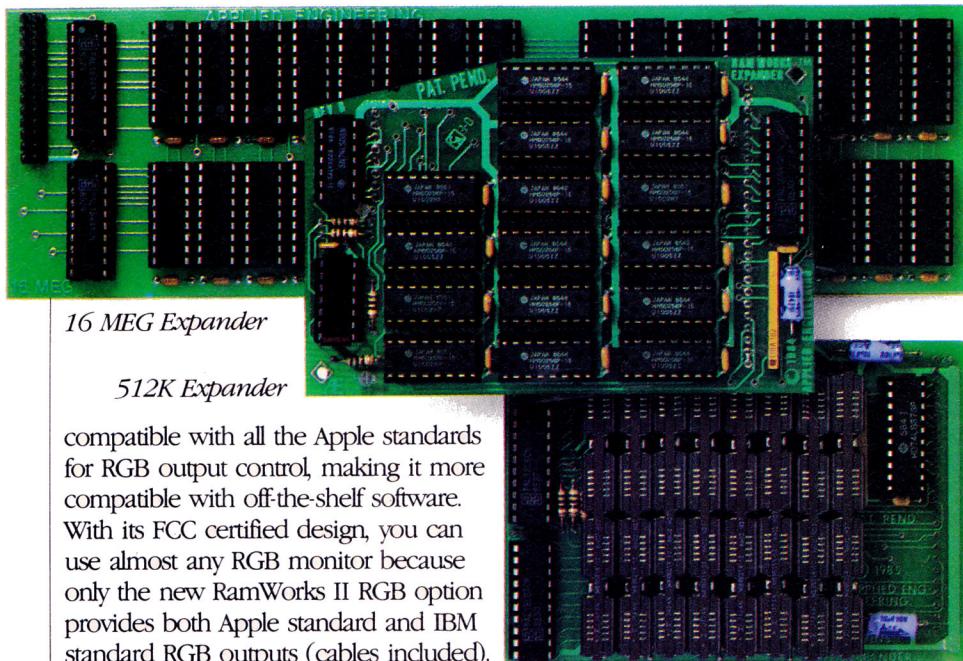
industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for over 20 years.

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If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks II, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks II to recapture most of your investment!

The Ultimate in RGB Color.

RGB color is an option on RamWorks II and with good reason. Some others combine RGB 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 II 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 II, 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 II RGB option is more than just the ultimate in color output because unlike others, it's fully



16 MEG Expander

512K Expander

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 II RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks II with no slot 1 interference (works on the original RamWorks, too) and remember you can order the RGB option with your RamWorks II or add it on at a later date.

True 65C816 16 Bit Power.

RamWorks II has a built-in 65C816 CPU port for direct connection to our optional 65C816 card. The only one capable of linearly addressing more than 1 meg of memory for power applications like running the Lotus 1-2-3™ compatible program, VIP Professional. Our 65C816 card does not use another slot but replaces the 65C02 yet maintains full 8 bit compatibility.

Endorsed by the Experts.

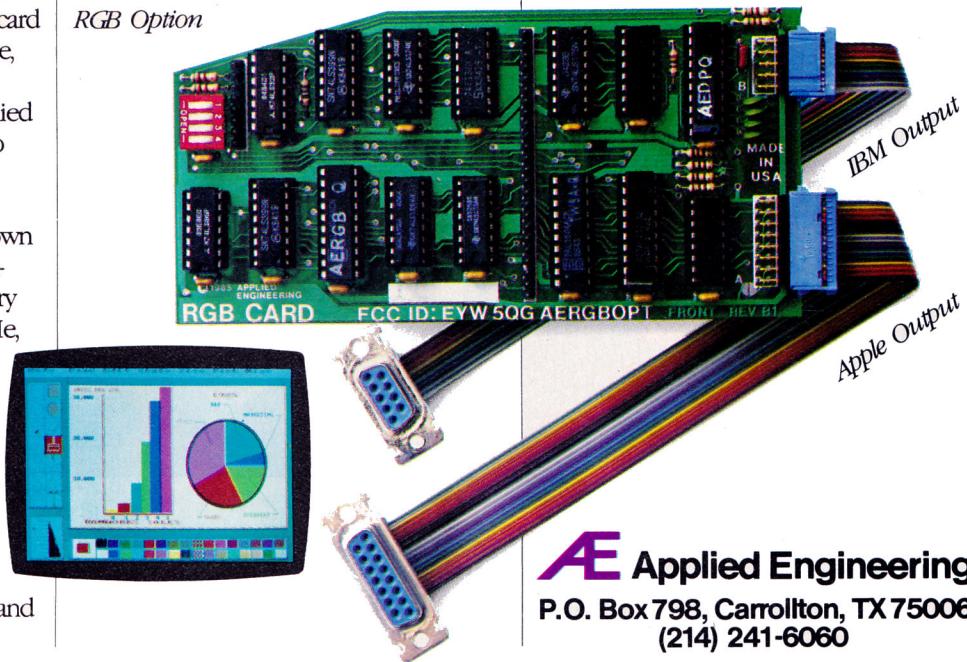
Steve Wozniak, creator of the Apple Computer said "I wanted a memory card for my Apple that was fast, easy to use, and very compatible, so I bought RamWorks." A+ magazine said "Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks...I like the product so much that I am buying one for my own system." inCider magazine said "RamWorks II is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars...For my money, Applied Engineering's RamWorks II is king of the hill."

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- RamDrive™ the ultimate disk emulation software included free
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NEWS LINE

edited by *inCider* staff
Future II's

The latest word is that the Apple //x will indeed be ready on schedule in September.

Apple software developers are thrilled after playing with the new Apple's 16-bit coprocessors, its megabyte of built-in RAM, and its custom sound and graphics chips. One developer confided that his company took all its personnel off its major Atari 1040ST project: "[The Apple] is that hot."

Publishers are preparing a whole range of software—everything from games to business programs. One widely known developer—a company that created a "blockbuster" product for the Apple //e and //—has all but finished writing an integrated package (spreadsheet, data base, and word processor) that takes advantage of the new machine's sound and graphics, as well as its 16-bit coprocessor.

Courtesy of Taurus Photos/Marty Heitner

Another company, VIP Technologies, is ready to ship VIP Professional, an integrated package emphasizing a Lotus 1-2-3-like spreadsheet. To use the current version of VIP Professional, you need an expansion board with a 16-bit option, but clearly the big push for this product will come with the Apple //x.

We're especially happy to see simulation-game makers drooling over the new II. They're raving about its enhanced graphics and the ease of writing code for a machine that can address more than 64K at a time.

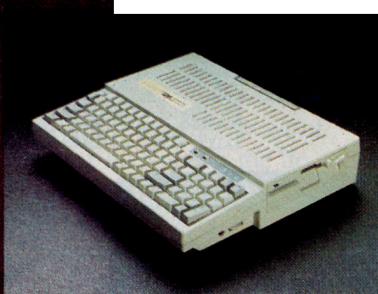
The "game market," given up for dead when kids got bored with Space Invaders, may be only in its infancy. Powerful (and, let's hope, inexpensive) machines with audio/video quality approaching that of television may breathe new life into consumer publishers such as Activision, Broderbund, Electronic Arts, and Mindscape.

The business market for the new Apple II may have to wait, though. Bill Goodhew, president of Peachtree Software, reports that his company would like to put its impressive accounting packages, including a new query system that integrates all its Back to Basics modules, onto "Apple's future products." But, he warns, "we have to go with the market demand, and the Apple II market doesn't warrant" supporting the //x.

And one major publisher of financial software for the consumer market claims that programs like his that are written for the Apple Pascal operating system don't translate well to the //x, "which runs strictly ProDOS. It's difficult, but not impossible."

We still haven't heard anything about communications software for the //x. We also have no definitive word on the name of the new machine, but Cortland, Baldwin, and a number of other names of varieties of apples have been mentioned. At this writing, the price of the Apple //x is by no means fixed: We're hoping for something less than \$1000, but we're expecting something more than \$2000.

—P.S.



Lasers and Lawyers

The Laser 128, the Hong Kong //c clone with 128K, a disk drive, a keyboard with numeric keypad, and serial, parallel, and RGB ports for an amazing \$395, is here to stay. Either that, or it's an illegal import due to be smashed by a judge's gavel. Which you believe depends on whom you hear—the Laser's manufacturer Video Technology and U.S. vendor Central Point Software, or Apple Computer, which has hit Video Technology with a copyright and patent-infringement lawsuit.

The legal battle goes back to 1984 in Hong Kong, when Apple claimed the Laser 128's predecessor, the II Plus-compatible Laser 3000, was an illegal copy. When the 3000 came to America last year, so did the lawsuit. Video Technology sought a judgment from Chicago's U.S. District Court that its clone was not a copy, and Apple filed a countersuit. Now both sides have added claims regarding the 128 to their existing suits.

As of late April, the case showed no sign of a quick conclusion, or even of coming to trial. According to Dave Gish, president of Video Technology's U.S. subsidiary in Elk Grove Village, Illinois, "[The lawyers are] still in the discovery stage, with information being exchanged." Meanwhile, the 128 has passed U.S. Customs scrutiny. Gish says he's "confident in our [legal] position," and is building a network of Laser dealers.

"We do have some background and experience in making a computer compatible so it doesn't infringe," Gish points out.

"We're an up-front company; we're not trying to back-door [or copy] the computer at all, and we've been up front with Apple."

According to Marianne Lettieri, an Apple Computer spokeswoman, Apple is seeking an injunction to prevent Video Technology from distributing the 128 in the United States on the basis that it infringes on Apple's patent and copyright.

"We have closely examined the 128 and determined it to be in violation of Apple Computer's copyright and patent. Accordingly, we have amended our previous suit against Video Technology to include the 128," Lettieri says.

Apple has been unwilling to reveal its specific complaints. But according to Michael Brown, president of direct-mail distributor Central Point Software of Portland, Oregon, the charges concern two areas. One is a copyright claim on a disk called Universal DOS, licensed from a developer in California and included with the first few hundred Lasers. "When we heard it might be a problem, we just discontinued it. It wasn't a real Apple-compatible DOS anyway, though some of the commands were the same," Brown says.

The second issue concerns two video patents and one floppy-disk controller patent, Brown says: "I looked at them, and Apple's out in left field. They're just reading the broadest interpretation of the patents you can get, way beyond what the courts are holding. The video circuitry in the Laser is all standard NTSC cookbook stuff."

Meanwhile, Brown claims that interest in the lawsuit has "practically" doubled sales of the Laser 128: "We're catching up with back orders now; last week we got about 1500 [Lasers], and next week we should get 2000. By the end of June, we should be able to ship 20,000 units a month." —E.G.

Editor's note: While the legal jury is still out, inCider's verdict on the 128 will appear in next month's Reviews section.

Closed for Good?

Some Apple //c owners face an unexpected problem when they open their machines to add memory-expansion boards from Applied Engineering and Checkmate Technology. Applied's Z-RAM card and Checkmate's MultiRam CX require you to handle a screwdriver and, more importantly, to pop the memory-management unit (MMU) chip off the motherboard and install it on the memory-expansion card.

There, say disgruntled customers, is the rub. Some //c MMU's are soldered onto the motherboard, not socketed in place. The average man in the street can't remove and replace a soldered memory-management unit in less than 30 minutes. More than one novice has damaged the //c trying.

"The problem isn't super-severe," claims Dan Pote, president of Applied. He sells 60 Z-RAM's a day, and finds that "only three or four [//c's] have the soldered chips that present a problem."

Applied's latest installation instructions offer advice on telling soldered chips from socketed—it isn't hard. If you can easily remove the MMU, it's probably socketed. If it won't come off, and it looks as if there's melted metal around the edges, don't force it—it's soldered. If you're the unlucky owner of a soldered Apple //c, don't despair: Applied Engineering can install the Z-RAM card for you.

Kin Seto, Apple's Third-Party Hardware Evangelist, was adamant: "It is not Apple's policy to solder any chips on the logic board. What happened is that the //c was not designed to be an open system, and our manufacturers in Singapore found that soldering the MMU was a cost-effective measure [and quality control was easier]. My impression is that it was a mistake [to solder the MMU]. We have taken input from our third-party developers, Checkmate and Applied Engineering, and acted accordingly."

Andy Niemic, president of Checkmate, was impressed with "the fantastic response from Apple. We told them a few of our customers were having trouble, and they corrected the problem almost at once." He says that all Apple II's, "as far as I can tell, have socketed MMU's. If they have soldered MMU's, it's not that big a deal to add MultiRam, but you might want your dealer to do the job."

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Your dealer, or you if you're handy, can solve the soldering problem in either of two ways. You can remove the solder, or you can swap the logic board for one with a socketed MMU. Your dealer shouldn't charge you for the exchange.

Apple has seen the error of its ways: Rick Wright, Apple's Engineering Program Manager for the //c, contacted his engineers in Singapore and reassured us that "as of now, all Apple //c's will have the MMU's in sockets."

The ghost of Steve Jobs' "closed box" still haunts Apple in curious ways. But Apple seems willing to pay the price—even in increased production costs—of keeping its architecture open, helping third-party developers enhance the II, and giving your computer the power it needs. —P.S.

Apple Eyes CD-ROM

Apple is "eager to talk" to technical innovators and market powers interested in developing CD-ROM, write-once, or erasable optical products, according to Mike Liebhold, manager of optical-media applications for Apple Computer.

Liebhold, who addressed software vendors at the 1986 Software Publishers Association conference in San Francisco, was quick to point out that Apple has no formal announcement to make at this time, then reaffirmed that the company is committed to leadership in technology and more likely than not "will do something interesting."

Any product Apple would bring to market would bear "Apple's superior user interface," and have "bottom-line value," Liebhold told vendors. An Apple product would also be "well matched to the market" and



be an appropriate solution to a genuine business or educational problem.

Liebhold noted that some of the more promising applications for CD-ROM and related technologies in businesses, schools, and libraries lie in the areas of reference, communications, productivity, and training. Examples of productivity tools he cited include spreadsheets with a high core of templates, word-processing packages that incorporate a standard business reference, and business-communication tools that come with a library of bit-mapped images.

The only Apple-based CD-ROM product on the market to date is the co-processor board and drive for the //e from MicroTrends of Schaumburg, Illinois. MicroTrends sells a 68000-based motherboard named "Jonathan" with 512K of memory, a daughterboard named "Jonathan-CD," and a Philips drive. The total cost is \$2190 for the three pieces, all of which are required to access a CD-ROM disk.

—W.L.McK.

Flash: Another Franklin

Think the Apple-compatible market is heating up? First came Franklin's sleek //e clone, the Ace 2200 (see review, March 1986, p. 38), then Video Technology's //c-styled Laser 128 (see above). At June's Consumer Electronics Show, Franklin announced a //c clone of its own: the Ace 500, promised for August delivery for \$499.

The 500 resembles the 2200—a black wedge with a 90-key keyboard, including numeric keypad and function keys—but with one side-mounted disk drive and no expansion slots. On the other hand, the 65SC02-based Ace has 256K of memory, expandable to 512K and compatible with Applied Engineering's RamWorks standard.

Other features include parallel, serial, mouse/joy-stick, and second-drive ports along with composite and RGB video output. Franklin claims the 500 will be its most compatible entry yet when it comes to Apple software; besides 40- or 80-column displays, users can switch between the unenhanced and mouse-text character sets.

While it costs \$104 more than Central Point Software's mail-order Laser, Franklin's reputation for solid engineering should make the Ace 500 a strong market contender. Stay tuned for full details and a review.

—E.G.

Better Mind Tools

The next three to five years could bring some dramatic changes in the way we think about personal computers, Jean-Louis Gassée told developers and publishers at the recent 1986 Software Publishers Association conference in San Francisco.

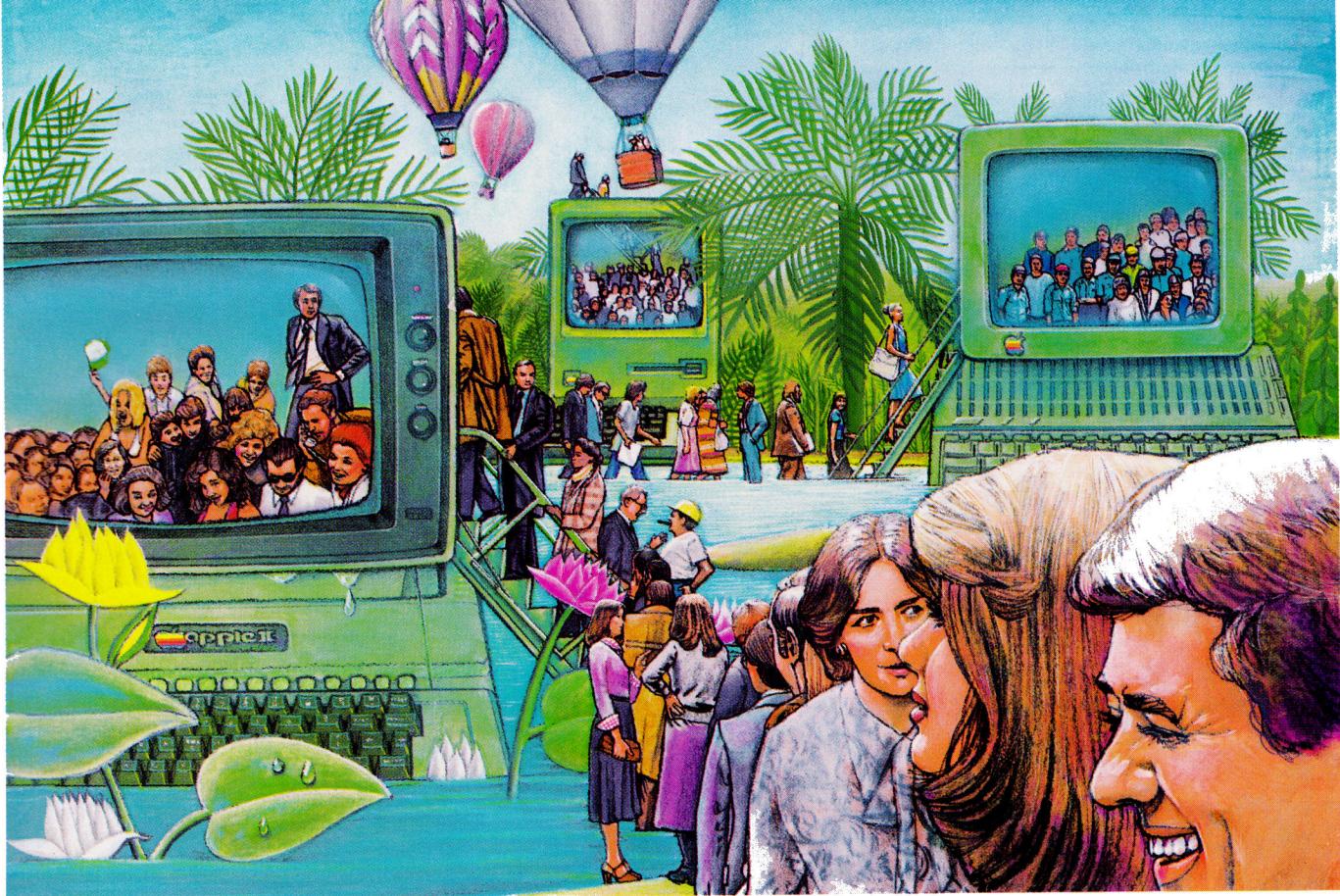
"As more and more MIPS [millions of instructions per second] are put on a single board, we will be able to use the computer to do vastly more complicated tasks," Gassée said. "When we can address more of a single problem on one computer, we will have better design decisions."

Gassée explained that "design decision" does not necessarily refer to a solution to an engineering problem, but to the overall quality of any business decision. One person with all relevant information in front of him can generally make a better decision than a committee, Gassée continued.

He predicted new-product opportunities for the development community—in particular, more simulation software—as hardware becomes more powerful.

—W.L.McK.

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, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025.



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RamWorks' chips are soldered to the board making repair more difficult and lengthy.

In the past Steve Wozniak endorsed RamWorks. However, we wonder if he or any other competent engineer approves of scraping identifying numbers off RamWorks' components. They say this is done to slow down the clone makers, but it also keeps honest users and dealers from making a quick repair.

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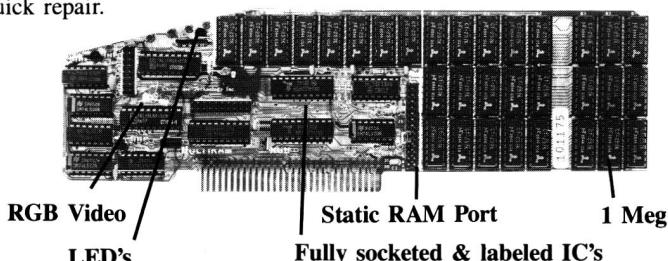
RamWorks II®

RamWorks II® memory expansion cards sit on the front where they may touch a printer board. What's more, the original 512K RamWorks I® card has become obsolete because it can't be combined with RamWorks II®.

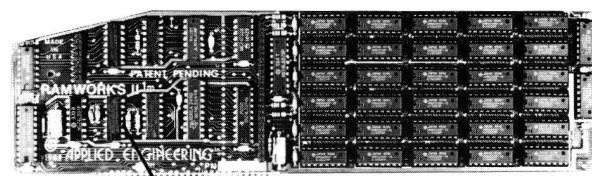
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APPLE CLINIC

by Jim Sather and Paul Statt

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.

To Enhance or Not to Enhance?

What are the advantages of enhancing my Apple //e? Are there any disadvantages? If I enhance it, can I still run all the programs I now have?

Gerry Orten
Grafton, WI

The Apple //e Enhancement kit contains a 65C02 MPU, new program ROMs, and a new video ROM with mouse text. Improvements in the ROM code (firmware) include improved IRQ/BREAK handling, a 6502 miniassembler, an ASCII Monitor input mode, a Monitor search command, faster and smoother 80-column text scrolling, and Monitor, Applesoft, Pascal, and ProDOS interpretation of lowercase keyboard input.

A few programs and peripheral cards don't work with the enhanced //e (see " //e Enhancement and Peripherals," May 1986, p. 21). I don't know all the software packages that have problems, but I do know that the inverse-display line at the top of the DOS 3.3 Apple Writer screen has mouse text where uppercase letters should be. I also know that older versions of Beagle Bros' Double-Take don't scroll backward in 80-column mode. Beagle Bros corrected the problem as soon as the enhancement became available.

I have the enhancement in my //e. I didn't fight city hall on this one, because the improvements are substantial. The Monitor and scrolling improvements are important to me, and programs that don't work with the enhancement are balanced out by programs that work only with the enhancement. Also, since Apple now produces the Apple //e with the enhancement, the enhanced //e is gradually becoming the standard //e.

If you can burn 2764 EPROMs, it's fairly easy to build a socket/adapter to let you select mouse text or old inverse text for programs that have text-display compatibility problems. The construction of the socket/adapter from a 28-pin IC socket and a switch is shown in the accompanying **Figure**, reproduced from my book Understanding the Apple IIe.

The source file for the 2764 is made up of the old video ROM and the enhanced video ROM. Transfer the contents of both ROMs to a disk file using your PROM burner. Merge the files (BLOAD OLD.VID, A\$2000; BLOAD NEW.VID, A\$3000) and burn to 2764. Install the 2764 in the socket/adapter, and install this combination in the motherboard video-ROM socket. You can now switch the mouse text on and off.

A product called Switchback lets you switch between the enhanced and unenhanced versions of all three affected ROMs. In other words, you can switch the enhancement in or out with the exception of the 65C02. The 65C02 doesn't cause any incompatibility problems that I know of, so

Switchback is a very good solution to enhancement compatibility problems. You need an NTSC (American) Apple //e and both the enhanced and unenhanced ROMs to use Switchback.

Switchback has one drawback, though. Its instruction sheet states that you can select between firmware versions only when you turn on your computer. In my opinion, requiring the user to turn the Apple off and on to switch functions is bad design.

-15

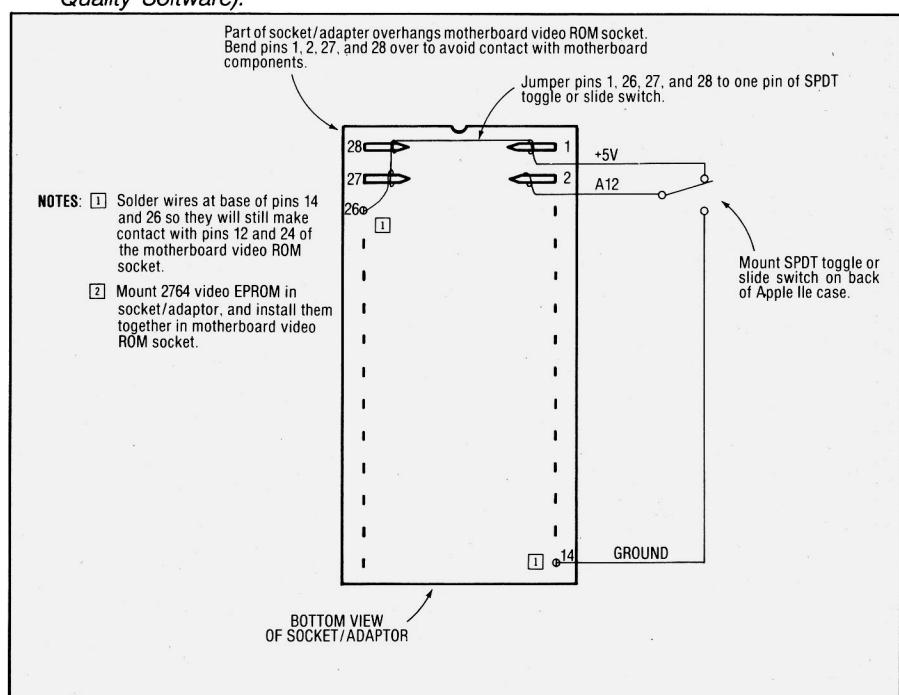
Enhancement Too Expensive

I'm thinking about enhancing my "old" Apple //e, but my Apple dealer charges \$70. A friend of mine heard of a way to order the chips directly from Apple. Do you have any information about this? I'd prefer not to spend \$70 to upgrade a \$2000 computer because Apple decided to put new chips in.

Joel Lazzaro
Saginaw, MI

You have a good point, Joel. Why should you pay to keep your com-

Figure. 64K video EPROM adapter (reproduced with permission from Quality Software).



puter current when Apple offers an upgrade that makes the old computer incompatible with some software? Looking at it from the other direction, though, the enhancement contains a number of valuable improvements, and it's reasonable for Apple to make a profit from the products it develops, including upgrades.

Apple sells products directly to some special customers, such as dealers, certified Apple developers, and educational groups. Your friend probably knows someone who's in a

position to take advantage of such status and told him he ordered the enhancement kit directly from Apple. For the vast majority of Apple owners, though, there's no way to order products directly from Apple.

It's possible to copy the enhancement ROMs to EPROM if you have access to a PROM burner that burns 2764 and 2732 EPROMs. Most user groups have a member or two with such a PROM burner. A 65C02 and three EPROMs cost about \$20-\$30, depending on your sources. Of

course, you're infringing on Apple copyrights if you copy the ROMs for yourself without purchasing them, so I don't condone it.

—J.S.

More Apple //c Numeric Keypad

This letter is in reference to "Apple //c Keypad" in the April 1986 Apple Clinic (p. 25). My company markets a numeric keypad for the Apple //c that requires no electrical modification to the computer. The keypad simply plugs into the keyboard connector, and the cable is routed out the side. The keyboard plug connects to pins on the keypad plug.

We also have a version that lets you unplug the keypad when you don't need it. You install this version the same way, but you must cut out a notch in the side of the computer and mount a 25-pin DB connector.

We're very proud of our product and feel that it's a solution to a problem that faces many Apple //c users. It's been on the market since January 1986.

John G. Richmond
C & M Manufacturing
Huntsville, TX

Thanks for the information about your product, John. I haven't actually seen it in use, so I can't give it a firsthand recommendation, but I'm sure many Apple //c users will be glad to know that such a product is available.

—J.S.

Wrong Keyboard ROM

I got a "deal" on a numeric keypad for my Apple //e at a computer flea market, but I have a problem: My Tectron keypad came without instructions. It works fine, but the up-and down-arrow keys don't function. Since the keypad was designed to plug into the Apple //e keypad connector, all keys should operate.

Can I reconfigure the jumper pad near the keyboard connector to fix my problem?

Robert J. Bell III
Bensalem, PA

Apple made a minor change in the keyboard ROM during production of early NTSC (American) Apple //e's. The company never publicized this fact; I know of it only because I discovered it while writing Understanding the Apple //e. Apple made minor changes to the Dvorak layout, and

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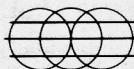
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Table. Converting a 342-0132-B keyboard ROM to 342-0132-C equivalent EPROM.

Address	Old Data				New Data				Remarks
242C, 2478,	262C	3F	2F	3F	2F	22	27	22	27
20A4, 20CC,	22A4, 22CC,	24A4, 24CC,	26A4	08	08	08	08	0A	0A
24E8,	26E8	1B	1B	1B	0B	0B	0B	0B	keypad left
20F4, 2118,	22F4, 2318,	24F4, 2518,	26F4	15	15	15	15	08	08
211C,	231C,	251C,	271C	3F	3F	3F	3F	1B	1B
		20	20	20	20	15	15	15	15
									Dvorak / ?
									Dvorak " "
									keypad ESC
									keypad space
									keypad left
									keypad up
									keypad down
									keypad right
									keypad ?
									keypad / ?
									keypad left
									keypad up
									keypad down
									keypad right

deleted space and question-mark ASCII from the numeric-keypad layout to accommodate the up and down arrows. This change affects only users of the Dvorak keyboard layout or the numeric keypad on early Apple //e's.

It sounds as if you've got the older keyboard ROM, since your up- and down-arrow keys don't work. If so, pressing the up arrow yields escape ASCII, and pressing the down-arrow yields left-arrow ASCII. The earlier ROM is labeled 342-0132-B; the current ROM is labeled 342-0132-C.

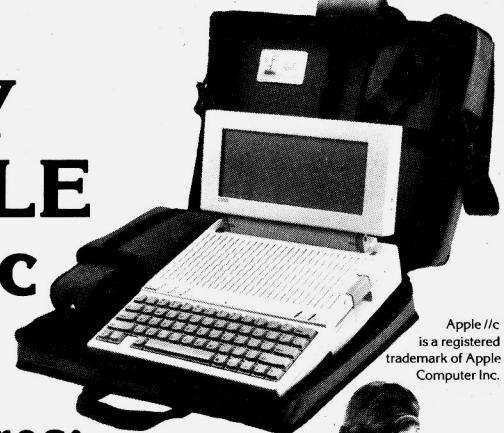
It's possible to modify the -B keyboard ROM if you have access to a PROM burner that can program 2716 EPROMs. Use the PROM burner to read the -B ROM, then save the ROM contents as an \$800-byte binary disk file. BLOAD the -B ROM file to \$2000-\$27FF and make the changes shown in the Table. BSAVE the contents of \$2000-\$27FF to disk so that you'll have a working copy of the -C ROM, and burn the same data to the 2716 EPROM as a replacement for the original keyboard ROM.

If you don't have access to a PROM burner, try asking your Apple dealer for a free swap. I've sent your address to an Apple employee who's familiar with Apple //e keyboard ROMs, Robert. I'm hoping he'll send you information about obtaining a current keyboard ROM.

The X6 jumper near the keyboard connector has nothing to do with an external keypad. Soldering X6 ties the SHIFT' line to the PB2 game-I/O pushbutton input, so that pressing either shift key activates PB2. This is equivalent to the Apple II Plus shift-key mod, and may be necessary if you want to utilize old II Plus software that doesn't recognize lowercase keyboard ASCII. I recommend soldering X6 for //e owners who don't have anything connected to PB2, so they'll have a convenient way to activate PB2 should the need arise. —J.S.

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Magic Window Patch

For Patch Central, here's a modification to the Gemini 10X printer driver of Magic Window version 2.E0. The original driver reverses the superscript- and subscript-control characters (control-A and control-B, respectively). To patch the driver, boot DOS, then BLOAD GEMINI.10X.OBJ0. Save a copy of the original by typing BSAVE GEMINI.10X.OBJ0.ORIG, A\$800, \$L200. Type CALL -151 to enter the Monitor, and change \$908 from \$81 to \$80, and change \$90C from \$80 to \$81. Type BSAVE GEMINI.10X.OBJ0, A\$800, L\$200 to save the patched driver.

Tony Pizza
Camarillo, CA

Yours is the first patch sent to Patch Central (see Apple Clinic, April 1986, p. 21), and it's exactly what I'm looking for. I don't use Magic Window or a Gemini printer, so I have no way of knowing about the

discrepancy or patch. Your patch makes it possible for Apple Clinic to help the community of Apple users, even though I'm unfamiliar with the subject. Thanks for your contribution, Tony.

I hope other readers will contribute to Patch Central. I probably won't print all the patches I receive, but I'll keep a list of them and print it from time to time. —J.S.

Apple II Plus Obsolete?

I use my Apple II Plus with ScreenWriter II for word processing, and with VisiCalc for home accounts, income-tax calculations, and making tables of scientific data. I also use The Accountant, a special-purpose accounting program, to maintain two checking accounts and look after rental property and investments. I also use PFS:File. My Apple has 64K of RAM, and I'm sure I could do these things better and faster if my computer had more memory.

Is my Apple II Plus obsolete? The articles and ads in *inCider* clearly indicate a bias against the old II and II Plus. Apple peripherals and software are limited, in many cases, to the //e and //c. Furthermore, Apple Computer's offer to let schools trade in their old Apples for new ones implies that the old ones leave something to be desired.

Although memory-expansion cards are available for the II Plus, the keyboard doesn't have the extra keys found on later computers, and it's not clear whether I'll be able to use software designed for the //e and //c.

John McClendon
Lincoln, NE

Obsolescence comes, crushingly quickly, to microcomputers, but it's a relative thing. Though it isn't unequivocally obsolete, there's no doubt the Apple II Plus is more obsolete than the //c and //e. This is true partly because the 128K of standard RAM and the improved keyboard, display, and firmware encourage development of software that takes advantage of the more powerful //e and //c. It's also true because a computer that's been out of production for more than three years simply doesn't generate as much excitement in the marketplace and, consequently, not as much hardware or software support as it once did.

Products designed only for the //e and //c, coupled with improved versions of Apple II computers, contribute further to Apple II Plus obsolescence. Even though Apple fights this trend with the development of important peripherals like the Slinky RAM card, I believe it's inevitable. The II Plus isn't obsolete, but Apple //e owners have a far greater advantage than II Plus owners.

Apple owners who use their computers as extensively and broadly as you do would definitely benefit from owning an Apple //e or //c, but you'd still be saddled with compatibility problems. Most older software doesn't utilize the big //e and //c RAM cards you see advertised. The RAM-card manufacturers include software to modify AppleWorks to utilize the extra RAM, but leave modification of most other programs to the usually unwilling software vendors. —J.S.

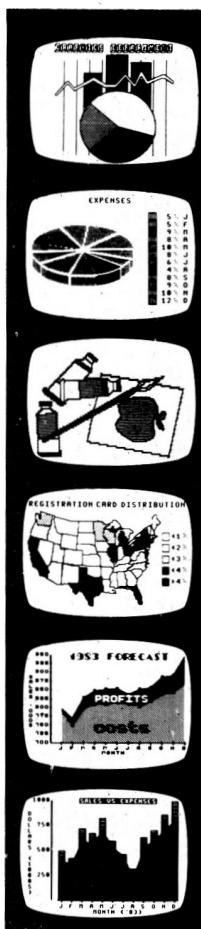


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AppleWorks for All

We'd like to use AppleWorks with our II Plus. Can you tell me what changes or additions would be necessary, and whom we can contact for parts and information?

Anthony Schiraldi
Mira Mesa High School
San Diego, CA

AppleWorks requires ProDOS, so you'll need 80 columns and 64K—try Apple's 80-column card. Software that configures AppleWorks to run with a II Plus is available from two sources: Norwich Data Services (P.O. Box 356, East Norwich, NY 11732, 516-922-9584) sells PlusWorks for \$49.95, and Davka (845 North Michigan Avenue, Suite 843, Chicago, IL 60611-2201, 312-944-4070) offers ItWorks for \$39.50. NDS suggests that Apple's Apple II Memory Expansion board, designed to work with the II Plus, makes a nice addition. —P.S.

TaxWorks

The federal government now allows W-2 reporting on 5 1/4-inch disks. We have 160 employees, and I'd like to convert to magnetic-media reporting. We use enhanced Apple //e computers. What software can I use to enter data? Would the AppleWorks spreadsheet do the job?

Robert Hampton
Brothers of the Holy Cross
Austin, TX

Thanks for sending along the Social Security Administration's "Annual Reporting Plan for W-2 Information Using 5 1/4" Diskettes." The requirements are as follows:

- a. "A diskette must be 5 1/4" in diameter.
- b. Data must be recorded in standard ASCII code.
- c. Records must be fixed length, 128 bytes per record.
- d. Delimiter characters comma (,) and carriage return/line feed (cr/lf) must not be used.
- e. Diskettes must meet one of the following specifications...: capacity: 140kb; tracks: 48 tpi; single-sided/single-density; sector size: 256; operating system: Apple II."

If "Apple II operating system" means ProDOS, AppleWorks should do the trick. You should print your spreadsheet files to disk—a disk text (ASCII) file. When you put that information into a data base, each record

must be 128 bytes long (I'm assuming the SSA knows how long a single record needs to be, and that it's 128 bytes or less). Don't use anything other than a letter of the alphabet as a filename, pathname, or record name—that is, as a "delimiter character"—and you'll be safe on point d. Standard Apple disks are fine. —P.S.

AppleWorks and UniDisk 3.5

Last April I had a chance to visit the U.S.A. and buy a UniDisk 3.5. It was a short trip, so I asked the dealer just about installation. "Plug it into your computer and run it; the Owner's Manual is very clear," he said. I wondered how I could choose to access either the UniDisk 3.5 or the external drive.

When I got home, I installed my UniDisk 3.5 according to the manual. The UniDisk is properly plugged into the Apple //c, and my old external drive is plugged into the UniDisk. The //c external drive works as usual, but my UniDisk 3.5 ejects disks and its red light comes on—I have no access to that disk.

AppleWorks offers three options for saving files: drive 1, drive 2, and ProFile or other ProDOS directory. None succeeded in waking up the UniDisk. I tried calling my UniDisk 3.5 a ProFile, but AppleWorks next wants a pathname. Since I can't access the UniDisk, I have no formatted disks and, thus, no pathnames.

What should I do to access the UniDisk?

Paulo Almeida Machado
Campinas, Brazil

I hope not everyone in the U.S. was as unhelpful as that Apple computer dealer. The UniDisk 3.5 Owner's Manual basically says nothing in five different languages—you need extra help.

To use AppleWorks with your //c, your dealer must change motherboards. Yours let you down badly, and I'm afraid I can't help. The UniDisk 3.5 motherboard upgrade for the //c also fixes some bugs in ROM.

You can write data files on the UniDisk 3.5 with any version of AppleWorks. If you want to boot AppleWorks 1.1 or 1.2 from a 3 1/2-inch disk, you'll need your ProDOS Utilities to format a 3 1/2-inch floppy, and you'll have to copy all your AppleWorks start-up and program files to that disk.

One Apple Clinic reply regarding AppleWorks 1.3's compatibility with

the UniDisk 3.5 may have caused some confusion (see the June issue, p. 27). The answer is correct, if by compatible you mean that AppleWorks comes on a 3 1/2-inch disk and that you can format a 3 1/2-inch disk from AppleWorks.

On the other hand, you can use a UniDisk 3.5 in any slot of your unenhanced //e as a disk drive for data with no problem: Format the disk with the ProDOS Filer, and use the ProFile option in AppleWorks. You can boot AppleWorks from your UniDisk 3.5 by writing PR#x in BASIC, where x is the number of the slot in which your UniDisk 3.5 controller card is installed.

If you have an enhanced //e, put the UniDisk 3.5 controller card into slot 7: If you have AppleWorks on the UniDisk, it will boot. (Actually, it's necessary only to have the UniDisk controller in a slot with a number higher than that of your 5 1/4-inch drive-controller slot.)

Apple never offered a free upgrade from AppleWorks 1.2 to version 1.3. It cost \$20 last spring, but that deal is no longer in effect. If you want AppleWorks 1.3 today, you must pay the full price. The "klugy" solution to putting early AppleWorks onto your UniDisk 3.5 begins to make sense.

Remember, whenever anybody tells you can't do something with your Apple II, you probably can. —P.S.

Product Information

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C & M Manufacturing
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(409) 291-6005
\$99.95 (\$65 each for three)
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21610 Lassen #7
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(818) 709-1721
\$24.95

Reader Service Number 302

Random Routines

When I started programming in assembly language, I came across a problem: I need a way to find random numbers from my assembly-language program. I haven't found any reference to the subject; I tried to write a routine myself, but haven't been successful. Can you explain how I would go about getting random numbers from assembly?

Gregory Gulik
Norridge, IL

It's no surprise that you had trouble writing a random routine for your Apple: you can't. The best an Apple can manage is a pseudorandom number. You can use the Monitor routine KEYIN, and read a true 16-bit random number at \$4E and \$4F: This trick works because the length of time between keystrokes is never the same. It's a slow method and gets you only one number at a time.

Don Lancaster has written a good, fast pseudorandom-integer generator. You can get it—and eight other

routines—in his Assembly Cookbook for the Apple II/IIe (Howard W. Sams).

—P.S.

//c Testing

A friend told me I could check my Apple //c by just pressing the two programmable apple keys, control, and reset at the same time, but he's got a //e. Please tell me how to test my //c.

German Sumbre
Buenos Aires, Argentina

Your //c has so many good things in ROM that Apple had to leave some out—like the Monitor self-test the Apple //e can run. Enhanced //e's and //c's can't run the test. If you have a //e, by the way, you need to use only the solid-apple, control, and reset keys. Sorry.

—P.S.

Happy Memories

I plan to buy a RamWorks RAM card, but I have a question: Applied Engineering says you can use 64K or 256K RAM chips in any combination

on its boards. Catalogs such as *JDR Microdevices* print only the name of the chip, not its memory capacity. Can you buy a RAM chip and plug it into the RAM card? Which RAM chips can you use?

Bob Park
Bloomfield Hills, MI

What's in a name? Everything, if you're talking about RAM chips. The number on your RAM chip ends in either 256 or 64—that stands for 256K or 64K. When you add RAM chips be sure that each bank includes only one chip size—64K or 256K—and that the timing is the same in all chips in one bank. Look for a small number with a dash in front of it on the chip: -15 stands for 150 nanoseconds, -20 for 200 nanoseconds, and so forth. Ideally, each bank should have six chips identical in memory and timing. By the way, expanding your memory this way is a clever idea (for more information, see "Two Roads to Memory Expansion," p. 46 in this issue).

—P.S.

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832k MULTIRAM	266.	239.
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1344k MULTIRAM	449.	-
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When you really want to see how Apple works...

AutoWorks by Alan Bird

(AUTOMATIC AppleWORKS)

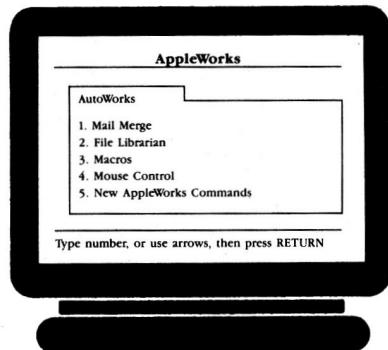
AutoWorks adds to AppleWorks several important time-saving features including mail merge, file organizing, macros, new AppleWorks commands and mouse control.

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.



AutoWorks
\$39.95

FontWorks by Mark Simonsen

Good-looking Printing for AppleWorks

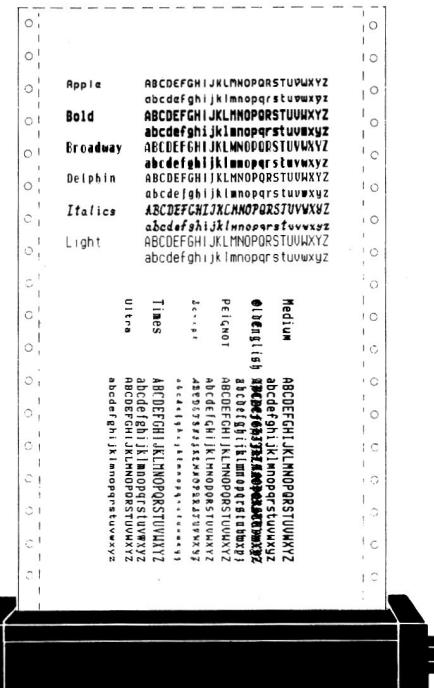
Now you can print your AppleWorks files in a variety of typefaces. FontWorks reads your Appleworks files directly (no need to save them in a different format) and prints them with the typefaces you choose. You can even print your files sideways — great for those wide spreadsheets.

There are no complicated commands to learn. FontWorks incorporates the same easy-to-use menu style as AppleWorks.

Choose from 20 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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REVIEWS

BusinessCard, Fantavision, Battle of Antietam, FontWorks 1.2, Diamond, Quick-20, Challenger, Fixit

Fairly Standard

BUSINESSCARD

Street Electronics, 1140 Mark Avenue, Carpinteria, CA 93013

Multifunction board; Apple II, II Plus, IIe
\$199.95 (serial version)
\$239.95 (parallel/serial version)

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

I waited two months for Street Electronics' BusinessCard: not just the waiting you do for something you know will arrive, but the avid, anxious, anticipatory kind of waiting that precedes the birth of any new high-tech device. I was despondent when it was delayed, and I practically tore the board out of the package when it finally arrived.

The BusinessCard is a multifunction board with two serial ports (a parallel/serial version is also available) and a clock. As do other boards of this type, the BusinessCard uses a phantom-slot technique to assign one of the serial ports and the clock function to two additional Apple slots. Even if no other boards are inserted in these two extra slots, you can't use them for other cards.

That procedure is fairly standard—a term that describes the BusinessCard more accurately than any three dozen handfuls of other words. Yes, Street Electronics has included some very fancy routines in the card's ROM to support a self-contained menu. And you can call up the menu functions almost anytime and activate them from your keyboard or mouse. But that's simply a matter of taking the software that multifunction-card makers supply on disk and turning it into firmware on the card. That's nothing new.

The BusinessCard includes all the usual graphics-printing utilities, such as orientation, sizing, and inverse printing, and it can interface with an impressive number of printers. It doesn't have a snapshot feature

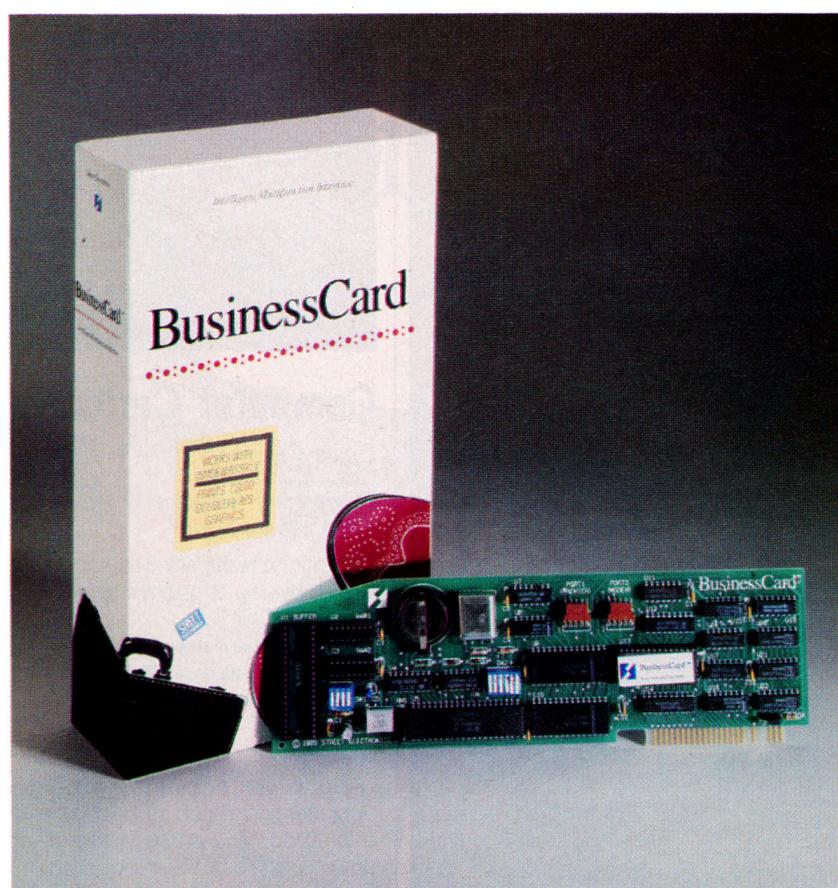
(which dumps the screen to the printer, no matter what program is running). It supports Apple's new ImageWriter II, but I'm sure the manufacturers of older boards will supply upgrades for their multifunction cards.

So what does this card have over the Prometheus VERSAcard and AST's Multi I/O? The on-card software is certainly a nice (if mundane) feature. The serial ports end in Apple IIc-type five-pin DIN connectors, so there's cable compatibility if you have both machines. Street also supplies one DIN-to-DB-25 connector with the board.

Basically we're talking about brand recognition. Street has an excellent reputation in the Apple community for producing quality equipment at competitive prices. And that's the level at which you'll have to make your decision about the BusinessCard. ■

Bill O'Brien
Fort Lee, NJ

Editor's note: Milo Street responds, "Although the BusinessCard uses phantom slotting, the user isn't automatically tied to using two additional



slots." A modified ProDOS (supplied) lets AppleWorks and many other programs read the clock from slot 1, so only programs that look specifically for a Thunderclock or compatible clock require an extra slot. Otherwise, all three BusinessCard functions are available in two slots.

While early BusinessCards came with an ImageWriter I printer cable, current models supply two short cables that mount on the rear of the IIe and connect to IIc printer and modem cables.

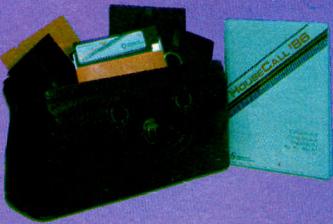
Finally, Street says the card's built-in menu software, far from being "mundane," is "the first to offer double hi-res color screen dumps to the ImageWriter II," along with windowing, magnification, and text-printing features.

inCider's Ratings

Excellent	■ ■ ■ ■
Above average	■ ■ ■
Good enough	■ ■
Not up to standards	■
The empty set	□

REVIEWS

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Computer Cartoons

FANTAVISION

Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101

Animation software; any 64K Apple II with mouse, joystick, or graphics tablet
 \$49.95

Ease of setup

Ease of use

Documentation

Support

Overall

Big screen or small, movies grab our attention much more than still photos do. The same is true in computer graphics. We might admire a good piece of static computer art, but a computer film evokes a sense of wonder and delight.

Until recently, though, making a computer movie required hours of programming or working with difficult animation tools that always seemed to run out of memory right in the middle of your epic. But the plight of the would-be computer-movie artist has been heard.

Broderbund Software has released an exquisite piece of software art called Fantavision. With Fantavision and your mouse (or joystick or graphics tablet), you can generate some impressive films. The ease with which you can create animated graphics and the speed of the animation are, in a word, remarkable. Detailed images move smoothly about the screen, with no flicker. The high quality of the results you achieve with Fantavision is a product of the method of animation the program incorporates.

In standard animation, you must draw individual frames, usually 24 per second of projection time, and with each new frame vary the position of every object you want to animate.

Projecting the completed frames in rapid sequence produces the illusion of motion. This practice is difficult to implement on a computer because of memory requirements and processing speeds. Somewhere in memory your computer must store each object in a frame, and each different view of that object for subsequent frames. And if you're animating a number of objects, the computer can take quite a while drawing each one in its proper spot on the frame, erasing it, then drawing the next object in the sequence.

Scott Anderson, developer of Fantavision, chose another method of animation. Instead of "remembering" each frame of the film, Fantavision needs to know only the first and last frames of a particular sequence. Using a process called *tweening*, your computer automatically creates all the necessary frames (up to 64) between the two you've drawn. Your Apple does this "on the fly," while the program is running, so the animation is fast and the frames use substantially less memory. Fantavision also incorporates a feature called *transformation*, which lets you smoothly change any shape in one frame into some other shape in the next frame.

Making Movies

The Fantavision package consists of a disk with the Fantavision program and several movies you can examine and edit. (The flip side also contains a marvelous demo.) You also get the Fantavision manual, an 80-page booklet that covers the program in detail. Although Fantavision is simple to use, the documentation helps give you a feel for the program and its operation. The last page is a fold-out with a quick-reference chart of the keyboard commands (most of which you can access from pull-down menus) and a labeled diagram of the screen. For those who can't bear reading a manual until after the program is up and running, Fantavision also comes with a "quick-start" card that takes you quickly through a hands-on demonstration.

The work screen contains virtually everything you need in plain sight, easily accessible with a graphics-input device: pull-down menus of editing and disk-drive functions; a "film strip" showing your current location in the movie; and icons representing drawing and shaping functions, color (a total of 56 hues), and animation. This last box contains icons for four types of animation, depending on the effect for which you're aiming: standard;

What the Experts are Saying About RamWorks II!®

"In an informal competition called '640K vs. 640K' AppleWorks running on a RamWorks equipped Apple IIe outperformed Symphony running on an IBM PC."

—*InfoWorld*

"AppleWorks wiped out Symphony... The competition was set up partly to show off another of Wozniak's favorite things, the RamWorks II memory expansion board from Applied Engineering . . ."

—*San Jose Business Journal*

"There are huge differences among the AppleWorks modifying programs sold with the cards. Without doubt, RamWorks II is the most powerful."

—*inCider*

"Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks... I like the product so much that I am buying one for my own system."

—*A+ Magazine*

"RamWorks II is the most powerful auxiliary slot memory card available for your IIe, and I rate it four stars... For my money, Applied Engineering's RamWorks II is king of the hill."

—*inCider*



As you can see, it's easy to tell who sets the pace in Apple memory expansion. In fact, if you read the competition's ads, you'll notice that many even claim to be as good as RamWorks. Some say they're "RamWorks compatible".

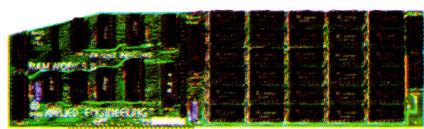
At least they agree on one thing. RamWorks is the one they have to measure up to. But the truth is there aren't any substitutes for RamWorks.

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background, in which the object is "glued" to the background and doesn't move; lightning, for special effects caused by flashing in-between frames; and trace, which leaves the image of an object behind, like a trail.

Fantavision's design presents a few minor problems. First, you can't edit a graphics image pixel by pixel, since Fantavision doesn't work with pixels, but with line segments. The other hitch is that Fantavision uses standard Apple high-resolution graphics, not the double high-resolution available on newer Apple II's.

All in all, though, Fantavision is one incredible package. It's the simplest animation program I've ever used, yet it's so well designed that complex concepts are within easy reach. Plan your designs carefully for best possible results, or at least play a lot before you try anything serious. But Fantavision gives you all the tools you'll need to create outstanding electronic films. ■

Terry Johnston
Wichita Falls, TX



House Divided

BATTLE OF ANTIETAM

Strategic Simulations, 1046 North Rengstorff Avenue, Mountain View, CA 94043-1983

Battle simulation; any 48K Apple II with Applesoft and one drive
\$49.95

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

Saying this may get me into trouble below the Mason-Dixon line, but Robert E. Lee was *not* a military genius. Mostly, he was just smarter—and luckier—than the generals he opposed.

Lee took a few big risks during the war, but he knew that every time he did, he could count on his Union counterpart being unaware of the opportunity or too cautious to take advantage of it. Strategic Simulations' new war game, *Battle of Antietam*, reproduces the situation Lee created when he positioned his army so precariously that the Civil War might have ended three years early—on September 17, 1862.

Union general George McClellan had bottled up Lee's army near Sharpsburg, Maryland, with their backs to the Potomac River and outnumbered two to one. If McClellan had attacked with all his force, he might have annihilated Lee. Instead, McClellan committed only a portion of his men to the battle, and only a corps at a time. Both armies sustained heavy casualties. Lee's gave up minor amounts of real estate, but remained intact. And McClellan did nothing while the Confederates crossed their single ford over the Potomac to safety. The Union had very little to show for the bloodiest single day of combat in American history.

The Union Challenge

SSI's *Antietam* gives you a chance to change the outcome. As the Union or Confederate commander in this battalion-level game, you control every soldier and cannon in your army. Your opponent—a human or computer commander—exercises similar control.

The battle is easy for the Union player to win, if he doesn't opt for "activation." That feature forces him to use units piecemeal the way McClellan did, evening the odds. The Confederate player faces a substantial challenge: surviving an attack by an army twice the size of his own. If the Union general uses activation, the Confederate side can hold its own. If not, the Union player must still demonstrate mastery of tactics and maneuver to win.

Antietam's system of troop movement reflects the realities of warfare 120 years ago. Soldiers march to battle in column formation and redeploy into line of battle. Cavalrymen fight on horseback or on foot. Cannon are "limbered" (attached to horse-drawn caissons), then moved and unlim-

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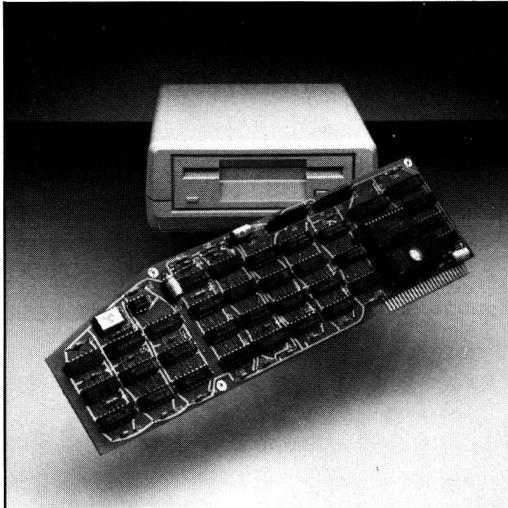
This new controller card combines the functions of 3½ and 5¼ inch drive controllers into one card. Plug in any 5¼ inch disk drive (it supports both old-style 20 pin connectors and //c style DB-19 plugs). Or directly connect an Apple Unidisk 3.5. But most remarkable, the Universal Disk Controller directly accepts Macintosh compatible 800K and 400K external drives.

Unidisk 3.5 compatible

When used with a Mac compatible drive, you still get the identical 800K format used by Apple's Unidisk 3.5—at a considerable price savings. Disks created in Apple's Unidisk 3.5 will work with a Mac drive connected to the Universal Disk Controller and vice-versa. Data Transfer rate is up to par, too. The Universal Disk Controller talks to any drive at full speed.

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You pick what two drives to connect. Plug in two 5¼ inch drives and use it as a standard floppy disk controller. Or connect two Mac drives for a total of 1.6 megabytes of storage. Of course, you can combine drives of different types, too. Connect a 5¼ inch drive and a Mac



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For Apple //+, //e, and Laser 128.

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bered before firing. At the advanced level, units can even build fortifications to strengthen a position.

Antietam's simulation of the effects of terrain also reflects the game's authenticity. The battle was fought in hill country, bisected by a deep creek and broken up by small woods, cornfields, and other obstructions. The game faithfully re-creates these features, along with their effects on sighting, movement, defense, and offense.

Combat is exceptionally detailed. Troops first exchange artillery fire, with the results of the shooting immediately displayed. A phase of volley fire follows. (Rifles have an advantage over smooth-bore muskets, assuming the unit hasn't run out of ammunition.) Next comes the melee, when the formation fixes bayonets and assaults the enemy position.

Announcements of results accompany each phase of combat. The program displays the number of casualties (killed, wounded, and missing) and the effect on the unit as a whole—such as reduction in morale or an increase in

fatigue. A devastating attack can "disrupt" a unit: The unit won't be able to attack and can fire only in its own defense.

Heavy casualties and low morale can also cause a rout, in which a unit flees four spaces and becomes virtually useless except for defense. The outcome of combat may also include a forced retreat without a rout, or the elimination of a unit.

The Taste of Battle

Antietam's graphic depiction of combat and its aftermath authentically reflects a real Civil War battlefield. The realism of battle will astound and satisfy Civil War buffs (such as myself) playing this game for the first time. Even maneuvering units into position and ranging and sighting artillery are thrilling aspects of play. War gamers making their first excursions into a Civil War simulation are in for a delightful, educational surprise.

Battle of Antietam is the first worthwhile Civil War simulation from SSI—or from any other publisher, for that

matter. Every aspect of the game is highly detailed. The result is the most realistic, exciting land-battle simulation SSI has published to date—and that's saying a lot.

One final note: This is the first application of a new game system that will enable SSI to publish high-quality simulations of 18th- and 19th-century battles. Bravo to authors David Landrey and Chuck Kroegel, who are currently working on a simulation of the Battle of Gettysburg. If Antietam is any indication, Gettysburg should be both realistic and exciting. ■

Brian J. Murphy
Fairfield, CT



The Perfect Type

FONTWORKS 1.2

The Software Touch, 9842 Hilbert Street, Suite 192, San Diego, CA 92131

Printer utility and font editor; any Apple II with dot-matrix printer
\$49.95

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FontWorks comes on a "flippy" disk, ProDOS on side 1 and DOS 3.3 on side 2. (The folks at The Software Touch haven't forgotten that many of us use DOS 3.3-based word processors.) And FontWorks isn't copy-protected, so

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you can easily make backups or install the ProDOS version on a high-capacity 3½-inch or hard-disk drive.

Designing Your Document

You have to do a bit of planning if you'll be using FontWorks to print your letters, reports, posters, or brochures. FontWorks gives you a choice of 20 fonts and typestyles, including Broadway, Delphin, Old English, Italic, Script, and even Greek. FontWorks also contains a font editor, so you can adapt an existing font or create your own alphabet.

You can cluster fonts and typestyles into ten font groups, number-coded zero through nine. When you prepare a document with your word processor, insert a backslash and the font number just before the first letter you'd like printed in the chosen style. When you want to change to another font, type another backslash and the new font number.

You'll also have to give some thought to the kind of text file you're going to save. I used AppleWorks, and had to print the file to disk so that FontWorks could interpret it. The FontWorks documentation contains instructions for saving such AppleWorks documents.

A Myriad of Options

FontWorks looks and works like AppleWorks. Those familiar with AppleWorks will immediately recognize the tabbed index-card menu. You make selections by moving a highlighting bar up and down the menu with the arrow keys, pressing the return key accesses the option you choose, and pressing open apple-P prints. But I wasn't able to get open apple-H to work when I wanted to see a list of help features.

Assuming you've properly saved your text file, just start up FontWorks, select the font (or font group) you want, add your text files (you can queue them) to the desktop, and print. FontWorks requires only one disk drive, but you may find it less bothersome if you have two—one for FontWorks and one for your data disk.

FontWorks also offers a number of options in print direction (FontWorks will print spreadsheets sideways), density, and margin width. And you can configure the program for any of a number of dot-matrix printers, including Apple, Epson, C. Itoh, IDS, NEC, Okidata, Panasonic, and Star models. The configuration menu lists 49 different parallel and serial interfaces.

What do you do if the literary genius or ad exec inside you longs for a typesetting machine, but your internal accountant says no to a Mac and laser printer? For a small investment in FontWorks, you can turn your Apple II into an inexpensive, personal desktop publishing system. ■

*Cynthia E. Field
Wakefield, RI*

Play Ball

DIAMOND

Consistent Software, 1050 Duncan Avenue, Suite G, Manhattan Beach, CA 90266

Baseball-statistics utility; versions for Apple II Plus and 64K or 128K IIe or IIc; one drive (printer and second drive optional)
\$69.95

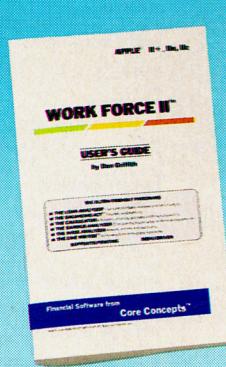
Ease of setup	■■■
Ease of use	■■■
Documentation	■■■■
Support	■■■■
Overall	■■■

As unlikely as it may seem, baseball and computers were made for each other. Baseball thrives on numbers: Baseball statistics form a basis for comparison, aid in evaluations, dictate managerial decisions, and fascinate fans and players alike. And one of the things computers do best is "crunch" numbers.

Diamond, a baseball/softball utility program from Consistent Software, maintains and updates college, high-school, and Little League player statistics. It can also manage administrative information and keep score as games are played.

As a stats keeper, Diamond is unsurpassed. Besides keeping track of players' names and addresses, it can monitor more than 30 offensive, nine defensive, and 26 pitching statistics. With a simple "fill in the form" procedure, Diamond automatically upgrades statistics as you type in individual game or series summaries, virtually eliminating any chance of mathematical error.

Continued on p. 87.



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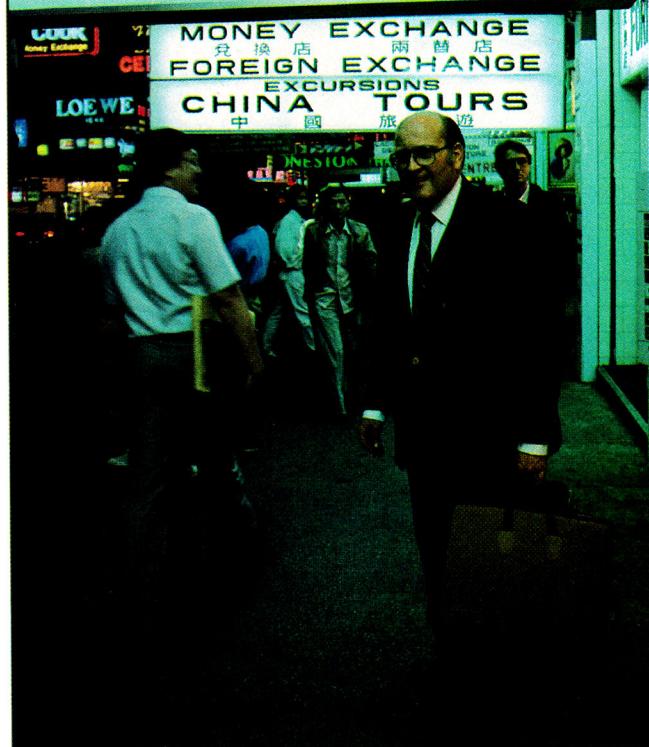
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Zork II



Planning a trip abroad? Take your Apple //c along for the ride—as Jim Munro discovered, it's rugged, reliable, and very portable.



THE //c FROM HERE TO HONG KONG

by James B. Munro

XINKULE (chin-ku-le)! It's a Chinese greeting to a visitor arriving after a long journey. Roughly translated, it means "thank you for going to so much trouble to visit me." Going to China on business can sometimes be a lot of trouble. As businessman Jim Munro says, "If you can't carry it, don't take it!"—it's a law of survival.

Jim Munro spends much of the year conducting business in China as the international sales manager for a company that installs turnkey factories for manufacturing electronic components. His job tests the concept of portable computers: He squeezes his system into the overhead compartments of airplanes, and travels through the streets of Shanghai and Hong Kong with the computer in the front basket of his bicycle, like a businessman's E.T.

The following is Munro's story of why he chose the Apple //c, and how he went about setting up his system.

China-Bound

I needed a portable computer system with a lot of power. It had to handle word processing of 150-page engineering manuals, 60-page legal contracts, form letters, and other correspondence. It had to manage complex

spreadsheets with hundreds of calculations, and readable printouts without a lot of fuss and bother. It had to be small enough and light enough to carry with a large briefcase and garment bag. Lastly, my boss had to approve the cost of the system.

To meet my needs, both the word-processing and spreadsheet software had to be programmable. I wasn't going to have time for boring, repetitive tasks. Besides, sometimes I'm a klutz. With complex contracts and spreadsheets to draw up, I couldn't afford an error when consolidating or copying data, especially with a client looking over my shoulder.

The Alternatives

I looked at the Radio Shack laptop computers, but they weren't powerful enough, and the software available wasn't up to my standards. I also considered the Data General One and Zenith portables: nice, powerful, good software available. But at a cost of \$6000 by the time they're fully equipped, I just couldn't afford them.

The Answer

An Apple //c is at the heart of the computer system I settled on. I added a memory-expansion card to provide a

total of 640K of RAM. Naturally, I also needed a flat-panel LCD. Computing would require portable, uninterrupted (up to eight hours) power, so I selected a battery pack and carrying case. Since I needed hard copy, I chose a lightweight ink-jet printer.

As for software, I needed a sophisticated word processor and a programmable spreadsheet. I also had several spreadsheet files I wanted to transfer from Lotus 1-2-3 to the Apple, so conversion was a prime consideration, too.

Putting this system together wasn't easy. Several dealers tried to steer me toward an IBM or compatible because my application was business. Despite their advice, I remained convinced that the Apple //c is the most affordable machine for businesspeople who need a heavy-duty portable computer.

With my decision made, it was time for the fun part—finding the individual peripherals I would need to make my //c a truly portable system.

Adding RAM

The spreadsheets I use in the course of my work are long and complex, so I knew the //c's 128K wouldn't be enough memory. I added a MultiRam CX card, which brought the memory up to 640K. The MultiRam CX comes with good software and documentation, and seems to work flawlessly. You should have a fair amount of programming skill to make full use of this RAM card, but Checkmate supplies all the information you need. I even wrote custom STARTUP menu programs based on suggestions in the MultiRam documentation—now my colleagues who have no programming experience can use the card.

A Portable Screen

Like most portable computers on the market, my Apple system has an LCD, black characters on a gray background. I chose a C-Vue flat-panel display. It has a knob for adjusting contrast, and you can tilt the screen itself to achieve the best viewing angle.

The display is the standard 24 lines by 80 columns. It's sharp, provided there's a normal amount of overhead ambient light in the room. When the lighting is right, you may find that your eyes are less tired after a long session with the LCD than with a conventional monitor. It's almost impossible for two people to read the screen together, though, because LCD technology is so dependent on viewing angle.

You can permanently attach a bracket to the Apple //c with adhesive, and the display then snaps into the bracket. I leave the display attached. To reduce the chances of damaging the screen, I added two little self-adhesive rubber "feet" to the face of the panel to act as "shock absorbers" when I fold down the display for travel.

The display connects via a short ribbon cable to the //c monitor port, located behind the computer's handle/stand. Repeated flexing may damage the ribbon cable, so you might think of having someone build you a more durable custom cable when your warranty runs out. In the meantime, if you don't want to use the handle, prop the computer on the external clock to allow air circulation for cooling.

Powering Up

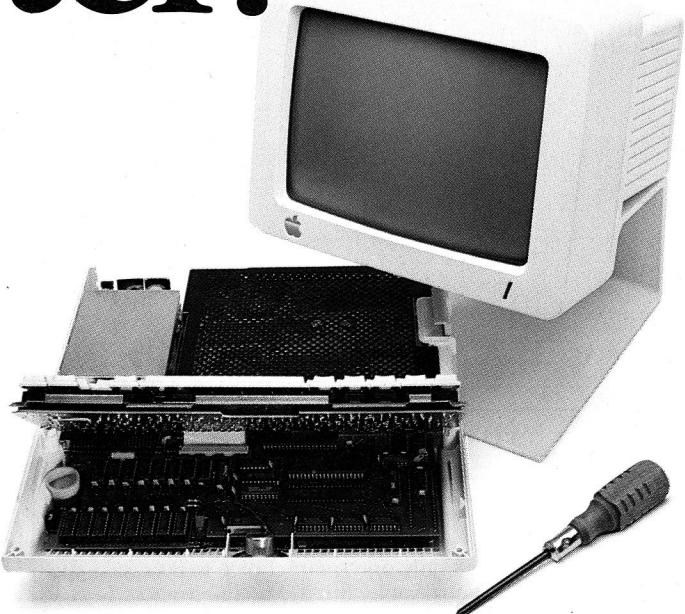
To power the unit, I selected the Prairie Power Pack. Just plug it into a wall outlet, and the battery charges itself or supplies power to run the computer. Each charge lasts about eight hours, and you get a five-minute warning to save your files to disk before the power runs out. The carrying case is attractive and durable.

Portable Printer and Drive

For printing I selected the adequate-but-not-great Epson HS-80 LetterJet, and I have no regrets. It offers quasi-letter-quality type in pica (ten characters per inch), and draft-quality elite (12 cpi) and compressed (17 cpi). Speed is 160 characters per second in draft and 32 cps in near-letter-quality.



Which Apple works better?



With new Z-RAM II installed, the Apple on the right works a whole megabyte better!

A little while ago, the owner of the Apple on the right unscrewed its hood. And in a few quick minutes, he turned his IIc into a whole new machine. With the new 1 megabyte Z-RAM II, Applied Engineering's powerful new version of an already awesome expansion card.



*"I recommend
Applied Engineering
products wholeheartedly."*

*Steve Wozniak, the creator
of Apple Computer*

Now his Apple can completely load programs into RAM — and then store, load and run them up to *30 times faster*. And our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

Turbo Charged AppleWorks.

Even a 256K Z-RAM II can completely load AppleWorks into RAM. With Z-RAM II, AppleWorks responds the moment your fingers touch the keyboard. A 256K Z-RAM II lets your IIc run AppleWorks up to 30 times faster, expands the clipboard, and increases available desktop memory to 229K.

Only Z-RAM II increases the maximum number of records from 1,350 to over 15,000. And only Z-RAM II increases the number of lines allowed in the word processor from 2,250 to over 15,000, provides a print spooler, and auto segments large files so they can be saved on two or more disks.

And for those who crave even more power, Z-RAM is available with 512K, 768K or 1 megabyte of main memory!

Welcome to the world of CP/M.

But perhaps the best news is that Z-RAM II has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC.

Z-RAM II is compatible with all IIc software and hardware, installs easily in just ten minutes with only a screwdriver, is available with memory upgrades up to 1 MEG that can be user-installed at any time. Z-RAM II is easily handled by the IIc power supply with our patent pending power saving design. In fact, a 1 megabyte Z-RAM II draws less power than a 512K Z-RAM.

For fast response.

Z-RAM II comes complete with simple instructions, RAM disk software, Z-80 operating system, CP/M manual, and a five-year "hassle free" warranty.

Make your Apple — and AppleWorks — work better. With 256K Z-RAM II (\$329); 512K (\$389); 768K (\$449); 1 MEG (\$599).

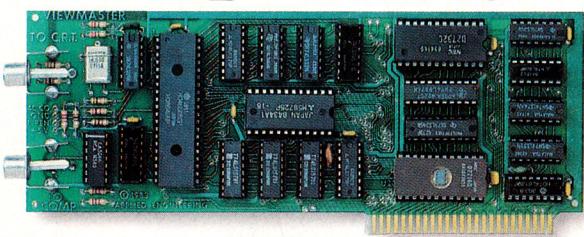
If you want to run CP/M software, but don't need more memory, we suggest our Z-80c card. The Z-80c has no memory expansion ports and is priced at only \$159.

Call 214-241-6060 TO ORDER TODAY. 9 a.m. to 11 p.m. seven days, or send check or money order to Applied Engineering, MasterCard, Visa and C.O.D. welcome. Texas residents add 5 1/8% sales tax. Add \$10.00 outside U.S.

AE Applied Engineering
The Apple enhancement experts.

P. O. Box 798, Carrollton, TX 75006, (214) 241-6060

Now run AppleWorks™ on your II+ and keep full 80 column compatibility!



	BUILT-IN SOFTSWITCH	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN HOME	7 x 3 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERLIDE	INVERSE CHARACTERS
VIEWMASTER 80	✓	✓		✓	✓	✓	✓	✓
SUPRTERM		✓				✓	✓	
WIZARD 80				✓		✓	✓	
VISION 80	✓	✓		✓				
OMNIVISION		✓				✓	✓	
VIEWMAX 80	✓	✓		✓			✓	
SMARTERM	✓	✓			✓	✓		
VIDEOTERM		✓	✓	✓	✓		✓	

One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

Each Viewmaster 80 includes our powerful AppleWorks expand software, allowing AppleWorks to run on the II+ with only 64K (or more) memory. (We recommend the RamFactor memory card, but any compatible Apple memory card will work.) The software provides our full range of AppleWorks enhancements, including expanded records, word processor, multi-disk saving, time and date display on screen with any PRO-DOS clock, and more!

The Viewmaster 80 works with all 80 column applications, including DOS 3.3, PRO-DOS, CP/M, Pascal, WordStar, Format II, Applewriter II, dBase II, Visicalc, Multiplan, and *hundreds* of others—including AppleWorks.

Here are just a few of the powerful features the Viewmaster 80 delivers for a great price (\$139):

- 80 Characters by 24 lines
- Fully compatible with all Apple languages and software
- Highest compatibility with existing 80 column software
- Very low power consumption
- High speed (18 MHZ) scroll rate
- Upper and lower case characters and true descenders, both inverse and normal; all on-screen editing functions are supported
- User-definable cursor shape
- Compatible with Apple II, II+ and IIE
- Five-year warranty

Call today to order or for more information, 9 a.m. to 11 p.m. seven days, or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add 5 1/8% sales tax. Add \$10.00 outside U.S.A.

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The LetterJet includes almost all the usual Epson printer commands, such as super/subscript, italics, boldface, and double-strike. It handles cut sheets or rolls of paper. Use glazed or nonporous paper for clearest print: The ink tends to "wick" on coated stock, such as that used in photocopiers.

In its sales brochure, Epson also claims to offer an optional cut-sheet feeder, but an Epson dealer couldn't show me one. The printer uses friction feed only; it can't handle continuous-form paper, as the carriage isn't wide enough.

Rechargeable nickel-cadmium batteries and a wall-plug charger are built in.

Epson advertises the HS-80 as being available in both parallel and serial versions, but I spent fruitless hours on the telephone with Epson distributors trying to locate a serial model. Using the HS-80 with the Apple IIc requires an interface between the computer's serial port and the printer's parallel port. I selected the Grappler C serial-to-parallel interface. The molded-plastic Grappler converter attaches to the parallel port of the printer, and the plug on the other end fits into the IIc serial printer port. The particular unit I bought wouldn't stay connected on the parallel end unless the clips on the printer were in place. Some selective exacto-knife work bailed me out.

One problem in my application is that the converter box requires power—nine volts DC, according to the manufacturer's specifications. I bought a package of 9V battery clips and a suitably sized coaxial power plug from Radio Shack. Solder the red wire from one of the clips to the center post of the power plug, and the black wire to the outside post. Attach a 9V alkaline battery, and voilà, you're portable again. If you really want to avoid this inconvenience, you might want to consider a portable typewriter with an RS-232 interface.

An external drive is necessary for copying disks; you'll also need one if you use SuperCalc3a Graph, as this module is very disk-intensive. The Pico External Disk Drive is a rugged half-height 5 1/4-inch unit. I don't trust ribbon cable for portable applications, though, so I had a special cable made and added a plug to the drive to make storage a little easier.

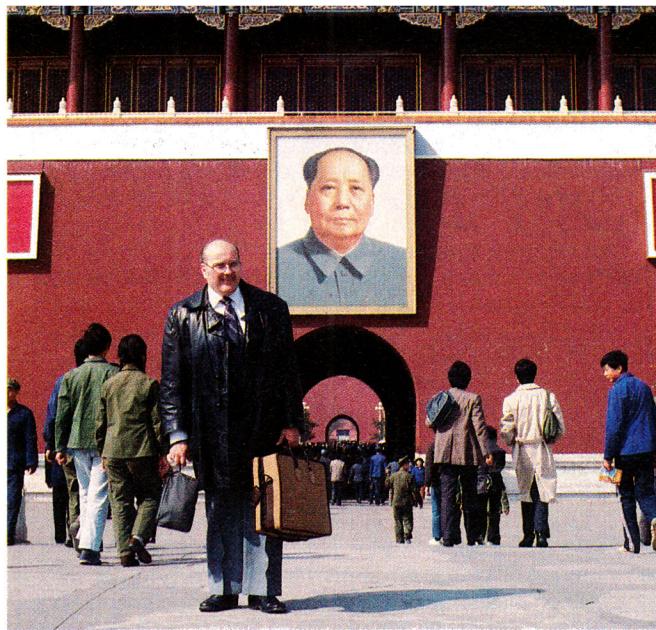
Number Crunching

SuperCalc3a is an excellent spreadsheet, and the database and graphing features look good, too (even though I don't have applications for them yet). The package contains excellent documentation and utility software, including Sideways, a printing utility.

In fact, for my use SuperCalc3a beats Lotus 1-2-3 in terms of the speed with which you can copy and replicate. SuperCalc3a also lets you set column widths to zero, and includes a HIDE/DISPLAY command. You can have your cake and eat it, too: The display and printer both ignore any data (or hidden data) with widths set to zero.

One way to use these features is to print wide spreadsheets a piece at a time. For example, say that column A contains row labels; print A through J as usual. Now set columns B through J to zero width. You can then print A through T, but the printer will ignore the data in columns B through J. Another application is to put all of the formulas and data for cost and profit information in hidden columns; use the same spreadsheet on which you're calculating a price quotation in full view of your client. Afterward, in privacy, you can reverse the process, and the program will have calculated all the costs and profits.

You can preprogram all of these operations with the SuperCalc3a /X command, which execs Apple text files.



Writing these text files, or macros, is easy: Just type quotation marks ("") as the first entry, then press each key in sequence as you would normally to execute a series of commands from the keyboard. Then "output" to disk (save as a text file) the range containing the macro. Since they're ordinary text files, you can edit them with Apple Writer—handy if you want to insert fancy control-code commands.

SuperCalc3a supports the MultiRam CX card, but in an odd way. The additional memory is available for program use, but the spreadsheet doesn't get any wider (66 columns) or longer (240 rows), just more powerful. To add to your aggravation, SuperCalc3a grabs the first 512K it finds (that's all the memory on the CX board), thereby not leaving you the option of using some of it as a RAM disk. The RAM disk would be handy, and even my most complex spreadsheet, which fills the available screen, still leaves about 300K unused.

Perhaps SuperCalc3a's weakest aspect is the way it handles printing ("output to printer"). SuperCalc3a provides minimal default settings for such basics as page size, but not for margins, perforations, and other options you probably want to control. You can manage these functions with printer commands, but you have to know what you're doing (see "The Docile Printer," p. 75 in the February 1985 *inCider*).

Converting from Lotus

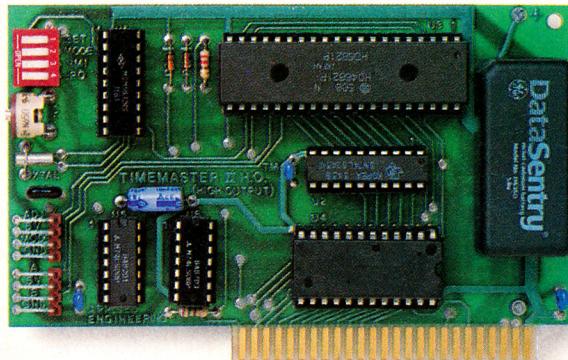
Since I'd already written my spreadsheets with Lotus 1-2-3, I wanted to transfer them to SuperCalc3a on the Apple //c. You must first use a Lotus macro to automatically convert every cell to a literal: Put quotation marks ("") before every formula. Then use the Lotus Translate program to convert the file to DIF format. Now, with a Quadram Quadlink (Apple card) in your IBM XT, convert the DIF file to an Apple DOS 3.3 DIF file. Then convert to ProDOS with the appropriate utility from the Apple ProDOS User's Disk.

Now use the SuperData Interchange Utility that comes with SuperCalc3a to convert your file to the new spreadsheet. Lastly, adjust the column widths to match the original and remove the quotation marks. You have to do a little cleaning up, such as removing the @ symbols (as in @SUM), because SuperCalc3a doesn't use them. It's a lot of work, but it beats the heck out of rewriting and debugging.

Producing Documents

Apple Writer II is, in my opinion, simply the best professional word processor on the market for any computer

Timemaster H.O.TM, the only clock that displays time and date on AppleWorksTM screens and files.



*Now, get all the features of
all the competition combined!*

It's the smart way to put the time and date on your Apple II+® or IIe®. Because only the Timemaster H.O. packs *ALL* the features of all the competition *combined*, including leap year, year (not just in PRO-DOS), month, date, day of week, hours, minutes, seconds and milliseconds. It's totally PRO-DOS, DOS 3.3, PASCAL and CP/M compatible. And of course, it works better than any other clock with AppleWorks.

If you're using or writing software for other clock cards, you're still covered. Because the H.O. will *automatically* emulate them. And the Timemaster H.O. adds 14 new commands to BASIC. The H.O. even comes complete with two disks full of sample programs, including a computerized appointment book, a DOS dating program, interrupt programs, and over 30 programs that others charge extra for—or don't even offer.

As a low-cost option, you can add true BSR remote control to the H.O., giving you remote control of up to 16 lights and appliances in your home or office.

- Fully PRO-DOS and DOS 3.3, CP/M and PASCAL compatible
- Time in hours, minutes, seconds and milliseconds (the ONLY PRO-DOS compatible card with millisecond capability); date with year, month, day of week and leap year
- 24-Hour military format or 12-hour AM/PM format
- Eight software controlled interrupts so you can run two programs at the same time (many examples included)
- Can be set to the second
- Allows AppleWorks to time and date stamp all data automatically
- The only clock card that displays time and date on the AppleWorks screen
- Five-year warranty

Clock price \$129.00
BSR option (may be added later) \$ 49.00

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Your Apple IIc deserves the time of day.



Our IIc System Clock offers automatic time and date stamping, puts time, year, month, date and day of week right on your screen!

Applied Engineering's revolutionary IIc System Clock plugs into either your modem or printer serial port ... and displays the time and date right on the AppleWorks screen. The time feature includes hours, minutes and seconds, and the date includes year, month, date and day of week.

All your work is *automatically* time and date stamped to give you a complete record of your work history. And since it's from Applied Engineering, you'll get our famous no-hassle five year warranty and a price that will persuade you.

FOR JUST \$79, you can give your IIc the time of day, plus much more.

- Fully PRO-DOS compatible
- Automatic time and date stamping
- Easy to use from BASIC
- Date includes year, month, date and day of week
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- Time and date stamps AppleWorks files
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system. Its built-in Word Processing Language makes it programmable, and several cottage vendors (including the author) offer WPL programs if you don't want to do it yourself.

I modified my own software, WPL.AUTO (an Apple Writer enhancement), for use with my MultiRam RAM disk. This software consists of a series of WPL programs that automate file handling, letter merging, mail-list management, and related tasks. It also includes one-key printer-command glossaries for a number of best-selling printers.

You can further enhance your word processing with a good spelling checker. I recommend Sensible Speller—I've purchased probably six versions of this program over the years, and they just keep getting better. For serious writing, a full dictionary is included in two parts of 40,000 words each. Sensible Speller also lets you add an unlimited number of your own terms (technical jargon, for instance). For fastest spell checking of long documents, put the Speller module, dictionaries, and your document all on RAM disk.

Conclusion

I'm certain I'll modify my system as I gain more field experience with it. For the moment, though, I'm delighted with the results. From San Francisco to Narita, Japan, to Shanghai, China, this Apple IIc system has been the most compact, dependable traveling companion I could ask for. ■

Write to James Munro at Box 205, Youngstown, NY 14174.

Product Information

Apple Writer II

Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
\$149

Reader Service Number 303

Pico External Disk Drive

Pico Products
Division of Wayne Green
Enterprises
Route 202 North
Peterborough, NH 03458
(603) 924-9261
\$189.95

Reader Service Number 307

C-Vue

SWI International Systems
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(602) 946-8230
\$525

Reader Service Number 304

HS-80 LetterJet

Epson America
2800 Lomita Boulevard
Torrance, CA 90505
(213) 539-9140
\$499

Reader Service Number 305

MultiRam CX

Checkmate Technology
509 South Rockford Drive
Tempe, AZ 85281
(602) 966-5802
\$199.95 (256K),
\$259.95 (512K)

Reader Service Number 306

Prairie Power Pack

Prairie Power Systems
15500 Wayzata Boulevard
Suite 768
Wayzata, MN 55391
(612) 475-1945
\$269.95

Reader Service Number 308

Sensible Speller

Sensible Software
210 South Woodward
Suite 229
Birmingham, MI 48011
(313) 258-5566
\$125

Reader Service Number 309

SuperCalc3a

Sorcim/IUS
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(408) 942-1727
\$195

Reader Service Number 310

VIP Professional™

The New Generation Spreadsheet For the New Generation Apple® //e & //c

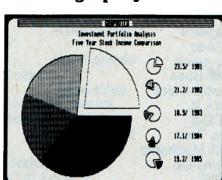
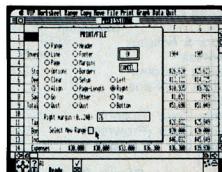
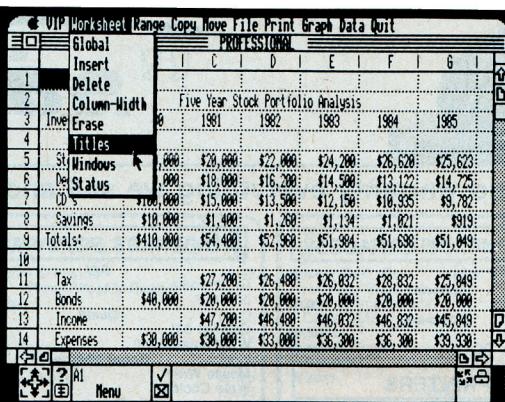
There's an all new Apple //, an Apple // with almost unlimited memory and almost unlimited power—even a new sixteen-bit CPU.* And a *REAL* Macintosh™ style interface is no longer just a dream. It's a mouse click away!

VIP Professional is an all-new program made possible by the new //, and designed specifically for it. Professional brings to the Apple // the most popular, most powerful spreadsheet for any computer—Lotus 1-2-3™ version 1A. But to the integrated spreadsheet, database and graphics of 1-2-3, Professional adds a full-blown Mac-style interface.

Beyond Lotus Compatibility

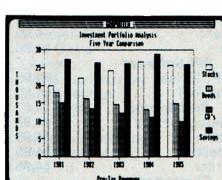
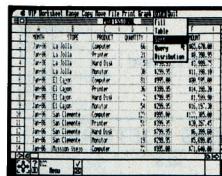
VIP Professional not only has the same commands and features as 1-2-3, you can also type the same keys to do the same things. Lotus files can be read and written, and all functions can be used, including the powerful macros.

But Professional goes beyond Lotus, making it oh so easy to use—and even more powerful. Pull-down menus, dialogue boxes, mouse ranging, scads of icons, scroll bars, column "grabbers", grids—everything you need for ease of use, everything Lotus lacks. Plus, Professional adds things that were left out of Lotus, like a giant 8,192 row by 256 column spreadsheet, and the ability to use up to four megabytes of memory.



lets you automate your spreadsheet for specific tasks such as classroom exercises, experiments, or business applications such as accounting.

Of course you get variable column width, split screens, frozen titles, sorting, data query, file combine and extract, copy, move, range naming, justification for doing business form letters, statistical analysis, a full range of numerical formatting, engineering graphics precision, local and global protection of cells, header and footer control. In short, Professional matches the power of any spreadsheet for any computer!



Professional Power

Don't be fooled by the pretty face. Professional packs a tremendous punch. Like its ability to address up to four megabytes of data; Or its 50-plus built-in financial and mathematical functions; Or its database with up to 8,192 records, each with up to 256 fields; Or its five different types of graphs with tens of options; And its Lotus 1-2-3 macro programming language that

lets you automate your spreadsheet for specific tasks such as classroom exercises, experiments, or business applications such as accounting.

Of course you get variable column width, split screens, frozen titles, sorting, data query, file combine and extract, copy, move, range naming, justification for doing business form letters, statistical analysis, a full range of numerical formatting, engineering graphics precision, local and global protection of cells, header and footer control. In short, Professional matches the power of any spreadsheet for any computer!

Just Minutes to Learn

Professional comes with a user-sensitive tutorial for the newcomer. And help is built right into the program. With the handy tutorial you will be able to create your first worksheets in just minutes.



No Other Spreadsheet Compares

Feature	VIP	SuperCalc3™	Mouse Calc™	AppleWorks™
Sheet Size	256x8192	63x256	63x254	153x999
Usable Memory	4 Meg	500K	42K	61K
Lotus Spreadsheet	Yes	No	No	No
Lotus Database	Yes	No	No	No
Lotus Graphs	Yes	No	No	No
Lotus Macros	Yes	No	No	No
Uses Lotus Files	Yes	No	No	No
Uses Mouse	Yes	No	Yes	No
Uses Icons	Yes	No	No	No
Math Functions	51	49	24	13
Fast Natural Recalc	Yes	No	No	No
Speed	Fast	Fast	Slow	Fast
Supports 16-Bit*	Yes	No	No	No

*Works with but does not require Checkmate and Applied Engineering 16-bit boards.

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SYSTEM REQUIREMENTS: Enhanced Apple //e or //c with at least 256K; Uses ProDOS; Can be used with popular hard disks; Works with MultiRam, RamWorks II & Z-RAM; Apple Memory Expansion Card and AST SprintDisk only work if other memory card added; Mouse and second drive recommended; Double hi-res required; Color monitor required for color features; Uses 16-bit boards with 65C816; Compatible with TransWarp speedup card; To be used, Lotus .WKS files must be transferred to ProDOS diskettes with a communications program.

TWO ROADS TO MEMORY EXPANSION

by Paul Statt, *inCider* Technical Editor

If you're thinking of expanding the memory in your Apple II, ask yourself, will the software I like work with the memory-expansion card I want? The Apple world encompasses two standard ways of adding RAM—auxiliary-slot memory, popularized by Applied Engineering's RamWorks II card, and peripheral-slot memory, Apple's own protocol. If you're an AppleWorks fan, you're in luck: AppleWorks 1.3 recognizes Apple's peripheral-slot Apple II Memory Expansion board without patching, and Applied Engineering's Desktop Expander software loads AppleWorks automatically into RAM.

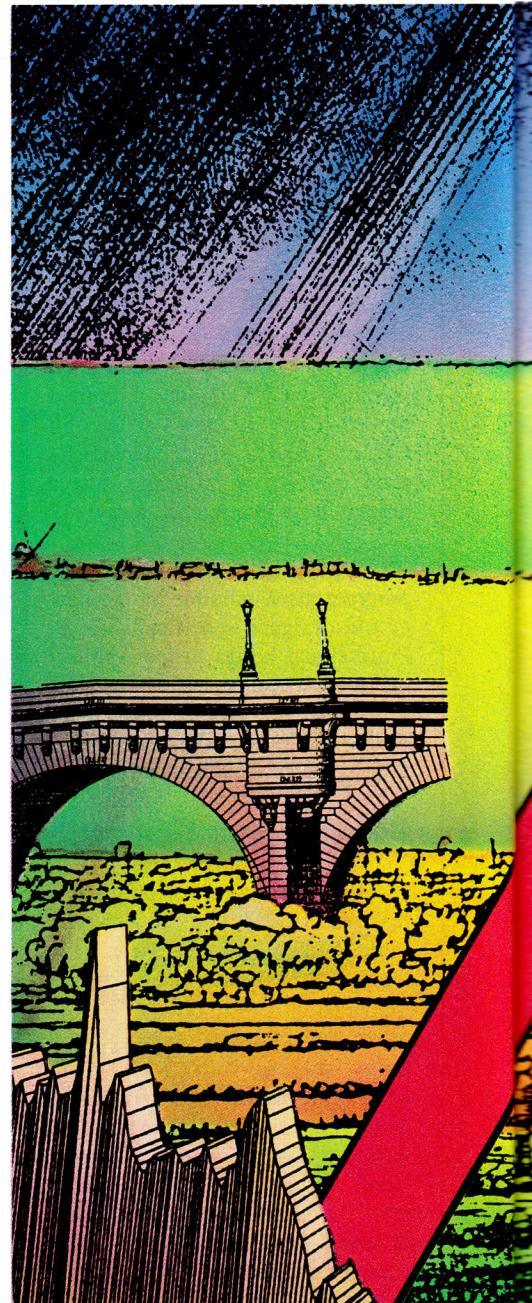
That's the hope of a standard for memory expansion: that *all* memory-intensive software will recognize the peripheral-slot expanded memory of Apple's expected new machine, the "II/x," without patches. As technologically advanced as the Applied Engineering, Checkmate, AST, and Legend RAM boards are, you need memory-expansion software to make them work. And AppleWorks and its accessories (Pinpoint, MegaWorks, and such) are just about the only packages that can take full advantage of auxiliary-slot memory. An auxiliary-slot memory-expansion board is an essential part of my system—but it turns my Apple //e not into a 512K computer, but a 512K AppleWorks machine.

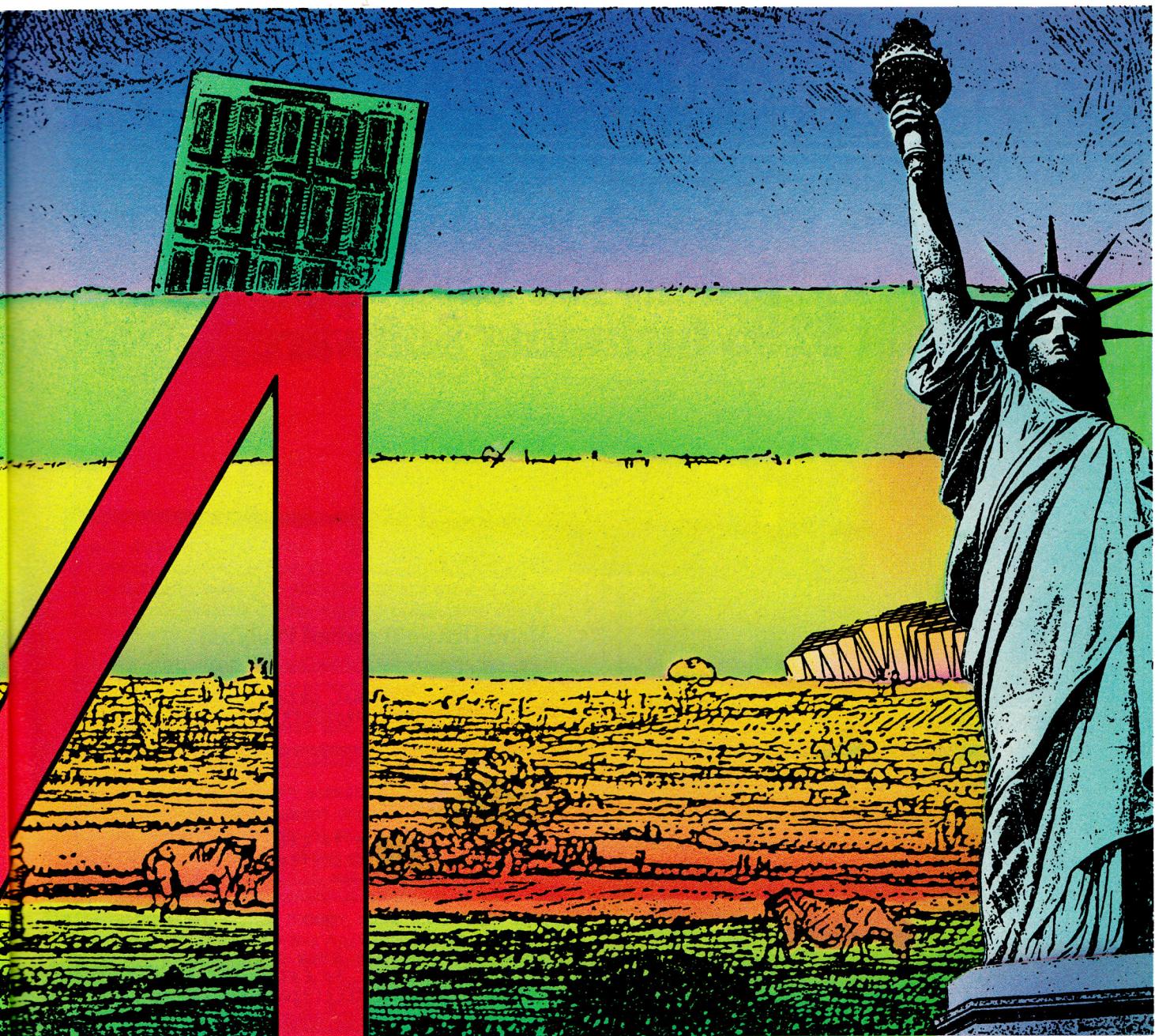
Software Compatibility

The rest of your programs probably use any auxiliary-slot memory in your machine as a RAM disk, not directly. Much software currently compatible with the peripheral-slot standard also accesses the Apple card's memory only as a RAM disk. You get one very fast disk drive, but never actually load these programs into RAM. (See Peter Baum's accompanying sidebar for a discussion of RAM-disk technology.)

For instance, Manzanita Software's BusinessWorks package uses a RAM disk—it makes no difference whether you favor Apple's memory expansion, Applied's, or Checkmate's. The MegaHaus series of AppleWorks extras also utilize either a peripheral or auxiliary RAM disk, as do MouseWrite from Roger Wagner Publishing and International Solutions' Mouse Desk.

WordPerfect from Satellite Software International also uses extra memory as a RAM disk and supports both auxiliary- and peripheral-slot cards. If you don't know how to use a RAM disk, or are reluctant to go through a complicated booting process, SSI offers a preboot disk for Apple, AST, Checkmate, and Legend memory-expansion cards; it configures WordPerfect to look for the RAM disk in your computer's extra memory.

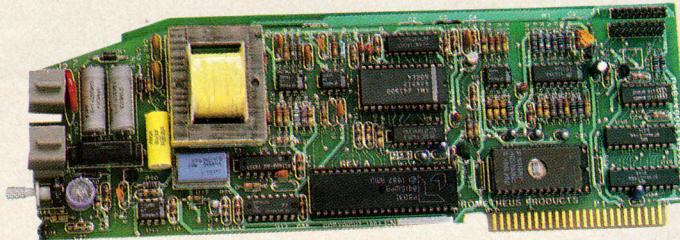




Auxiliary-slot vs. the new peripheral-slot protocol: Which type of memory-expansion card is right for your Apple? The answer depends on your software needs.

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1) BAUD RATE 1200 300
2) DATA BITS 8 7
3) PARITY NONE ODD EVEN MARK SPACE
USE ESC TO EXIT
ENTER SELECTION

1) TYPE XMODEM LINE
2) DIRECTION SEND RECEIVE
3) FILE NAME
USE ESC TO EXIT
ENTER SELECTION

1) PRINTER ON OFF
2) CLOCK ON OFF
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4) KEYBOARD ON OFF
5) CAP LOCK ON OFF
6) ECHO ON OFF
7) LF AFTER CR ON OFF
USE ESC TO EXIT
ENTER SELECTION

The Hot Line

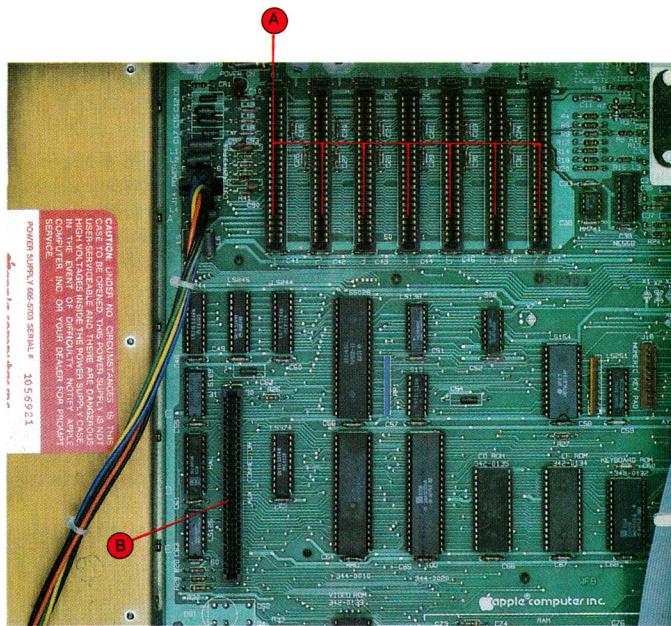


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Boards supporting the newer of the two standards for Apple memory expansion take up one of the Apple's seven peripheral slots (see "A"). Boards that follow the other standard, popularized by the Applied Engineering Ram-Works II card, plug into the Apple's auxiliary slot (see "B").

On the other hand, SuperCalc3a can directly use up to 512K of the Apple memory-expansion card—enough to fill every blank on the spreadsheet. Computer Associates reports difficulty making it work with the Applied and Checkmate boards, though: The problem is the different bank-switching scheme.

Quark's Catalyst program selector and International Solutions' Mouse Calc also support only the Apple card and can use its memory directly or as a RAM disk.

AppleWorks version 1.3 allows expansion of the AppleWorks desktop to 1012K with the Apple card, and can also use the extra memory as a RAM disk. Each auxiliary-memory-card maker, though, must supply its own patch program to expand the AppleWorks desktop.

AppleWorks modified for auxiliary-memory cards is quite different from AppleWorks 1.3. (See Peter Baum's sidebar, "Bank-Switched Memory," for an explanation of the two techniques involved.) For example, Applied Engineering's Desktop Expander program extends the data base to more than 15,000 records and the word processor to more than 15,000 lines, while AppleWorks 1.3 supports only 1350 records and 2250 lines.

On the other hand, a 256K Apple II Memory Expansion card can store approximately 20 percent more data than a 256K RamWorks card. AppleWorks 1.3 allocates more of the expansion memory to the desktop, so if both cards have the same amount of memory, 20 percent more data can be squeezed onto the 1.3 desktop with the peripheral-slot card (assuming that the line or record limits aren't encountered).

RamWorks' Desktop Expander creates a printer buffer with this extra memory not taken by the desktop. It also keeps the time and date on screen if you have a clock card. You can load the entire AppleWorks program into memory during startup with the expander utility.

AppleWorks runs at about the same speed with either the auxiliary or peripheral setup. (Figures quoted are based on tests done by Peter Baum, of Apple Computer's Developer Technical Support Apple II Group, in March 1986, but we caution potential buyers to check with dealers or manufacturers for recent changes in prices.)

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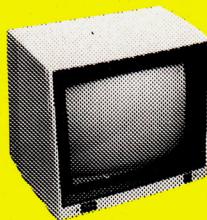
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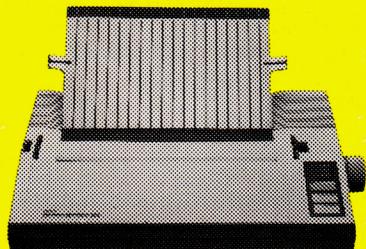


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One advantage of auxiliary-memory cards is that they don't take up an extra slot in your machine: They substitute for the Extended 80-Column Card. This leaves other slots open for disk drives, printers, a mouse, a modem, or other peripherals. With Apple's peripheral-slot memory board, you'll still need an 80-column board.

Auxiliary-slot memory cards sometimes include features not present on Apple's peripheral-slot memory card: 16-bit and RGB options. Sixteen-bit coprocessors are products created with an eye to the future—that is, Apple's forthcoming 16-bit II. No software sold today benefits from a 16-bit Apple coprocessor, though. With the RGB option, you can use that type of monitor without buying another special card.

You can expand either type of card to 3 megabytes—peripheral-slot cards by filling three slots with 1-megabyte cards, auxiliary-slot cards by "piggybacking" cards onto the first one.

A Bigger Tank

Keep this distinction in mind: If storing a large number of records is more important to you than having a big program in RAM, you need a hard disk (around 10,000,000 bytes of storage) or a compact 3½-inch disk drive (about 800,000 bytes per disk), not a RAM card. If it's speed you're after, you need an accelerator card that forces the 6502 to work faster.

Peter Baum has said that expecting a memory-expansion board to speed up your microprocessor or store more records is a little like expecting a bigger gas tank to make your car drive faster and seat six more adults. The larger gas tank means you stop for gas less often; expanded memory for the Apple II means your programs go to the disk less often. Remember that no RAM-expansion scheme can increase the size of your storage space or accelerate your microprocessor. ■

Bank-Switched Memory

Bank switching squeezes more memory out of less computer. It's a trick common to all kinds of Apple II memory expansion: Apple's 128K Extended 80-Column Card, RamWorks II, Apple's Apple II Memory Expansion card, MultiRam //e, SprintDisk, MegaRam Plus, and all the rest.

A microprocessor accesses data and programs from memory by referring to the "location" in which each character is stored. It's like sending mail to an address, and in computerese, the location is actually called the *address*. Each address must be unique in the same way your mailing address must be unique. If not, you'll get somebody else's mail.

The 6502 microprocessor in the Apple II can reach 65,536 (64K) addresses at a time. It can use more than 64K, but only 64K at one time. If it needs to read data outside this 64K address space, called a *bank*, it must switch in the appropriate bank of memory before reading the data.

A very common use of bank switching in everyday life is the phone system. If you dial seven digits, you get a phone in your local area code that responds to that number. But if you dial ten digits, you'll get another phone in a different area code. For example, you can get Information anywhere by dialing 555-1212 preceded by the appropriate area code. The area code does the bank switching.

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Extended 80-Column Card, \$100
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Cupertino, CA 95014
(408) 996-1010
(see our review of the II Memory Expansion board in this issue, p. 54)

Reader Service Number 311

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Legend Industries
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(see our review in the December 1985 issue, p. 18)

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(see our review in the June 1986 issue, p. 29)

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MegaRam Plus, \$195
(64K)-\$745 (1M)
SprintDisk, \$295
(256K)-\$745 (1M)
AST Research
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Irvine, CA 92714
(714) 863-1333
(see our review of the SprintDisk in this issue, p. 54)

Reader Service Number 314

MultiRam //e
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(768K)
(see our review of MultiRam RGB-\$199.95 with 64K, \$439.95 with 1M-in this issue, p. 54)

Reader Service Number 315

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Applied Engineering
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Carrollton, TX 75006
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(see our review in this issue, p. 54)

Reader Service Number 316

RAM-Disk Storage

Your favorite program may not fully recognize any memory-expansion card, but it may still be able to utilize the extra memory in one way: RAM-card manufacturers provide utility programs that let your computer treat the additional memory as a RAM disk.

A RAM disk is a "phantom" disk drive—to an operating system such as ProDOS, it looks like a physical drive. You can write and read files on a RAM disk just as you would on a 5½-inch floppy drive. For example, ProDOS' BASIC.SYSTEM automatically configures the extra 64K of memory on Apple's Extended 80-Column Card as a 60K RAM disk. (The missing 4K stores the program that makes the memory a RAM disk.)

To watch a RAM disk in action, copy some parts of ProDOS to the 80-column-card ProDOS RAM disk with the help of a file-utility program such as the ProDOS Filer. For example, copy either FILER or BASIC.SYSTEM to /RAM, then run the program (from the FILER, choose QUIT and type /RAM/filename). Notice how quickly the new program leaps onto the screen.

Be careful using the built-in ProDOS RAM disk (/RAM) on the Extended 80-Column Card. Programs that utilize more than 64K, such as AppleWorks, will clobber the RAM disk while running and destroy data and files.

RAM disks speed up file reading and writing. But they don't store data permanently—turn off the computer and the data disappear. Saving to a RAM disk isn't the same thing as saving to your physical disk; if the power fails or the system crashes, your data will be erased beyond recovery. But RAM disks are particularly useful for holding programs, since they're already stored permanently on physical disks—and a single RAM disk is spacious enough to contain several programs. □

—Peter Baum

Auxiliary-Slot Protocol

Cards that plug into your Apple's auxiliary-memory slot mimic the design of the extra 64K you can add to the Apple //e with the Extended 80-Column Card. Apple developed a protocol for accessing this extra 64K, and most popular programs today follow it. To make software development as easy as possible, Applied Engineering and other developers designed their cards to conform to the original Apple standard instead of trying to invent a new convention.

The memory in the auxiliary cards is broken into multiple 64K banks. A special location keeps track of which bank your computer is currently using. Each 64K bank shares your Apple with the memory that resides on the Apple //e motherboard in the same way the 64K on the Extended 80-Column Card does.

Cards following this protocol include Applied Engineering's RamWorks II, AST Research's MegaRam Plus, Checkmate Technology's MultiRam //e, and Legend Industries' E' Card.

Peripheral-Slot Memory Expansion

Apple decided that auxiliary-slot protocol was too complicated and set about to design a new technique that would be simpler for software developers.

It can be argued that Apple's peripheral-slot memory card also requires bank switching to access the memory. In this case, though, the card bank-switches a single byte at a time.

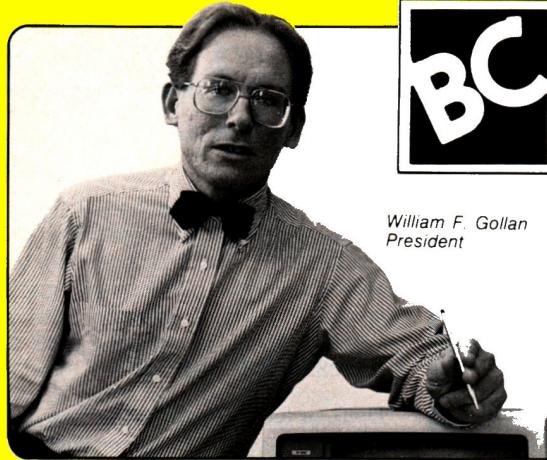
But Apple "strongly recommends" that programmers treat the memory on the card as a block-storage device accessed through the Protocol Converter (motherboard firmware containing the routines that actually accomplish the bank switch), and not write directly to hardware locations (include the bank-switch routines in the program).

Apple suggests this standard to ensure software compatibility with future hardware configurations. Software that follows this recommendation should be compatible with upcoming Apple II's and peripherals. Since auxiliary-slot memory cards don't adhere to this protocol, we can assume that software that accesses extra memory directly won't work with this new Apple equipment.

Under Apple's peripheral-slot scheme, developers can think of the memory as a single, large, contiguous data area, to make programming a lot easier: You don't have to program in the bank addresses—the Protocol Converter takes care of it for you. A program can't execute code from the expansion card, though, but must first transfer it to the Protocol Converter motherboard memory, and that takes some extra time. It also takes time to access small chunks of data spread throughout the card and take the extra step through the Protocol Converter firmware.

Cards supporting this peripheral-slot protocol are Apple's Apple II Memory Expansion card, AST's SprintDisk (switch-hitting here), and Cirtech's Flipster. □

—Peter Baum



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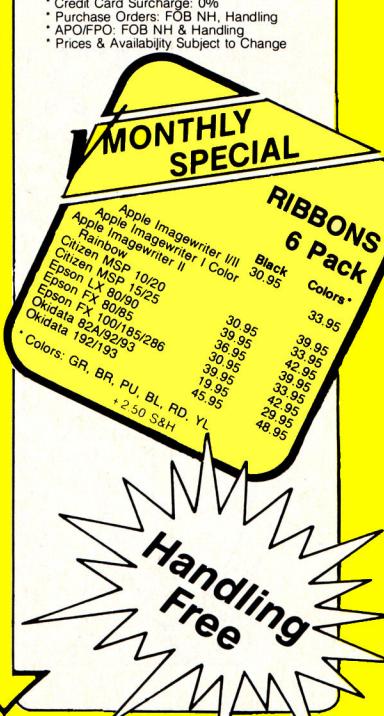
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FOUR LEADING CHOICES

inCider's hardware guru compares four popular memory-expansion boards.

by Bill O'Brien

Beset by the 64K limits the 8-bit 6502 processor imposes, early Apple II users were confined to small program and work environments. With the //e and //c series, Apple Computer bumped that limit up to 128K. While the 6502 still can't address more than 64K, a clever technique called *bank switching* lets that memory potential expand (see "Bank-Switched Memory," p. 50, for details).

Bank switching is akin to the function of a lazy Susan—while never changing position, it provides you with a multitude of storage trays by rotating its compartments.

It's not difficult to imagine that if you can bank-switch 64K of memory, it should be relatively easy to do the same with larger amounts. That thought seems to have occurred to a few hardware manufacturers, Apple included, and we now see 1-megabyte (and larger) expanded-memory cards on the market.

With that in mind, I've drawn up a brief comparison of four memory-expansion boards (for manufacturer and price information, see the Product Information sidebar on p. 51): Applied Engineering's RamWorks II, Apple's Apple II Memory Expansion card, the AST SprintDisk, and the MultiRam RGB board from Checkmate Technology. They fall into two distinct categories: those you install in the auxiliary slot that come with their own memory-management software, and those you can place in any peripheral slot (except 3—and only in 4, 5, or 6 if you're using Pascal) and utilize ProDOS' built-in memory management (for details, see "Two Roads to Memory Expansion" and its two accompanying sidebars, pp. 46-51).

From a purchaser's point of view, your main consideration might well be the condition of your Apple. If your system is up and running and already equipped with an extended 80-column card (or RGB color interface), the Apple and AST products might appeal to you: You wouldn't have to yank out an existing auxiliary-slot board. On the other hand, the Applied Engineering and Checkmate boards are prime candidates when you're configuring your system at the time of purchase. They each have expansion capabilities that will let you add to your machine as your needs increase without making your current equipment obsolete.

As for which board within each group is the better purchase, consider support and repair facilities. That's how fine the distinctions are between boards in the same category.

RamWorks II

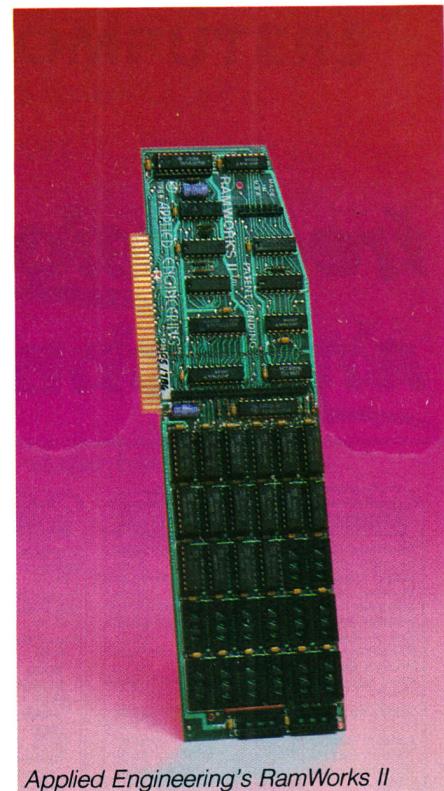
RamWorks II is expandable on board to 1 megabyte. It has built-in 80-column support and plugs into your //e's auxiliary slot. You can connect a daughterboard that expands its memory by as much as 3 megabytes. Another card adds an RGB color interface. What could be better?

As it's easy to play armchair hardware designer, I do have some criticisms. With version 1.2 of Apple's System Utilities, you no longer have a RAM drive (at least, I couldn't find it), although the RamWorks documentation claims you should. There's no other automatic RAM disk because the card is in the auxiliary slot. And AppleWorks 1.3 loads in with only a 55K desktop, despite the 1-megabyte RamWorks II.

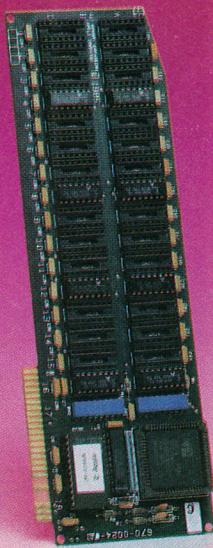
Applied Engineering uses an older approach to managing memory. Essentially, RamWorks ignores your Apple's memory-management routines and uses its own. That's not bad. They include RAM-drive creation utilities, either bundled or optional, which will give you DOS, ProDOS, CP/M, or Pascal RAM disks. They modify AppleWorks to access almost all of the RamWorks board's memory (a portion is reserved for backfill to bring your system up to 128K). Part of that modification lets AppleWorks prompt you for multiple floppies if you're storing a particularly large data file. AppleWorks even loads and runs automatically from within RamWorks memory, so swapping program segments is faster, too. And even though Applied Engineering ignores Apple's state-of-the-art technique, that doesn't mean the RamWorks card isn't efficient and useful.

Unfortunately, RamWorks memory-expansion software doesn't recognize ProDOS pathnames. Since I run AppleWorks on my Sider II hard disk, I can't judge how well RamWorks performs with that package. Applied Engineering's modification utility asks me to insert my AppleWorks start-up disk into drive 1. My Sider won't fit.

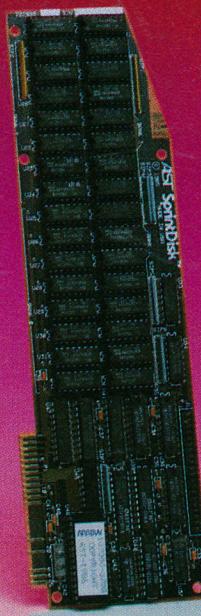
I'm sure I could modify a copy of an AppleWorks start-up disk, then transfer it to my hard disk, but I wouldn't



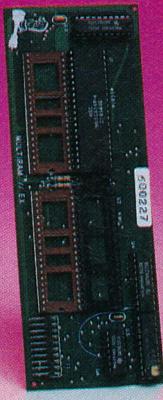
Applied Engineering's RamWorks II



Apple II Memory Expansion



AST's SprintDisk



Checkmate's MultiRam //ex

have to if Applied Engineering would just recognize ProDOS pathnames for the installation. And I'm too set in my ways to return to techniques that were necessary when everything on the Apple II had to be patched to work correctly.

Apple II Memory Expansion

Although it lagged in production of its own 80-column card, Apple was one of the first to announce a memory-expansion board for the //e. It's sold with a minimum of 256K installed and can be placed in any slot except the auxiliary connection and slot 3.

A year ago, the 1-megabyte RAM capacity of this card would have made it outstanding. It's merely in the ballpark right now (Apple's own products have always sparked development of new devices for its computers). It's among the shorter of these four RAM cards, though, because of a single very large-scale integrated (VLSI) circuit that replaces up to 12 ordinary TTL chips. Apple has also included ROM support that lets ProDOS and Pascal automatically recognize the card as a RAM disk if your software doesn't use its expanded memory.

SprintDisk

From a strictly hardware standpoint, the SprintDisk is almost a duplicate of the Apple II Memory Expansion card—but there are some very important exceptions. Although limited to 1 megabyte on board, there's a piggy-back connector for a daughterboard (no slot required) that can add an extra megabyte of RAM.

There are no VLSI chips on the SprintDisk, but it does have on-board RAM-disk support in ROM. You can also format it under DOS as two 400K RAM-disk volumes (with 1 megabyte installed). And AST has added some special software you can use to solve other inherent Apple problems.

This software turns the SprintDisk into a cache system. Caching is a way of buffering input and output from slower devices, such as disk or tape drives, or even a hard disk: The software loads a large amount of informa-

tion into cache memory, even if you ask for only a little. For example, an entire volume is "cached" when you transfer one file. On successive searches, your computer looks for the requested information in cache memory first. If it finds your data there, the access speed is as fast as RAM permits. If not, the software retrieves your data from disk and transfers additional data from the file to cache in preparation for your next request.

There's one drawback to AST's cache software, though. While it can speed up disk access considerably, the SprintDisk no longer functions as expanded memory under AppleWorks 1.3. Of course, with two SprintDisks you can select one for cache and the other for memory.

MultiRam RGB

The MultiRam RGB card is an auxiliary-slot board with built-in 80-column and RGB-color support. Its memory is expandable to 1 megabyte on board, or 6 megabytes with daughterboards. (Other Checkmate expander boards are available, as well, even one for battery-backed static memory expansion and one with a 65C816 processor, called the MultiRam //ex card.) Like RamWorks II, it needs special software to manage memory for AppleWorks.

Likewise, you can't access all of the board's memory. Some of it is reserved to hold AppleWorks program segments and as backfill to bring your system up to the 128K needed for 80-column and double hi-res support. But you can specify a pathname containing your AppleWorks programs, so hard disks work simply. Checkmate's installation software also modifies AppleWorks to let you load any or all of the program segments into the MultiRam card. It also prompts you for multiple floppies if the amount of data you're saving is larger than the amount a single floppy can hold. ■

Write to Bill O'Brien at P.O. Box 1010A, Fort Lee, NJ 07024.



WHAT'S GOING WRONG IN CLASSROOM SOFTWARE?

The battle between teachers and vendors over pirated classroom software rages on. What's the solution? A dialogue between the warring parties may be the first step toward resolving the issue.

by *inCider* staff

Teachers need classroom software, so many copy it—illegally. And that means developers sell less, so they stop investing dollars in new classroom software. The result: Teachers complain of not enough good classroom software. They're right. Vendors complain they can't make money selling such software. They're right. So everyone loses? Wrong.

Solutions exist, but they're not easy. Some feel that a legal suit against a school would serve to stem the piracy problem by setting an example for everyone who copies. Others urge better education on the subject of piracy and its ramifications. And more creative distribution of software through site licensing (an agreement under which the vendor permits multiple copies at a much lower price) might also help alleviate copying, others say.

But all agree the solution will be discovered only if all groups involved work it out together. Urges David Summer, a junior-high-school teacher and software developer in Scotts Valley, California, "We need to start a dialogue between teachers and vendors. This would make teachers realize what goes into software development and would give vendors a better understanding of what needs to be developed for the classroom."

How Much Piracy?

The scope of software piracy in schools is difficult to judge, says Anne Wujcik of the Talmis research group of Link Resources in New York, because teachers are beginning to clam up on the subject. "No one has a number, although you hear speculations that anywhere from 10 percent to 50 percent of the software in the schools is illegal," Wujcik says. "We can't document the extent of it; we just know it's happening."

Vendors obtain solid evidence of copying through a number of channels. For example, Dr. Donna Craighead of DLM Teaching Resources in Allen, Texas, tells of cop-

ied software disks users have sent back to the company when they encountered problems! Phillip Thompson of Heath/Collamore in Lexington, Massachusetts, relates that on field trips to schools he has encountered illegally copied disks of his company's programs, an experience many vendors appear to have shared. Others talk of receiving praise-filled letters from teachers who live in districts where authorized sales representatives have never ventured.

Carol Bunevich, marketing director at Scholastic Software in New York, points to surveys she has seen that list copy-unlocking programs as the most popular software sold to the school market.

Summer recalls an incident three years ago that involved a high-school student in a neighboring district. An administrator gave the teenager time off from school to make illegal copies of software for the school district.

"I don't think that would happen today," Summer observes, "but it illustrates how widespread the ignorance in this subject has been."

Of course, the most dramatic way to judge the extent of illegal copying is to watch the developer's bottom line. Software publishers don't get a good return on their educational products, they say. Almost everyone agrees that the ultimate price of piracy will be its depressing effect on the quality and quantity of good educational material.

Developers such as Dick Cummins of Writing Software International in Missoula, Montana, suspect that piracy may actually drive some small software shops out of business and cause larger companies to divert their development dollars to other markets. Others, such as Jan Davidson of Davidson & Associates in Torrance, California, say that while illegal copying may not single-handedly bring a company to its knees, piracy certainly can be "the straw that breaks the camel's back."

"We believe some of the more innovative developers are discouraged about putting their efforts into the school market

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Carol Bunevich of Scholastic Software: "We believe some of the more innovative developers are discouraged about putting their efforts into the school market because of piracy."

because of piracy," Scholastic's Bunevich says. "The end result will be that quality suffers." She observes that Scholastic has "deep pockets" and so can afford to weather the current storm of confusion in the marketplace, but some smaller companies may not be able to wait it out.

"It's ironic," says John Paulson, chairman and chief executive officer of Springboard Software in Minneapolis, Minnesota. "Teachers who copy software are draining away the research and development dollars that would go to develop better products for the school market. They don't realize how shortsighted they're being, nor the impact these actions will have on their future."

Why Illegal Copying?

The problem of copied software is the visible tip of a deeper problem: painfully meager budgets for school supplies. Lack of ample dollars for school materials has long caused desperate teachers to turn to photocopying workbooks and other printed material to meet classroom needs. Most vendors understand that it's in the same spirit that teachers copy software.

"I believe print materials are probably far more copied than software, but for some reason the software community feels more violated than the print publishers," says Steve Rasmussen of EduSoft, a Berkeley, California-based firm that pioneered site licensing for schools. "We at EduSoft understand the plight of the teacher, because almost all of us have been teachers at one time or another. I know how hard it is to get approval for more than one copy of a software package."

Educators readily admit that too little money aggravates the piracy problem. Peter J. Schaefer, a high-school teacher from Maryland, explains that software is written for individual use, but classrooms require group participation. It's impractical, he says, for many schools to make up the difference. Meanwhile, schools are under increasing pressure to let students use software.

"The issue that hangs up many teachers is that they're not copying for profit, but to try to outfit their classes," Schaefer says. "Americans make copies on their videocassette players, on tape cassettes, and on xerox machines, so copying is very much a part of our culture."

On the other hand, Schaefer acknowledges a weakness in this logic. "Carried to its extreme, this kind of thinking would say to a driver-education teacher that it's all right to steal a car so that his students can learn to drive," he admits. "Technically, a school doesn't have the right to make copies, but I understand why teachers are having a tussle over it."

Most vendors understand it, too. They know all too well the budgetary plight of the teacher, because most of them have also spent time as educators. But they're unwilling to continue turning a "blind eye" to the problem.

"I think it's positively shocking for a teacher to copy software," asserts John Paulson, who was a high-school music teacher before turning publisher. It's like taking a group of children on a field trip, he says, and stopping along the way to shoplift in front of them. "Think of the example they're setting!" he says with indignation.

Software vendor Cummins also agrees that lack of funds doesn't justify theft of intellectual property. He recalls that in 1973 he had a budget of \$76 for the school year when he taught writing at Key West High School in Miami, Florida. But he didn't solve his problem by pilfering books from the local bookstore. Instead, he took up a collection among his students, which he supplemented from his own salary, and bought used books that could be passed around the room.

Solutions Needed

Many vendors hope that as teachers become more educated about the problem, they'll voluntarily curb illegal copying. The consensus among these developers is that teachers are responsible people who care about doing the right thing and setting the proper example for those in their charge.

"Their hearts are in the right place," says Paulson, speaking for many of his colleagues.

Education will also help by letting teachers know that copying really is illegal. Some think it's illegal only when the copy is sold. "More education about the problem is needed, because most teachers still don't understand at what point they're breaking the law," says software developer Rasmussen.

Others are concerned that nothing short of legal action will put a stop to the drain on development dollars. Ken Wasch, head of the Software Publishers Association in Washington, D.C., has taken steps on Capitol Hill to make the federal government more aware of the problem, including requesting that the F.B.I. train more agents in the prosecution of software piracy.

"If we had an ironclad case, we wouldn't hesitate to go after a school district," says Wasch, whose organization plans an intensive campaign this year to awaken the educational community. Wasch acknowledges that many teachers still don't understand they're breaking the law.



Jan Davidson of Davidson & Associates: "Cheaper prices aren't the answer. The lower the price, the more the user may feel he's doing nothing wrong."

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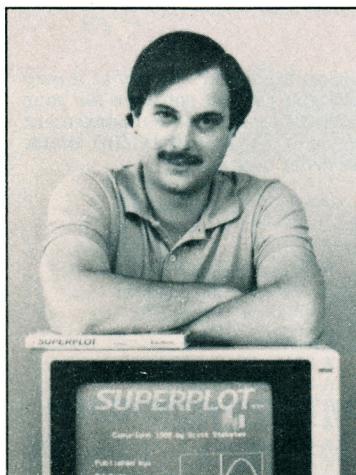
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Steve Rasmussen of EduSoft: "More education about the problem is needed, because most teachers still don't understand at what point they're breaking the law."

And he notes that schools often add to the temptation to copy by allocating all their "computer" funds to hardware, leaving nothing in the pot for software.

Cummins urges developers to "encourage organizations like the Software Publishers Association to bring suit against a school. This would help educators realize the seriousness of piracy," he says.

And finally, teachers say software vendors must better understand their needs. Developers need to recognize that teachers have small budgets and need lots of software at reasonable prices, they insist. But just making software less expensive won't solve the problem. The need for several copies of the same item must be addressed.

"Cheaper prices aren't the answer. In fact, the lower the price, the more the user may feel he's doing nothing wrong," comments publisher Davidson.

Vendors need to learn to market software in a way that corresponds to the teacher's need for multiple copies, urges Ed Porter, a Santa Cruz, California, high-school teacher. "More network software would be a tremendous help and would make more sense to us than individual floppies," he adds.

High-school teacher Schaefer agrees that getting multiple copies of software cheaply would help alleviate piracy. He says teachers should encourage vendors to provide better on-site licensing and leasing agreements and lower-priced programs. "Most software is still not designed for the classroom setting, nor does it take into account the school's budget," he says.

It's obvious that answers to the problem of illegally copied software in the classroom aren't easy to find. As one teacher puts it, "You can't squeeze blood out of a turnip, nor can you pay for software if you don't have the money." Budgetary constraints aside, educators have long copied other types of materials for their classes and so are baffled at the hoopla over software. Furthermore, the very nature of the technology lends itself to program duplication.

The genuine desire of teachers to "do the right thing," though, may be the force that ultimately resolves the piracy issue. Most vendors are counting on it. But unless it's settled soon, teachers may find less and less good software from which to choose—a sad affair that would hurt the nation's children most of all. ■

Product Information

In 1985 Link Resources of New York surveyed a national group of school district-level microcomputer coordinators to learn which software packages they found most valuable in the classroom. The following programs are ranked according to frequency of mention.

1) Bank Street Writer

Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(415) 479-1170
\$69.95

Reader Service Number 317

Scholastic Software
PFS:Write, File, Report,
\$99.95 each
Graph, \$134.95
Plan, \$119.95

Reader Service Number 324

5) The Print Shop

Broderbund Software
730 Broadway
New York, NY 10003
(212) 505-3000
\$49.95

Reader Service Number 325

6) The Factory

Sunburst Communications
39 Washington Avenue
Pleasantville, NY 10570
(914) 769-5030
\$59

Reader Service Number 326

2) AppleWorks

Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
\$250

Reader Service Number 319

3) Logo

Apple Computer
\$100

Reader Service Number 320

7) Math Sequences

Milliken Publishing
1100 Research Boulevard
St. Louis, MO 63132
(314) 991-4220
\$695

Reader Service Number 327

LogoWriter

Logo Computer Systems
555 West 57th Street
New York, NY 10019
(212) 765-4780
\$395 (program and site license)

Reader Service Number 321

8) Magic Slate

Sunburst Communications
\$99.95

Reader Service Number 328

9) Apple Writer II

Apple Computer
\$149

Reader Service Number 329

Networked Logo

Terrapin Software
222 Third Street
Cambridge, MA 02142
(617) 492-8816
\$339.95

Reader Service Number 322

10) MicroType: The Wonderful World of Paws

Southwestern Publishing
5101 Madison Road
Cincinnati, OH 45227
(513) 271-8811
\$39.95

Reader Service Number 330

4) PFS:Write, File, Graph, Calc, Plan, Report, Access

Software Publishing
1901 Landings Drive
Mountain View, CA 94043
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\$125 each
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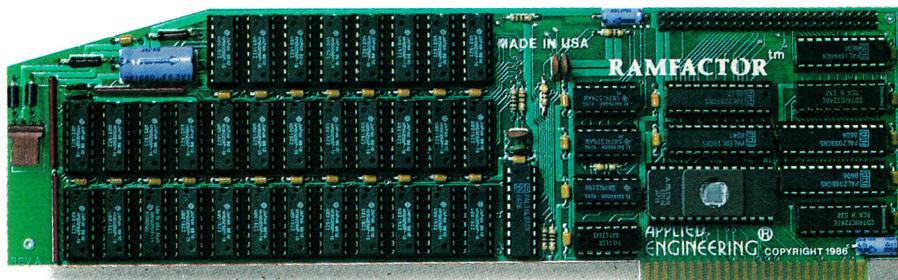
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There are other slot 1-7 cards that give AppleWorks a larger desktop, but that's the end of their story. But RamFactor is the only slot 1-7 card that increases AppleWorks internal memory limits, increasing the maximum number of records in the database and lines permitted in the word processor, and RamFactor is the only standard slot card that will automatically load AppleWorks into RAM dramatically increasing speed and eliminating the time required to access the program disk, it will even display the time and date on the AppleWorks screen with any ProDOS clock. RamFactor will automatically segment large files so they can be saved on 5 1/4", 3 1/2", and hard disks. All this performance is available to anyone with an Apple IIe or II+ with an 80

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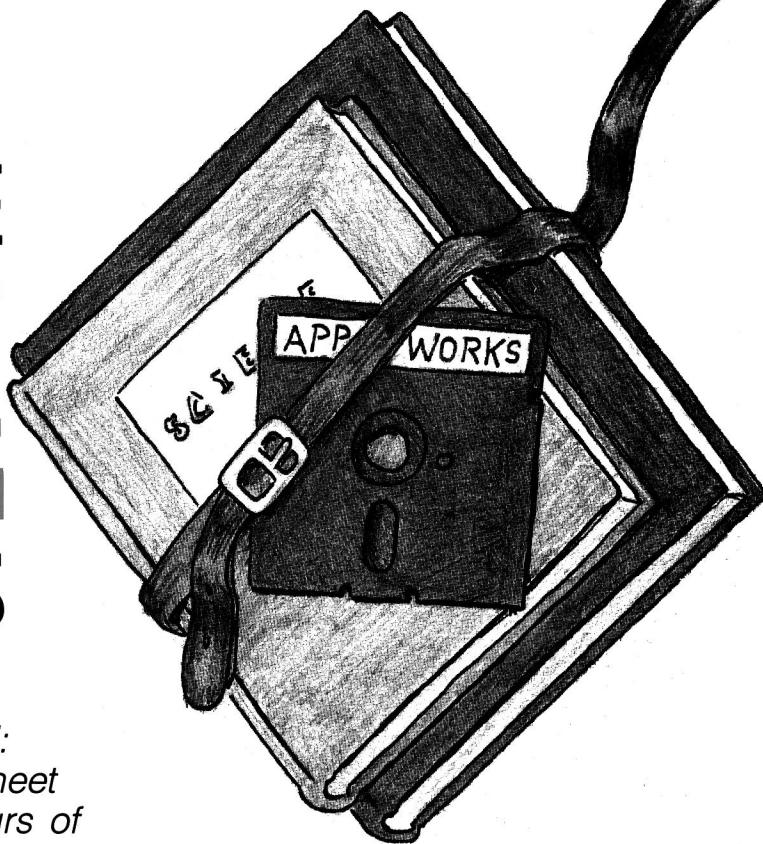
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MAKING THE GRADE WITH APPLEWORKS

*AppleWorks goes to school:
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by James G. Troutman

Computing student grades by hand is a lesson in frustration for any teacher. Your Apple can help. Many gradebook programs on the market lack the features you need, though, or include so many options they're slow and difficult to use. The solution is simple: With your AppleWorks spreadsheet you can create a gradebook that's convenient, fast, and easy to operate.

Although preparing the initial format takes some time, you'll soon make it up when you begin using your new gradebook. The accompanying AppleWorks spreadsheet also meets one specific need: dropping the lowest score,

a feature not found in some gradebook programs. You can easily edit it to meet other requirements, too, such as weighting grades.

This article assumes readers have a basic knowledge of AppleWorks, but includes detailed directions for lookup tables and IF formulas. **Figure 1** shows the final gradebook report. It's limited to four test scores and a roster of ten students, but is easy to alter for other class sizes and different testing procedures.

When you see a key combination such as OA-V in the following instructions, hold down the open-apple key while typing V. For repeated combinations, such as OA-down arrow (6 times), hold down the open-apple key and press the down arrow six times.

Figure 1. Printed report for AppleWorks gradebook.

MATH 153.04	TEST 1	TEST 2	TEST 3	TEST 4	TOTAL	MIN SCORE	AVERAGE SCORE	FINAL AVERAGE	GRADE	MATH 153.04	NAME
NAME	100	100	100	100	400						
ABROMITIS R.	94	61	89	88	332	61	83.0%	90.3%	4	ABROMITIS R.	
BECKER T.	86	64	67	71	288	64	72.0%	74.7%	2	BECKER T.	
CAVANAUGH L.	64	74	89	76	303	64	75.7%	79.7%	2	CAVANAUGH L.	
DICKINSON A.	67	73		70	210	67	70.0%	70.0%	2	DICKINSON A.	
GLADFELTER J.	82	70	83	81	316	70	79.0%	82.0%	3	GLADFELTER J.	
KELLER C.	76	67	67	68	278	67	69.5%	70.3%	2	KELLER C.	
LUCKAS F.	90	91	100	95	376	90	94.0%	95.3%	4	LUCKAS F.	
PARR G.	75	77	72		224	72	74.7%	74.7%	2	PARR G.	
RUSSEL D.	79	64	59	53	255	53	63.7%	67.3%	1	RUSSEL D.	
SCOTT E.	78	71	68	73	290	68	72.5%	74.0%	2	SCOTT E.	
MAXIMUM	94	91	100	95	376		94.0%	95.3%	4	MAXIMUM	
MINIMUM	64	61	59	53	210		63.7%	67.3%	1	MINIMUM	
AVERAGE	79.1	71.2	77.1	75.0	287.2		75.4%	77.8%	2.40	AVERAGE	

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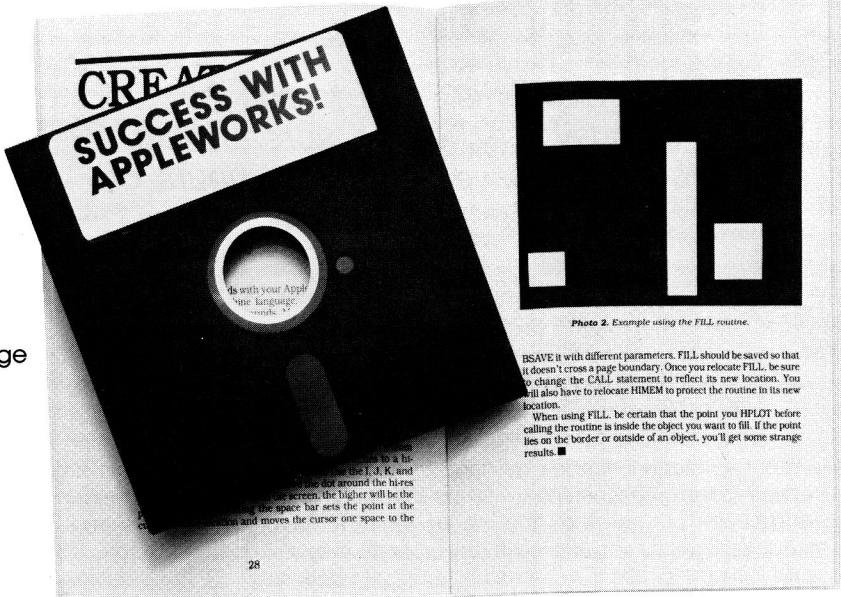


Photo 2. Example using the FILL routine.

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 HMOVE 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. ■

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Setting Column Widths

We'll start by constructing a general gradebook format you can use repeatedly to construct a grade sheet for each class you teach. Begin by using the AppleWorks Startup and Program disks to bring up a new spreadsheet screen. Choose *Add files to the Desktop* from the main menu, go to *Make a new file for the Spreadsheet, From scratch*, and type a name for this file: GRADE FORMAT.

At this point you should see the Review/Add/Change screen. Use the following description while you set up your spreadsheet so that it looks like the one in **Figure 2**.

Use the layout command, OA-L, to increase the width of column A by six characters. Select *Columns*, highlighting column A, then select *Column width*, press OA-right arrow (6 times), and hit the return key. This will allow you 15 character spaces for each student name.

Reduce columns B, C, D, E, and F by two characters each: Again use OA-L, select *Columns*, highlight columns

B, C, D, E, and F with the right arrow and return keys, select *Column width*, and press OA-left arrow (2 times). End by pressing the return key.

Column G should be reduced to a six-character width: Type OA-L, select column G and *Column width*, press OA-left arrow (3 times) and the return key. Columns H and I should remain at the standard nine-character width.

Reduce column J to six characters the same way you reduced column G. Increase column K by six characters to correspond to column A, since K will also contain student names. Columns L and M should remain at the standard nine-character width.

Labeling Your Spreadsheet

Type labels into rows 1, 2, 15, 16, and 17 as shown in **Figure 2**. Then type OA-L and select *Block* to change the items in B1 through J2 to *Label format, Right justified*. This will make the format labels look like those in **Figure 2**.

Figure 2. Setting up the gradebook spreadsheet.

File: GRADE FORMAT	REVIEW/ADD/CHANGE						Escape: Main Menu			
	A	B	C	D	E	F	G	H	I	J
1 COURSE		TEST 1	TEST 2	TEST 3	TEST 4	TOTAL	MIN	AVERAGE	FINAL	
2 NAME						SCORE	SCORE	AVERAGE	GRADE	
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15 MAXIMUM										
16 MINIMUM										
17 AVERAGE										
18										

Figure 3. Locations of formulas for grade calculation.

File: GRADE FORMAT	REVIEW/ADD/CHANGE						Escape: Main Menu			
	A	B	C	D	E	F	G	H	I	J
1 COURSE		TEST 1	TEST 2	TEST 3	TEST 4	TOTAL	MIN	AVERAGE	FINAL	
2 NAME						[1]	SCORE	SCORE	AVERAGE	GRADE
3						[1]	[2]	[3]	[4]	[5]
4						[1]	[2]	[3]	[4]	[5]
5						[1]	[2]	[3]	[4]	[5]
6						[1]	[2]	[3]	[4]	[5]
7						[1]	[2]	[3]	[4]	[5]
8						[1]	[2]	[3]	[4]	[5]
9						[1]	[2]	[3]	[4]	[5]
10						[1]	[2]	[3]	[4]	[5]
11						[1]	[2]	[3]	[4]	[5]
12						[1]	[2]	[3]	[4]	[5]
13						[1]	[2]	[3]	[4]	[5]
14						[1]	[2]	[3]	[4]	[5]
15 MAXIMUM		[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]	[6]
16 MINIMUM		[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]
17 AVERAGE		[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]	[8]
18										

You may want to consider using OA-V to set the *Standards/Value* format to *Commas* with zero decimal places. The numbers you'll use in the table will never be large enough to need commas, but this method of formatting places the numbers one character shy of the right edge of the cell, to produce columns better aligned with the headings.

Figure 3 shows the locations of the formulas that perform the calculations. Formulas will be placed in columns F, G, H, I, and J and in rows 15, 16, and 17.

Formula 1: Total

Using the arithmetic function $@SUM(B2...E2)$, place formula 1 in cell F2. Since you'll need the same relative formula in cells F4 through F13, call up AppleWorks' copy function: Place the cursor on cell F2 and type OA-C, choose *Within worksheet*, and hit the return key to indicate that you want to copy cell F2. Move to cell F4 and touch the return key. Use *Relative* for all reference cells. You'll copy this formula into the remainder of column F later.

Formula 2: Minimum Test Score

Column G will contain the minimum score for each student. In cell G4 type the minimum arithmetic function, formula 2, as $@MIN(B4...E4)$.

Formula 3: Average Score

In the H column you'll need to place the average of all test scores. Move to cell H4 and type in formula 3, $+F4/(@COUNT(B4...E4)*100)$. This formula makes use of the arithmetic function COUNT and lets you enter a blank for a missing grade without affecting the average of the scores. ERROR will appear in cell H4, because you haven't yet included any test grades. Ignore the ERROR message for the moment.

Formula 4: Final Average

We'll place the formula for the final average in column I. As mentioned above, this spreadsheet will use a formula that drops the lowest grade. The formula for this situation is an IF statement that determines whether the student is missing any grades (one of them would be dropped from the calculations).

Indicate a missing grade by leaving a blank space when you type in scores. If you use a zero to represent a missing grade, AppleWorks will still calculate the final average by dropping the lowest grade (now a zero), but the zero will adversely affect the calculations for minimum and average test score.

Move to cell I4 and enter formula 4, $@IF(@COUNT(B4...E4)*100 = F2, +(F4 - G4)/(F2 - 100), +F4/(F2 - 100))$. If there are no blank test scores, the final average is computed as the total of the scores minus the lowest score (G4), divided by the sum of the total possible scores minus 100. If any test is blank, the final average is computed as the total of the scores, divided by the sum of the total possible scores minus 100.

Formula 5: Numeric Grade

If you're using a numeric grading scale of zero = F, 1 = D, 2 = C, 3 = B, and 4 = A, use columns J, L, and M. Column J contains the formula that calculates the numeric grade through a lookup table located in columns L and M. Go to cell J4 and enter formula 5, $@LOOKUP(I4*100, L1...L5)$. Again ignore the ERROR message.

In columns F, G, H, I, and J of row 4, you have now entered all the necessary formulas for calculating individual grades. Now you need to copy them into rows 5 through 13. Place the cursor in cell F4 and type OA-C for copy, select *Within worksheet*, and press right arrow (4 times) to cell J4 to indicate that you want to copy all formulas in this row.

Hit the return key, down arrow to F5, type a period, down arrow through the spreadsheet to cell F13, and press the return key. Use the *Relative* option for all cells in columns F, G, and H. In column I use *Relative* for all cells except the three F2's, which you should enter with *No change*. In column J use the *Relative* option only for the I4; with all other cells use *No change*.

Formulas 6, 7, and 8: Maximum, Minimum, and Average Test Scores

You may find it helpful to tabulate maximum, minimum, and average test scores. To add this function to your spreadsheet, place the appropriate formulas into rows 15, 16, and 17. In cell B15 enter the arithmetic function $@MAX(B4...B13)$. In cell B16 type in $@MIN(B4...B13)$, and in cell B17 enter $@AVG(B4...B13)$. Ignore the ERROR message.

Now copy these formulas into the cells to the right: Place the cursor in cell B15 and type OA-C, *Within worksheet*, highlight B15, B16, and B17, press Return, move to cell C15, and type a period. Use the right arrow to move through the spreadsheet to cell J15. Use the *Relative* option for all cells.

Cell Values and Printer Options

Now it's time to change some of your standard layout values. Begin in B17. Type OA-L, select *Block*, choose through F17, select *Value format*, *Fixed*, and one decimal place. In the H column, type OA-L, selecting *Columns*, choose through column I, select *Value format*, *Percent*, and one decimal place.

Move to column L. Type OA-L, select *Column highlighting*, *Column L*, *Value format*, *Fixed*, and two decimal places. Blank cells G15, G16, and G17 by moving to G15; type OA-B, select *Block*, select through G17, and press Return. Finally, in cell J17 type OA-L, select *Entry*, *Value format*, *Fixed*, and two decimal places.

You need to insert several set values into your spreadsheet. Place a zero in cells B2, C2, D2, and E2. Type a zero in cell L1, 59.99 in L2, 69.99 in L3, 79.99 in L4, 89.99 in L5, zero in M1, 1 in M2, 2 in M3, 3 in M4, and 4 in M5.

To access your printer options, type OA-O, set the characters per inch to 12, the top margin to 1, bottom margin to 1, and *Print Report Headers* to *No*.

Now save the final gradebook format with OA-S.

Initializing the Gradebook

At the beginning of a semester, construct a gradebook for each section you're going to teach. With the AppleWorks Startup and Program disks, choose *Add files to the Desktop*, the *current disk*, and your *Grade Format* file. Use OA-N to rename it; for purposes of illustration, call your class MATH 153.04.

Figure 4. AppleWorks gradebook with first test scores entered.

REVIEW/ADD/CHANGE										Escape: Main Menu		
A	B	C	D	E	F	G	H	I	J	K	L	M
11MATH 153.04	TEST 1	TEST 2	TEST 3	TEST 4	TOTAL	MIN	AVERAGE	FINAL	AVERAGE	GRADE	MATH 153.04	0.00
21NAME	100	0	0	0	100	SCORE	SCORE	SCORE	SCORE	GRADE	NAME	59.99
31												1
41ABROMITIS R.	94				94	94	94.0%	ERROR	ERROR	ABROMITIS R.	79.99	3
51BECKER T.	86				86	86	86.0%	ERROR	ERROR	BECKER T.	89.99	4
61CAVANAUGH L.	64				64	64	64.0%	ERROR	ERROR	CAVANAUGH L.		
71DICKINSON A.	67				67	67	67.0%	ERROR	ERROR	DICKINSON A.		
81GLADFELTER J.	82				82	82	82.0%	ERROR	ERROR	GLADFELTER J.		
91KELLER C.	76				76	76	76.0%	ERROR	ERROR	KELLER C.		
101LUCKAS F.	90				90	90	90.0%	ERROR	ERROR	LUCKAS F.		
111PARR G.	75				75	75	75.0%	ERROR	ERROR	PARR G.		
121RUSSEL D.	79				79	79	79.0%	ERROR	ERROR	RUSSEL D.		
131SCOTT E.	78				78	78	78.0%	ERROR	ERROR	SCOTT E.		
141												
151MAXIMUM	94	0	0	0	94		94.0%	ERROR	ERROR		MAXIMUM	
161MINIMUM	64	0	0	0	64		64.0%	ERROR	ERROR		MINIMUM	
171AVERAGE	79.1	ERROR	ERROR	ERROR	79.1		79.1%	ERROR	ERROR		AVERAGE	
181												

Figure 5. Gradebook spreadsheet after three tests.

REVIEW/ADD/CHANGE										Escape: Main Menu		
A	B	C	D	E	F	G	H	I	J	K	L	M
11MATH 153.04	TEST 1	TEST 2	TEST 3	TEST 4	TOTAL	MIN	AVERAGE	FINAL	AVERAGE	GRADE	MATH 153.04	0.00
21NAME	100	100	100	0	300	SCORE	SCORE	SCORE	SCORE	GRADE	NAME	59.99
31												1
41ABROMITIS R.	94	61	89		244	61	81.3%	91.5%	4	ABROMITIS R.	79.99	3
51BECKER T.	86	64	67		217	64	72.3%	76.5%	2	BECKER T.	89.99	4
61CAVANAUGH L.	64	74	89		227	64	75.7%	81.5%	3	CAVANAUGH L.		
71DICKINSON A.	67	73			140	67	70.0%	70.0%	2	DICKINSON A.		
81GLADFELTER J.	82	70	83		235	70	78.3%	82.5%	3	GLADFELTER J.		
91KELLER C.	76	67	67		210	67	70.0%	71.5%	2	KELLER C.		
101LUCKAS F.	90	91	100		281	90	93.7%	95.5%	4	LUCKAS F.		
111PARR G.	75	77	72		224	72	74.7%	76.0%	2	PARR G.		
121RUSSEL D.	79	64	59		202	59	67.3%	71.5%	2	RUSSEL D.		
131SCOTT E.	78	71	68		217	68	72.3%	74.5%	2	SCOTT E.		
141												
151MAXIMUM	94	91	100	0	281		93.7%	95.5%	4		MAXIMUM	
161MINIMUM	64	61	59	0	140		67.3%	70.0%	2		MINIMUM	
171AVERAGE	79.1	71.2	77.1	ERROR	219.7		75.6%	79.1%	2.60		AVERAGE	
181												

In cell A1 replace the label COURSE with MATH 153.04. Beginning in A4 and continuing through A13, enter the names of the ten students in the class. If you place their last names first you can later use OA-A to arrange your gradebook in alphabetical order.

Copy all of column A into column K to allow for easier reading: Type OA-C with the cursor in A1, and select *Within worksheet*, down arrow to A17, and Return. Move to cell K1 and copy column A by pressing the return key. It's easier to read column K when it's right-justified, so type OA-L, *Column*, Return, *Label format*, and *Right justified*. You've already entered your students' names and are ready to begin the marking period.

Entering Test Scores

To see your AppleWorks gradebook in action, enter the student scores for test 1. Begin in cell B2. Replace the zero with the highest possible test score—use 100 as an example. List each student's test score in the appropriate cell, B4 through B13.

If you find the time between individual scores too long, change to manual recalculation: Type OA-V, *Recalculation*, *Frequency*, and *Manual*. (Be sure to type OA-K after entering the test scores.) **Figure 4** shows your gradebook after you've typed in the first test scores. Note that the Final Average and Grade show ERROR, since you need at least two test results to drop the minimum score.

inCider

As further illustration, type in student scores for tests 2 and 3. **Figure 5** shows your gradebook after you've entered three tests. Column F totals all test scores, G contains the minimum score, H calculates the average score, I drops the minimum score and recalculates the average, and J gives a numeric letter grade.

You can complete your AppleWorks spreadsheet by entering the last test score in column E. Your gradebook should now look like **Figure 1**. Note that **Figure 1** isn't a screen display, but a copy of the gradebook printout. If you want to list the grades in increasing or decreasing order, use OA-A to rearrange column H.

Your spreadsheet gradebook will save you hours of tedious arithmetic—and you can tailor it to fit individual needs. Spend your time and energy pursuing more creative areas of education, and let AppleWorks compute your classes' grades. ■

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SPELL IT OUT

Your Apple II is a tireless tutor that can help students master spelling and memorization.

by Tom Addicks

Every school-aged child faces the task of learning to spell and memorizing lists of words—and parents are often called upon to help.

Spelling Program, which is actually a series of six short programs, is designed to make this learning process more enjoyable for both child and parent. Possible subjects include states and capitals, science vocabulary, and foreign languages. This program can also help younger children learn to alphabetize.

How It Works

The program is broken down into six parts. First-time users must add their words by choosing 1 from the menu (see **Listing 1**). This creates a text file containing the words, and keeps count of the number of words in the file. After creating a lesson, you can either enter another lesson or proceed to the program itself.

Choosing 3 from the menu loads the HELLO program you've just created, and randomly chooses a word from the list. The program then presents you with the words *aardvark* and *zymurgy* (from **Listing 2**). The cursor waits until you type in a word that falls alphabetically between these two extremes (see the **Figure**).

Listing 1. Creating the opening menu.

```
5 VTAB 10
7 HOME
10 PRINT "SPELLING PROGRAM DEVELOPED BY:
15 PRINT "TOM ADDICKS"
20 PRINT "688 SOUTH MAIN STREET"
25 PRINT "GT. BARRINGTON, MASS."
30 PRINT "01230"
40 FOR I = 1 TO 3000: NEXT I
45 HOME
50 PRINT "CHOOSE ONE OF THE FOLLOWING."
55 PRINT : PRINT
60 PRINT "1 = ADD WORDS"
70 PRINT "2 = COMBINE LESSONS"
80 PRINT "3 = RUN THE SPELLING PROGRAM"
85 PRINT "4 = DELETE LESSONS"
86 PRINT "5 = PEEK AT THE WORDS"
87 PRINT
90 INPUT "YOUR CHOICE? ",N$
```

```
100 IF N$ = "1" THEN PRINT CHR$(4); "RUN LESSON.FILE"
110 IF N$ = "2" THEN PRINT CHR$(4); "RUN COMBINE"
120 IF N$ = "3" THEN PRINT CHR$(4); "RUN SPELLING"
125 IF N$ = "4" THEN PRINT CHR$(4); "RUN ERASE"
127 IF N$ = "5" THEN PRINT CHR$(4); "RUN INSPECT"
130 GOTO 90
```

Entering a list word replaces one of the extremes, so the child must now choose repeatedly until he or she "finds" the word the computer chose randomly. If the child types a misspelled word, the program responds that the word isn't in the list. A counter at the top right of the screen keeps track of the number of guesses.

Children and adults can use Spelling Program in any number of ways:

- Students can work together. As one child recites suit-

Listing 2. The main Spelling Program.

```
5 HOME : REM SPELLING PROGRAM DEVELOPED BY T. ADDICKS 11/85
20 HOME
40 PRINT CHR$(4); "CATALOG"
45 D$ = CHR$(4): DIM W$(200)
46 PRINT
50 INPUT "WHICH LESSON? ",L1$
70 PRINT D$; "OPEN LESSON ",L1$
80 PRINT D$; "READ LESSON ",L1$
90 INPUT N
100 FOR X = 1 TO N
110 INPUT W$(X)
130 NEXT X
140 PRINT D$; "CLOSE LESSON ",L1$
150 XX = INT((N * RND(1)) + 1
160 TA$ = W$(XX)
180 A$ = "AARDVARK": Z$ = "ZYMURGY"
190 HOME
200 HTAB 30; VTAB 1: PRINT C" GUESSES"
210 GOSUB 370
220 VTAB 6: HTAB 17: INPUT "",WWS
230 C = C + 1
240 GOSUB 500
250 IF WWS = TA$ THEN GOSUB 410
260 IF WWS > TA$ THEN GOTO 150
270 FOR I = 1 TO N
280 IF WWS = W$(I) THEN GOTO 340
290 NEXT I
300 HOME : VTAB 18
310 PRINT "NOT ONE OF YOUR WORDS"
320 FOR V = 1 TO 2000: NEXT V
330 GOTO 190
340 IF WWS < TA$ THEN A$ = WWS
350 IF WWS > TA$ THEN Z$ = WWS
360 GOTO 190
370 REM GRAPHICS
380 VTAB 6: PRINT "": VTAB 6:
PRINT A$: VTAB 6: HTAB (41 - LEN(Z$)): PRINT Z$
```

```
390 VTAB 2: PRINT "CHOOSE A WORD BETWEEN: "
400 RETURN
```

```
410 REM YOU GOT IT
```

```
420 HOME : PRINT "YOU FOUND IT!": FOR I = 1 TO 3000: NEXT I
```

```
430 INPUT "WOULD YOU LIKE TO PLAY AGAIN (Y/N)? ",Y$
```

```
440 IF Y$ = "Y" THEN 460
```

```
450 HOME : PRINT "BYE": END
```

```
460 INPUT "SAME LESSON? (Y/N) ",Y$
```

```
470 C = 0
```

```
480 IF Y$ = "N" THEN 50
```

```
490 RETURN
```

```
500 REM TRAILING SPACE ELIMINATOR
```

```
510 Q1$ = WWS
```

```
520 IF RIGHTS(Q1$,1) < > " " THEN WWS = Q1$: GOTO 540
```

```
530 Q1$ = LEFT$(Q1$, LEN(Q1$) - 1): GOTO 520
```

```
540 RETURN
```

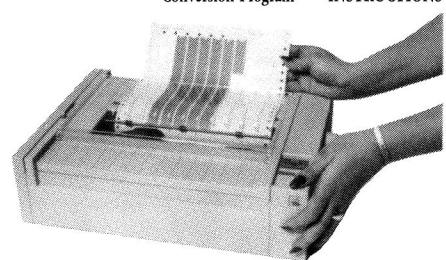
COMMUNICATE BETWEEN COMPUTERS...



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Conversion Program

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INSTRUCTIONS

ON PAPER



Use Mac or Apple files on a PC? Difficult? Not with the revolutionary Cauzin Softstrip™ System. With it you can easily move data between incompatible computers. Transfer ASCII or binary, word processing, data base or spreadsheet files. Mac to PC. PC to Mac. Apple to PC. And back again.

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- Print your file as strips using Apple STRIPPER™.
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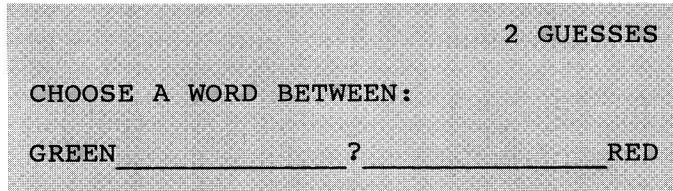
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able choices, the other must type each into the computer with correct spelling to progress.

Figure. In this sample screen, the child must choose and correctly spell a word between GREEN and RED.



- A child can work alone without a list. The program challenges the student to remember list words from categories such as the 50 states or presidents of the United States.
- You can create a file containing single letters to help the child learn alphabetic sequence. You can make alphabetizing more difficult by adding words that begin with the same few initial letters.
- Children can study foreign-language vocabulary. French, Spanish, or Latin words appear on screen as the student reviews their English equivalents, which he or she keeps next to the computer.

Teachers, students, and parents can find other creative uses for Spelling Program. Other choices on the menu let you combine lists or lessons—a cumulative review of spelling words, for example. In addition, you can delete lessons, or inspect the words included in each.

Analyzing the Program

Lines 40–140 in Spelling Program (**Listing 2**) catalog the disk and load the words into an array. Line 150 randomly chooses a word, and the TA\$ (TArget) becomes the term sought. The subroutine between lines 370 and 400 provides screen output.

Lines 220 and 230 wait for and count your guesses (WW\$ and C, respectively), while the subroutine beginning at line 500 eliminates trailing spaces you may have accidentally entered when you made a guess. Line 250 sends the program to YOU FOUND IT and lets you exit the program.

Listing 3. Combining several lessons into one.

```

5 HOME
10 DIM WS(100)
20 C = 0:S = 0
30 REM LESSONS TOGETHER
40 INPUT "COMBINE HOW MANY LESSONS? ",LS
50 FOR X = 1 TO LS
60 INPUT "LESSON # ",LT$(X)
70 NEXT X
75 PRINT
80 DS = CHR$(4)
90 FOR X = 1 TO LS
100 PRINT DS;"OPEN LESSON ",LT$(X)
110 PRINT DS;"READ LESSON ",LT$(X)
120 INPUT NN
130 E = Y + NN
140 FOR Y = S TO (E - 1)
150 INPUT WS(Y)
160 PRINT WS(Y)
170 FOR I = 1 TO 300: NEXT I
180 NEXT Y
220 PRINT DS;"CLOSE LESSON ",LT$(X)
230 S = E
235 PRINT
240 NEXT X
250 REM CREATES A MANY LESSON FILE
260 INPUT "LESSON NAME ",L1$ 
270 PRINT DS;"OPEN LESSON ",L1$ 
280 PRINT DS;"WRITE LESSON ",L1$ 
290 PRINT E
300 FOR J = 0 TO E
310 PRINT WS(J)
320 NEXT J
330 PRINT DS;"CLOSE LESSON "L1$ 
335 INPUT "WANT TO COMBINE MORE LESSONS (Y/N)? ",Y$ 
336 IF Y$ = "Y" THEN PRINT CHR$(4); "RUN COMBINE"
337 HOME
340 PRINT "TYPE 'PR#6' TO REBOOT."
350 END

```

gram, enter a new lesson, or continue the same one. If there's no match, lines 340 and 350 swap positions and return you to line 190 to make another guess.

The Combine program (**Listing 3**) merges lessons by opening each text file and loading the contents into an array (W\$) while keeping track of the number of items in each. Beginning at line 250, which combines chosen lessons, the program creates a new lesson.

Listing 4. Erase, simply deletes the text file from your disk, while Inspect (**Listing 5**) opens the file and prints each item on screen, so that you can determine the contents of the file.

Listing 4. Deleting text files from your disk.

```

10 REM ERASE
20 HOME
30 PRINT CHR$(4); "CATALOG"
40 PRINT
50 INPUT "ERASE WHICH ONE? ";ES
60 PRINT CHR$(4); "DELETE LESSON ";ES
70 INPUT "ERASE ANOTHER (Y/N)? ";YS
80 IF Y$ = "Y" THEN GOTO 20
90 HOME : PRINT "TO RUN SPELLING, TURN OFF THE COMPUTER": PRINT "AND REBOOT."

```

Listing 5. Inspecting the contents of a file.

```

10 REM PEEK AT WORDS
20 HOME
30 INPUT "LOOK AT WHICH LESSON? ",LA$
35 PRINT
40 DS = CHR$(4)
45 DIM LS(200)
50 PRINT DS;"OPEN LESSON ",LA$
60 PRINT DS;"READ LESSON ",LA$
70 INPUT N
80 FOR C = 1 TO N
90 INPUT LS(C)
95 PRINT LS(C)
100 FOR I = 1 TO 500: NEXT I
110 NEXT C
120 PRINT DS;"CLOSE LESSON ",LA$
125 PRINT
130 PRINT "TYPE 'PR#6' TO REBOOT."

```

Listing 6. Creating a lesson file.

```

5 HOME
10 DIM WS(50)
20 REM LESSON FILE
30 DS = CHR$(4)
35 PRINT "ADD WORDS"
40 INPUT "LESSON #: ",L1$
50 INPUT "HOW MANY WORDS ARE YOU ENTERING? ";N
60 PRINT "TYPE EACH WORD AFTER THE PROMPT."
65 PRINT
70 FOR X = 1 TO N
80 INPUT "WORD-----";WS(X)
90 IF X = N THEN PRINT "THAT WAS YOUR LAST WORD."
100 NEXT X
105 PRINT
110 INPUT "ARE ALL YOUR WORDS CORRECT? (Y/N) ";NS
120 IF NS = "N" THEN GOTO 30
130 PRINT DS;"OPEN LESSON ",L1$ 
140 PRINT DS;"WRITE LESSON ",L1$ 
150 PRINT N
160 FOR J = 1 TO N
170 PRINT WS(J)
180 NEXT J
190 PRINT DS;"CLOSE LESSON ",L1$ 
200 REM FILE IS WRITTEN
210 INPUT "DO YOU WISH TO ADD MORE WORDS (Y/N)? ";Y$ 
220 IF Y$ = "Y" THEN PRINT CHR$(4); "RUN LESSON.FILE"
230 PRINT
240 HOME
250 PRINT "TYPE 'PR#6' TO REBOOT."

```

Lesson.File (**Listing 6**) creates a file by generating an array with W\$ and writing the words stored in W\$ to a text file. Programmers can enlarge arrays by changing the appropriate DIM statements. Lessons that are too large make finding target words too difficult, though: No one ever memorized a spelling list by learning 100 words at a time. Appropriately sized files will give younger children the boost they need in spelling and memorization. ■

APPLEWORKS IN ACTION

Working with a Customer Data Base—Part 1

"Each customer is vitally important. This data base helps you stay in touch."



by Ruth K. Witkin

Murphy Vending installs small vending machines (the ones that dispense gumballs, candy, toys, and trinkets) in high-traffic locations, mainly supermarket, discount, and variety chain stores. The arrangement works well on both sides—Murphy gets the floor space, the store gets a share of the profits. Each customer is vitally important. A loss of even one chain store can mean the loss of many outlets.

Let's pretend you're Larry Murphy. In this session, the first of three parts, you enter categories and records into a customer data base, change the layout of the multiple-record screen, create a report format for the master account list shown in **Figure 1**, view the list on screen, select records from the list, and print the list. This data base helps you stay in touch with your customers, analyze sales, and generate mailing labels for marketing material.

Next month I'll explain how to use the customer data base to print reports containing calculations, and in October I'll show you how to convert one of these reports into a spreadsheet to do spreadsheet-style calculations.

Keystrokes and Other Matters

When you see such key combinations as OA-Y, hold down the open apple key and type Y. With repeated combinations, such as OA-left arrow (11 times), hold down the open apple key, and press the left arrow key 11 times.

You'll be working with the insert cursor—the blinking underline—until the instructions say otherwise. If you make a typo, press Delete to back up the cursor and erase the character.

Several times during the creation process, I'll ask you to save the data base. If you have a one-drive system, watch the screen for prompts that tell you when to swap the Program disk for the data disk.

Creating the Data Base from Scratch

Use the AppleWorks Startup and Program disks to bring up a new data-base screen. Name this file **CUSTOMERS**. You should now see the Change Name/Category screen.

This data base contains 15 cate-

gories, two of which are spares—dubbed, aptly enough, SPARE. It's a good idea to have at least one in every data base. If you later want to enter another category (as you'll see in next month's column), you can just type over SPARE with a different name and make your entries. Without a spare, you'll have to insert a category, which will wipe out any custom screen layouts and report formats.

Here's what the category abbreviations stand for: ACC# is account number, B# is the code number for the company's type of business, LYTD\$ is last year-to-date sales, and YTD\$ is current year-to-date sales.

First enter the category names. The cursor is on the C in *Category 1*. Press OA-Y to erase these words. Now type in the following category names (be sure to press the return key after each one): **ACC#, COMPANY, STREET, CITY, STATE, ZIP, CONTACT, TITLE, BUSINESS, B#, LYTD\$, YTD\$, SPARE**, and **SPARE**.

Check to make sure that every category is entered and spelled correctly. If one's missing, place the cursor on the category name immediately below the spot where the missing one belongs, press OA-I to insert a blank line, type the category name, press OA-Y to delete the dash at the end, and press Return.

Press OA-S to store the data base on disk. AppleWorks now automatically goes into the Insert New Records mode. Press the space bar or the return key, and Record 1 appears with all the categories awaiting your entries.

Inserting New Records

Figure 2 shows the entries in Records 1 to 9. The B# category identifies the customer's type of business: 1 is a food chain, 2 is a variety chain, and 3 is a discount chain. These numbers serve the same purpose as the description in the BUSINESS category, but take up less room on a report.

Setting a Standard Value

A standard value is an entry that's common to most or all of the records. The contact person in six of the nine records is president of the company,

APPLEWORKS IN ACTION

which qualifies **President** as a standard value. Press the down arrow key (8 times) to move the cursor to the **TITLE** category. To set the standard, press OA-V, type **President**, and press Return. Press the escape key to return to Record 1, which now shows President in the **TITLE** category.

Making Entries in the Records

Press the up arrow key (9 times) to return to the **ACC#** category. Now enter the rest of the information in

Record 1: Type **87** and press Return. Type **Family Centers** and press Return. Type **123 Apple Square** and press Return. Refer to **Figure 2**, and continue typing the entries in Record 1, pressing the return key after each one. After the contact name, press Return twice to skip past the **President** entry. After you type **11070** in the **YTD\$** category, press Return, then OA-down arrow to bring up Record 2.

Now fill Records 2 to 9. Before you start, however, take a few moments to read the following instructions:

Record 3: The contact's title in Record 3 is **VP, Operations**, not **President**. When you get to this entry, press OA-E to switch to the overstrike cursor (a blinking rectangle) and type **VP, Operations** over **President**. Leave the overstrike cursor activated.

Record 4: American Stores is a new customer, so there's no sales figure for last year. To skip past the **LYTD\$** category, press Return twice after you type the business code.

Records 5 and 6: Type over the standard **President** with the title shown in **Figure 2**.

Now enter the information in Records 2 to 9 as you did in Record 1. When you're finished, the cursor should be in the first **SPARE** category in Record 9. Press OA-S to store the data base on disk.

Changing the Screen Layout

The first five categories in all the records should now be on screen. If they're not, press OA-1. Some entries (company and street) are truncated, while others (account number, state, and zip) have more room than they need. AppleWorks makes it easy to change the column widths so that you can see the complete entry and fit more categories on the screen.

Press OA-L to bring up the Change Record Layout screen. Let's start by reducing the width of the **ACC#** category: Press OA-left arrow (11 times). Now press the right arrow key to move the cursor to each of the following categories and adjust the column width in the same way:

COMPANY: press OA-right arrow (5 times)

STREET: press OA-right arrow (2 times)

CITY: press OA-left arrow (5 times)

STATE: press OA-left arrow (12 times)

ZIP: press OA-left arrow (8 times)

Now press the escape key. AppleWorks asks which way the cursor should travel when you press Return. The standard *Down* is fine, so press the return key. The Review/Add/Change screen returns with seven categories nicely spaced.

It makes more sense to arrange your records alphabetically by company name instead of randomly as you entered them. Press the tab key to move the cursor to the **COMPANY** category. Now press OA-A. AppleWorks proposes *From A to Z*, which is what you want, so press Return.

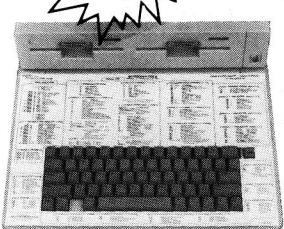
Creating a Report Format

Next, create a report format for the master account list. Press OA-P to

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Figure 1. Master Account List created with the customer data base.

File: CUSTOMERS	Report: MASTER ACCOUNT LIST	Page 1					
ACCM COMPANY	STREET	CITY	STA ZIP	PHONE	CONTACT	B#	8-23-86
179 Ace Supermarkets	72 Harrison	Concord	CT 06623	203-555-4560	Gil Freeman	1	
85 Allied Grocers	52-A William St.	Hillsburg	NY 14107	518-555-0787	Evelyn Aven	1	
153 American Stores	333 Sheffield St.	Stoville	NY 11456	516-555-8765	Ollie O'Day	2	
142 Arbor Sales Co.	567 12th St.	Lincoln	NJ 08904	201-555-2300	Ben W. Smith	3	
43 Crown Supermarts	105 Columbus Ave.	Boston	MA 02110	617-555-0220	Homer Capella	1	
56 Dollar Shops Inc.	12 Elman St.	Miami	FL 33110	305-555-0600	Don Johnson	3	
87 Family Centers	123 Apple Square	Ellsworth	NJ 07215	609-555-9874	Fay L. Byrd	2	
22 Key Markets	5 Grand Ave.	Tandy	MD 20643	301-555-2621	Ken Wolin	1	
63 Off The Shelf, Inc.	90 Adams St.	Addison	CT 06520	203-555-9008	Connie Dowd	3	

Figure 2. Records 1 to 9 in an AppleWorks customer data base.

CATEGORY	RECORD 1	RECORD 2	RECORD 3
ACC#:	87	43	179
COMPANY:	Family Centers	Crown Supermarts	Ace Supermarkets
STREET:	123 Apple Square	105 Columbus Ave.	72 Harrison
CITY:	Ellsworth	Boston	Concord
STATE:	NJ	MA	CT
ZIP:	07215	02110	06623
PHONE:	609-555-9876	617-555-0220	203-555-4560
CONTACT:	Fay L. Byrd	Homer Capella	Gil Freeman
TITLE:	President	President	VP, Operations
BUSINESS:	Variety	Food	Food
B#:	2	1	1
LYTD\$:	12564	19517	33722
YTD\$:	11070	18203	35999
SPARE:			
SPARE:			
CATEGORY	RECORD 4	RECORD 5	RECORD 6
ACC#:	153	142	85
COMPANY:	American Stores	Arbor Sales Co.	Allied Grocers
STREET:	333 Sheffield St.	567 12th St.	52-A William St.
CITY:	Stoville	Lincoln	Hillsburg
STATE:	NY	NJ	NY
ZIP:	11456	08904	14107
PHONE:	516-555-8765	201-555-2300	518-555-0787
CONTACT:	Ollie O'Day	Ben W. Smith	Evelyn Aven
TITLE:	President	Purchasing Agent	VP, Purchasing
BUSINESS:	Variety	Discount	Food
B#:	2	3	1
LYTD\$:	28560	32100	32645
YTD\$:	9321	32742	32645
SPARE:			
SPARE:			
CATEGORY	RECORD 7	RECORD 8	RECORD 9
ACC#:	56	22	63
COMPANY:	Dollar Shops Inc.	Key Markets	Off The Shelf, Inc.
STREET:	12 Elman St.	5 Grand Ave.	90 Adams St.
CITY:	Miami	Tandy	Addison
STATE:	FL	MD	CT
ZIP:	33110	20643	06520
PHONE:	305-555-0600	301-555-2621	203-555-9008
CONTACT:	Don Johnson	Ken Wolin	Connie Dowd
TITLE:	President	President	President
BUSINESS:	Discount	Food	Discount
B#:	3	1	3
LYTD\$:	30450	10987	25000
YTD\$:	32345	13450	28567
SPARE:			
SPARE:			

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APPLEWORKS IN ACTION

start the Print command, and follow these steps to create a new tables format and give the report a name: Press Return, type **MASTER AC-COUNT LIST**, and press the return key again. The Report Format screen appears with commands, cursor movements, the first three entries in the first six categories, and part of a seventh category on the right.

It would be great to print every category, but there's a limit to the number that can fit across a page. This

report, therefore, contains only the account number, company name, street, city, state, zip, phone, contact, and business code. The other categories—title, business, last year-to-date, year-to-date, and both spares—are deleted. You can reinsert these deleted categories at any time.

So that you can see the categories you're deleting, press the right arrow key 14 times, then the left arrow key six times. Your cursor should be in the TITLE column. Now delete unnec-

essary categories: Press OA-D twice, press the right arrow key, and press OA-D (4 times). The cursor is now on *Len117*, the print width of the remaining categories.

The plan is to print this report at 12 characters per inch, which allows for an estimated 96 characters per line. To produce the proper spacing, you need to make some columns wider, others narrower. Hold down the left arrow key to move the cursor to column A (ACC#). To reduce the width, press OA-left arrow (8 times). Press the right arrow key to move to each column (except CONTACT, which remains as is for now) and adjust the width as follows:

COMPANY: press OA-right arrow (7 times)

STREET: press OA-right arrow (5 times)

CITY: press OA-left arrow (2 times)

STATE: press OA-left arrow (9 times)

ZIP: press OA-left arrow (5 times)

PHONE: press OA-right arrow (1 time)

B#: press OA-left arrow (10 times)

The print-width indicator should now read *Len96*.

Let's prepare for printing. Press OA-O to bring up the Printer Options screen. Set the character size and top margin, and tell AppleWorks you want the report double spaced: Type **CI** and press Return. Type **12** and press Return. Next, type **TM** and press Return. Type **.5** and press Return. And finally, type **DS** and press the return key again. Now press the escape key to return to the Report Format screen.

To get an idea of what this report will look like on paper, display it on screen first: Press OA-P, type **2**, and press the return key twice. Here are the first seven categories of the first seven records. Press the return key again, and the last two records appear. Press the return key again to return to the Report Format screen.

Printing the Report

It's printing time, so turn on your printer. Press OA-P to start the Print command, and follow these steps to print one copy of the report: Type a printer number and press Return, type today's date, and press the return key twice.

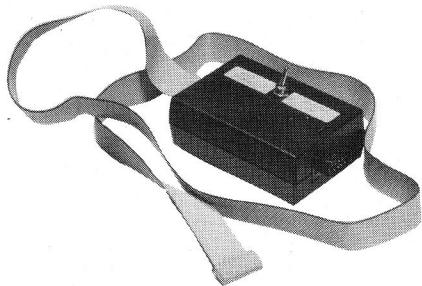
When the printer stops, take a close look at the contact name in the Crown Supermarts record. The last *a* in *Capella*, which you couldn't see on screen, is missing. Compare the right edge of the date in the header with the B# category—it's a clue. Although the Printer Options screen says you can print an estimated 96 characters

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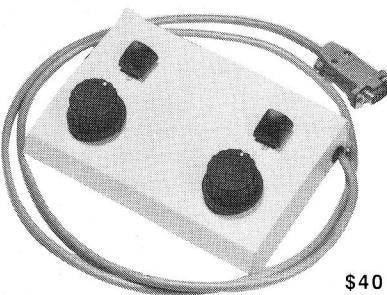


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Back Issues

at 12 characters per inch, it's clear that AppleWorks can print 97 characters—a good thing to know if you need a tad more room.

Move the cursor to the CONTACT column and increase its width by pressing the OA-right arrow key once. The indicator now shows *Len97*. Print the report again by pressing OA-P and the return key (3 times). Perfect. Press OA-S to store your work on disk. Saving the data base brings back the Review/Add/Change screen.

Selecting Records for Printing

Let's suppose you want to send a list of New Jersey customers to your local branch office. First, return to the Report Format screen: Press OA-P and press the return key twice. Leave the cursor in the ACC# column.

Next, tell AppleWorks you want to select the records by state: Press OA-R, type **5**, and press the return key. The screen now shows 12 selection criteria. The highlight is on *equals*, which is what you want, so press the return key again. You now need to specify the comparison information. Type **NJ** and press Return. The third line at the top left of the screen shows *STATE equals NJ*. AppleWorks now asks if you have any other comparison information. You don't, so press the escape key.

You're all set to print the selected records. Press OA-P and the return key (3 times). And here's the report on Arbor Sales and Family Centers. To return the selection to all records, press OA-R and type **Y**. That's all there is to it.

Though the temptation may be great, don't change anything in this data base. Next month, when you create reports that do calculations, you'll want everything exactly as is. (You can, of course, give the data base a different file name and play around with that one.) ■

Ruth K. Witkin is a consultant in computer applications for business. She is the author of Managing Your Business With Multiplan (Microsoft Press), Managing With AppleWorks (Howard W. Sams & Co.), Personal Money Management With Multiplan (Hayden Books), 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 want a personal reply, but please be patient.

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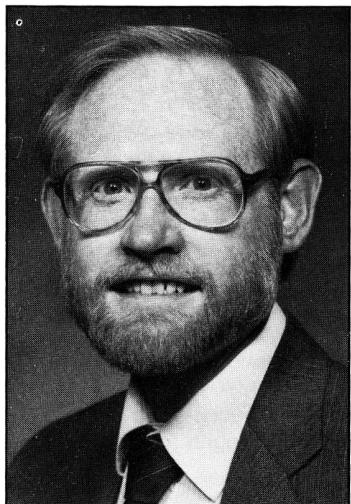
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APPLESOFT ADVISER

Scrambler

"Scrambler demonstrates some of the ways you can use BASIC to work with words and letters."



by Dan Bishop

Applesoft's ability to manipulate numbers was illustrated in the Compuapple program, presented last month (July 1986, p. 73). Using that program, you can turn your Apple into a five-function calculator—a rather expensive one at that.

But your Apple has many capabilities that go far beyond those of simple calculators. One such feature is its ability to handle alphabetic characters. Scrambler (see the **Program listing**) demonstrates some of the ways you can use BASIC to work with words and letters.

Literals and String Variables

BASIC provides two methods of handling alphabetic information in a program. One way is to enter the alphabetic text as part of the program itself. In this case, you must place the text within quotation marks. Because you can't change it during program execution, its value remains constant, and it's referred to as a *literal*, or *string constant*. In the BASIC command

PRINT "TODAY IS TUESDAY"

the computer "sees" a literal expression enclosed in quotation marks. The computer won't interpret the characters in the literal—the command is to PRINT, and the object to be printed is a string of alphabetic characters that means nothing to the computer.

The problem with literals is that you can't change them. If the above command appears in your program, the computer will display TODAY IS TUESDAY on screen every time you run the program, no matter what day of the week it is.

Another way to represent alphabetic information in BASIC is to use *string variables*. A variable is a one- or two-character name for a memory address that stores information in the computer. If the information you want to store is alphanumeric (rather than purely numeric), BASIC requires a dollar sign after the variable name. The dollar sign makes the variable a string variable. Examples of string-variable names Applesoft allows include A\$, F3\$, LK\$, ZZ\$, and N\$.

As with numeric variable names, the first character must be alphabetic (A through Z), while the second character

can be alphabetic or numeric. You can use longer names, but Applesoft will use only the first two characters. For example, Applesoft treats both CUSTOMERNAME\$ and CUSTOMERCITY\$ as CU\$, and the program will lose data if you use them simultaneously.

You assign actual values to string variables with a simple assignment statement. For example,

DY\$ = "TUESDAY"

stores the value TUESDAY in memory with the string variable DY\$ (read "D-Y-string") attached to it. Now, whenever you want to use the word TUESDAY within your program, you just use DY\$.

The INPUT command provides a more versatile way to assign values to variables. INPUT lets you enter your data from the keyboard and assign them to the variables attached to the INPUT statement. For example, the two following BASIC commands

200 PRINT "WHAT IS YOUR NAME?"
210 INPUT NM\$

display the prompting message, WHAT IS YOUR NAME? on screen. The computer then stops until you type something in and press the return key. Whatever you type in is then stored in memory with the variable name NM\$. The command PRINT NM\$ will now display that information.

You should be able to see how string variables can be more useful than literals. If Ann runs the program and types ANN in response to the prompt, the program from that point on substitutes the word ANN every time it encounters NM\$. Later, when Bob runs the program and enters BOB at the prompt, the program will use his name whenever NM\$ crops up. Note that lines 150 and 160 in the **Program listing** follow the same example.

Chopping and Dicing

BASIC has several functions you can use with text information; Scrambler includes three of them. The LEN function returns a value that corresponds to the number of characters (including blank spaces) the string contains. For example, if you enter the two commands

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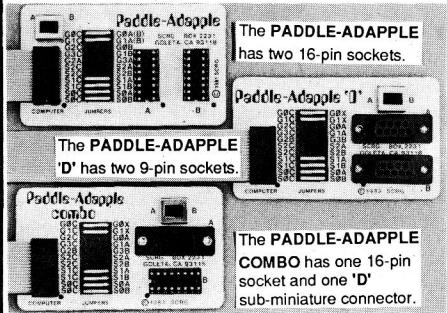
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Program listing. Scrambler.

```
5 REM SCRAMBLER - INCIDER (8/86)
6 REM LETTER SCRAMBLING PROGRAM
10 HOME
20 PRINT "PRESS ANY KEY TO START..."
30 R = RND (1)
40 X = PEEK (- 16384)
50 POKE - 16368, 0
60 IF X < = 127 THEN GOTO 30
100 DIM K(10)
110 FOR I = 1 TO 10
120 K(I) = 0
130 NEXT I
140 HOME
150 PRINT "ENTER THE WORD TO BE SCRAMBLED..."
160 INPUT Z$
170 A = LEN (Z$): Y$ = ""
180 IF A > 10 THEN PRINT "TOO MANY CHARACTERS.": PRINT : GOTO 300
190 FOR J = 1 TO A
200 R = INT (RND (1) * A + 1)
210 IF K(R) < = 0 THEN GOTO 200
220 Y$ = Y$ + MID$ (Z$, R, 1)
230 K(R) = 1
240 NEXT J
250 PRINT " SCRAMBLED: ";
260 PRINT Y$
270 PRINT
300 PRINT " AGAIN? (Y/N) "
310 INPUT RS
320 IF RS = "Y" THEN GOTO 110
330 IF RS < = "N" THEN GOTO 300
340 END
```

D\$ = "HAPPY NEW YEAR"
PRINT LEN(D\$)

the computer displays the number 14, since there are 14 characters in the text D\$ contains.

Scrambler also uses the MID\$ function, which lets you extract a specific portion of a string. You must name the string on which you want to operate, specify the point at which the operation should begin, and specify the number of characters you want MID\$ to extract. Enter the two commands in the previous paragraph, then these two additional commands:

X\$ = MID\$(D\$, 7, 5)
PRINT X\$

The computer displays NEW Y. The MID\$ command operated on the text stored in D\$ (HAPPY NEW YEAR). It began the operation at the seventh character, N, and took out five characters, counting the space: NEW Y. This new text was stored in memory as X\$.

As you can see, the MID\$ function is useful for chopping strings into little pieces. Scrambler uses this function in line 220:

220 Y\$ = Y\$ + MID\$(Z\$, R, 1)

Z\$ is the word to be scrambled; R

is a randomly generated number that selects the character in the word to be pulled out next; and the number 1 tells the computer to pull out only a single character.

Line 220 also uses BASIC's *string-concatenation operator*, the plus sign. When used with text information, the plus sign tells the computer to attach the text that appears on the right side of the sign to the end of the text that appears on the left side. So if A\$ = "HAPPY" and if B\$ = "BIRTHDAY", the command

PRINT A\$ + " " + B\$

will display HAPPY BIRTHDAY.

Similarly,

X\$ = A\$ + " " + B\$

will store the combined expression as X\$.

In Scrambler, line 220 appears inside a loop. The program initializes Y\$ to null (Y\$ = "") in line 170 before entering the loop. Inside the loop, the computer randomly selects one character from the original word and attaches it to the end of the current string Y\$ contains. Thus Y\$ grows one character at a time, from a string having no characters at all to

one that contains all the characters in the original string, but with the order totally scrambled.

The Randomizer

Scrambler uses Applesoft BASIC's random-number generating function, RND, to randomly select which character to extract next from the original word. RND(1) generates a random number between zero and one (not including zero or one). Since you're probably interested in using RND to generate a random integer (whole number) between one and some maximum value, you must use the form

R = INT(RND(1) * A + 1)

where A contains the maximum value you want your program to generate. The variable R stores the result. Note that this equation is exactly what you see in line 200 of Scrambler. Line 170 calculates the value of A as the length of the string to be scrambled.

The RND function has one disturbing characteristic, though. Each time you run the program, the RND function begins generating the same list of random numbers. This means that if you enter the word DICTIONARY as the first word to be scrambled each time you run the program, you'll always get the same scrambled form (INYDCITORA, for example). The first ten random numbers the computer generates will always be the same each time you run the program.

To avoid this problem, Scrambler uses a technique that works well on the Apple //e system. Lines 10-60 use the X = PEEK(-16384) command to set up a timing loop that looks for a keyboard entry and assigns a value between 128 and 255 to X, depending on which key has been pressed. If no key is pressed, X is given a value between zero and 127. Line 50 resets the keyboard scanner. Line 60 checks the value of X; if it's less than or equal to 127, no key has been pressed, and the computer cycles through the loop again.

The randomizing trick lies in line 30. Each time the computer cycles through the loop, it generates a new random number. So if you wait 4.55 seconds after starting the program before you press a key to end the cycle, the computer might generate, say, 107 random numbers. The first random number used during scrambling will be the 108th one in Applesoft's list.

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The next time you run the program, you might wait 5.7 seconds before pressing a key to continue the program. This time, the computer will generate perhaps 128 random numbers, so the 129th number in the list is used during the word scramble. Using this little routine before calling for a random number is about the best you can do toward truly randomizing your number sequences.

Not-So-Random Randomizing

If you've followed the program description to this point, you know that R is a randomly generated number between one and the number of characters in the string to be scrambled. But if R is truly random, what keeps a certain value from turning up more than once? For example, if the word to be scrambled, Z\$, is INCIDER, and R turns up as the number 3, then the letter C is pulled out for use in the scrambled word. What if R

comes up as 3 again? You can't have another C appear in the scrambled word.

A simple trick to keep track of the letters in the original word that have already been chosen is to define an array, K, as having ten elements:

100 DIM K(10)

This line gives the program ten separate variables for the program to use—K(1) through K(10). The computer gives each of these ten elements a value of zero in lines 110–130. Then, when a value for R is randomly generated during the scramble process (lines 190–240), the program checks the value for the corresponding array element, K(R) (line 210). If K(R) is still zero, the program then removes the R'th letter from the original string and adds it to the scrambled string (Y\$). It then gives K(R) a value of one (line 230), and loops back to generate another value for R to select another letter. If a value for R is generated for which K(R) = 1 already, the computer loops back to generate a new random value.

Conclusion

The rest of the program is fairly straightforward. If you want to scramble words that are longer than ten characters, change the value 10 that appears in lines 100, 110, and 180 to whatever new value you want to use.

When you see how simple this program is, you might ask if a simple "unscrambler" program could be written as well. Unfortunately, this is one case in which it's easy to work in one direction but not in the other. In the first place, the computer could never "know" when a given combination of letters might correspond to a valid word. The program would have to display all possible combinations and leave the decision up to you. But the number of permutations for a word with only six letters is 720 ($6 \times 5 \times 4 \times 3 \times 2 \times 1$); for a ten-letter word, the number of possibilities is 3,628,800!

To carry out this task efficiently, a program would need recursive subroutines—that is, subroutines that can call themselves—and BASIC handles recursion awkwardly, to say the least. Pascal would be a better choice for an unscrambler program, but for words of any length, the task still remains impractical. ■

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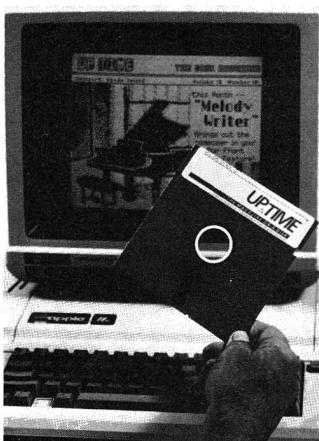
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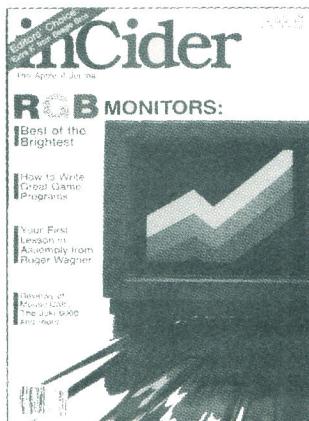
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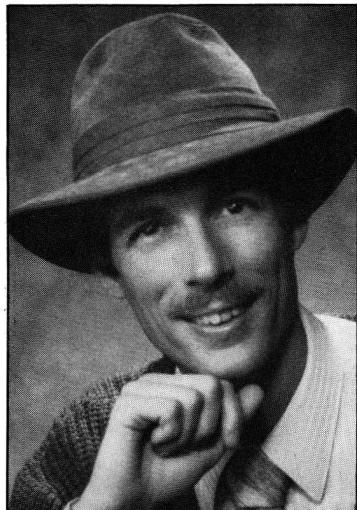
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RIGHT OF ASSEMBLY

Machine-Language Addressing Modes

**"We've worked
our magic
simply by
manipulating
the contents of
those 64,000
memory
locations."**



by Roger Wagner

Flexibility in addressing the Apple's individual memory locations is the key to greater power in your programs. The various addressing modes available on the Apple are fundamental to machine-language programming, and you might justifiably wonder why we haven't covered them sooner. Well, as it happens, we have—I just didn't call them by name at the time.

In the first installment of Right of Assembly (October 1985, p. 68), we laid out the basic structure of 64,000 individual memory locations. Over the last few months, we've worked our magic simply by manipulating the contents of those locations.

Addressing Modes

The **Table** lists each addressing mode with an example. All but the last three examples should be familiar to you—each of them appeared in programs previously presented in this column.

You use the *immediate* mode to load a specific value into a register, indicated in most assemblers by the pound sign (#) preceding the value you want to load. This contrasts with the *absolute* mode, in which you retrieve a value from a given memory location. In absolute mode, you specify the exact address in which you're interested.

Zero page is basically just a variation of absolute mode. The main difference is in the number of bytes in the coding: The general case takes 3, while zero-page addressing requires only 2.

The *Implicit* (or *implied*) instruction is the most compact, in that it uses only

1 byte. The TAY command (transfer accumulator to the Y register) needs no additional address bytes, because the source and destination of the data are implied in the instruction itself.

Relative addressing is done relative to the point at which you find the first byte of the instruction itself. Although the example in the **Table** interprets it as a branch to a specific address, the actual hex code is merely a plus or minus displacement from the branch point.

You can create quite a variety of programs with these five instructions, as I hope you've been doing on your own. But programs created with these modes are rather inflexible in dealing with data from the outside world (such as in input routines), or when you want to access tables or large blocks of data.

Indexed Addressing

For more flexibility you can use *indexed* addressing, in which you add the contents of the X or Y register to the address given in the instruction to determine the final address. In the example given in the **Table**, if the X register holds a zero, the contents of location \$200 are loaded into the accumulator. If the X register holds a \$04, then location \$204 is accessed. The usefulness in accessing tables is obvious.

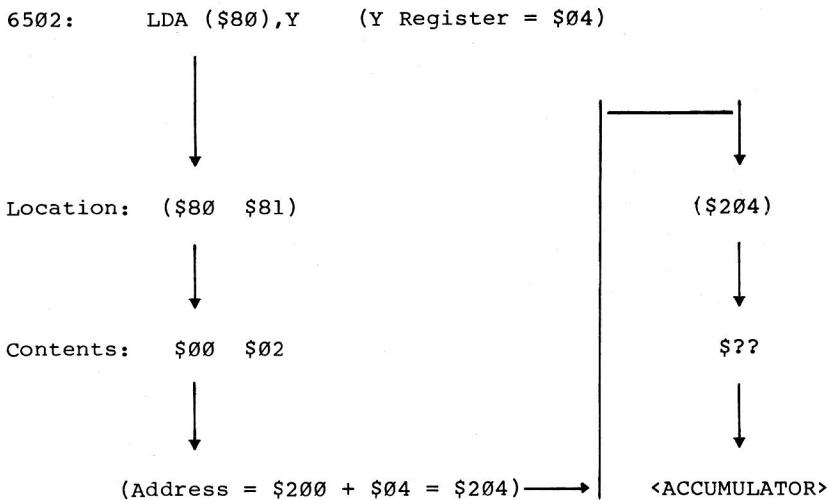
A problem arises, though, when you want to access a table that grows or shrinks dynamically as the data within it change. Another problem occurs when the table grows larger than 256 bytes, since the maximum offset possible using the X or Y register is 255.

Table. Machine-language addressing modes.

Addressing Mode	Example	Hex Bytes
Immediate	LDA #\$A0	A9 A0
Absolute	LDA \$7FA	AD FA 07
Zero Page	LDA \$80	A4 80
Implicit/Implied	TAY	A8
Relative	BCC \$3360	90 0F
Indexed	LDA \$200,X	BD 00 02
Indirect Indexed	LDA (\$80,X)	A1 80
Indexed Indirect	LDA (\$80),Y	B1 80

RIGHT OF ASSEMBLY

Figure 1. Indirect-indexed addressing.



The *indirect-indexed* mode provides a really elegant solution to these problems. First, the 6502 goes to the given zero-page location (the base

address must be on zero page). In the example shown in **Figure 1**, the computer goes to \$80 and \$81 to get the low- and high-order bytes of the

address stored there, then adds the value of the Y register to that address.

These 2-byte zero-page address pairs, often called *pointers*, are frequently used in Apple programming. In fact, Applesoft uses quite a number of these byte pairs. You can use them to keep track of all sorts of continually changing things, such as where the program is, the locations of strings and other variables, and many other nifty items.

To simulate the LDA \$200,X command with indirect mode, you first store a #\$00 in \$80 and a #\$02 in \$81 (00 and 02 are the low- and high-order bytes of the address \$200), then use the command LDA (\$80),Y. You've probably noticed that I used the X register in one case and the Y register in the other. It turns out that the X and Y registers can't always be used interchangeably. The difference lies in which command (LDA or STX, for instance) and addressing mode you use. As it happens, you can do indirect-indexed

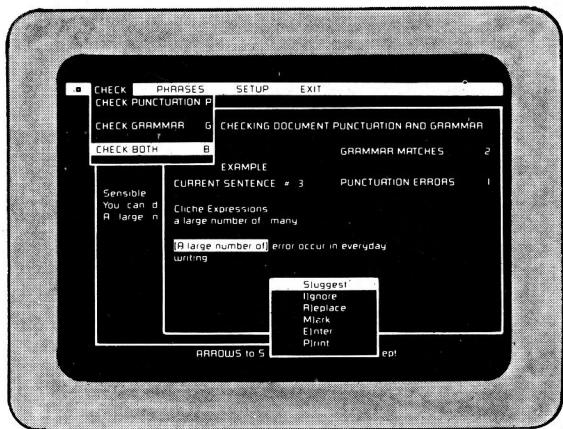
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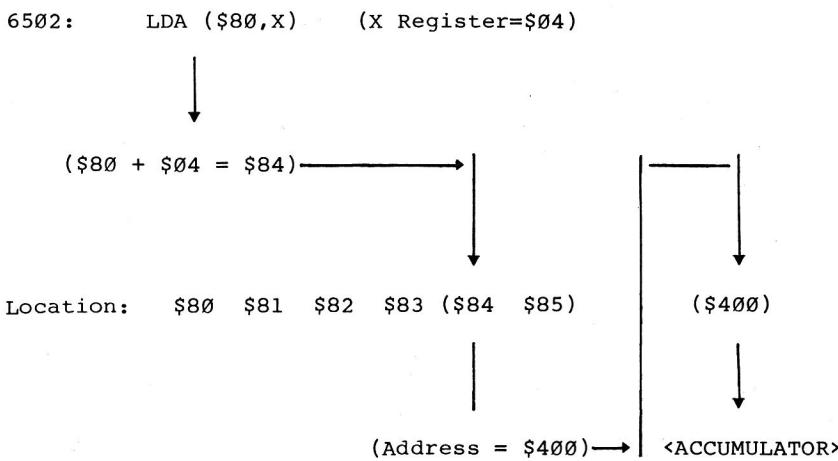
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Figure 2. Indexed-indirect addressing.



addressing only with the Y register. To find out what's legal, refer to one of the many books on machine-language programming, or look for a chart in your *Apple Reference Manual*.

The last addressing mode, *indexed indirect* (see **Figure 2**), is probably the most unusual. In this case, you add the contents of the X register (you can't use Y for this mode) to the

base address *before* getting the contents. If the X register held a zero, an LDA (\$80,X) would go to \$80 and \$81 for the 2-byte address, and then load the accumulator with the contents of the indicated location. If, instead, the X register held a 04, the memory address would be determined by the contents of **\$84 and \$85!**

Usually, you load the X register with multiples of two to access a series of continuous pointers in zero page.

Using Directives

Before you can put all this new information to work, you need to answer one more question: How do you store just pure data within a program? All the commands covered so far are actual commands for the 6502; there's no data command as such. What is available, though, are the *pseudo-ops* or assembler *directives* of your particular assembler. Directives are commands the assembler itself uses (such as ORG and EQU) to control aspects of the final object

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• 6 ALL	•	•	•
• 1 ALMOST	•	•	•
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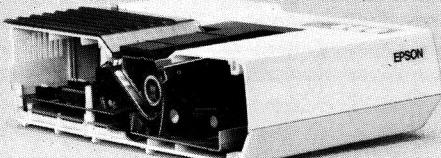
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RIGHT OF ASSEMBLY

Listing 1. Sample data program.

```
1  ****  
2  *      SAMPLE DATA PROGRAM      *  
3  *      8/1/86                  *  
4  *      MERLIN ASSEMBLER        *  
5  ****  
6  *  
7  *      ORG  $300  
8  *  
9  COUT  EQU  $FDED  
10 *  
0300: A2 00 11 START  LDX  #$00      ; START WITH X = 0  
0302: BD 13 03 12 LOOP   LDA  DATA,X  ; READ A BYTE OF  
                           DATA  
0305: 20 ED FD 13 JSR   COUT      ; PRINT ASCII  
                           CHARACTER  
0308: E8 14 INX   X             ; X = X + 1  
0309: E0 05 CPX   #$05      ; DONE WITH LIST?  
030B: 90 F5 BCC   LOOP      ; X < 5 MEANS NO...  
030D: A9 8D LDA   #$8D      ; #$8D = CARRIAGE  
                           RETURN  
030F: 20 ED FD 18 JSR   COUT      ; PRINT IT  
0312: 60 19 EXIT   RTS  
20 *  
0313: C1 D0 D0 21 DATA   HEX   C1D0D0CCCC5  
0316: CC C5 22 *  
23 *      * DATA = 'APPLE'
```

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Listing 2. Listing 1 disassembled.

```
*300L  
0300-  A2 00      LDX  #$00  
0302-  BD 0E 03  LDA  $030E,X  
0305-  20 ED FD  JSR  
0308-  E8          INX  
0309-  E0 05      CPX  #$05  
030B-  90 F5      BCC  $0302  
030D-  60          RTS  
030E-  C1 D0      CMP  ($D0,X)  
0310-  D0 CC      BNE  $02DE  
0312-  C5 00      CMP  $00
```

code during source-listing assembly. Directives vary from one assembler to another, so you'll have to consult your own manual to see how your assembler operates.

Generally, you define a block of one or more bytes of data, then just skip over that block with a branch or jump instruction when you execute your program. You can usually enter data either as hex bytes, or as the ASCII characters you want to use. In that case, the assembler automatically translates the ASCII characters into the proper hex numbers.

Almost all assemblers have a HEX command for directly entering the hex bytes of a data table. **Listing 1** is a sample program that uses the indexed-address mode. This disassembles from the Monitor with a 300L as shown in **Listing 2**.

Listing 2 is an improved version of **Listing 1**, which prints the word APPLE on screen. It uses the indexed-address mode to scan through the data table to print the word APPLE. Notice that when disassembling, data tables can be strangely interpreted to the screen. The Apple has no way of knowing which part of the listing is data and which contains intended 6502 instructions, so tries to list it all as an ordinary machine-language program.

Listing 2 uses the offset of the X register to get successive items from the data table. When the X register reaches 05 (the number of items in the table), you're finished printing and terminate with a carriage return. Remember that in machine language, you must usually do everything yourself; you can't assume an automatic carriage return at the end of a printed string.

Listing 3. Screen-clear program.

```

1  ****
2  *      SCREEN CLEAR PROGRAM #1A      *
3  *          8/1/86                      *
4  *          MERLIN ASSEMBLER          *
5  ****
6  *
7          ORG  $300
8  *
9          PTR   EQU  $06
10  *
0300: A9 04 11  ENTRY    LDA  #$04      ; HIGH ORDER BYTE OF
0302: 85 07 12          STA  PTR+1    ; SET HIGH BYTE OF
0304: A0 00 13          LDY  #$00      ; LOW ORDER BYTE OF
0306: 84 06 14          STY  PTR      ; SET LOW BYTE OF
                                PTR
15          * SETS PTR (6,7) TO $400
0308: A9 A0 16  START   LDA  #$A0      ; ASCII FOR 'SPACE'
030A: 91 06 17  LOOP    STA  (PTR),Y  ; PUT 'SPACE' IN
                                MEMORY
030C: C8 18  INY
030D: D0 FB 19  BNE   LOOP
030F: E6 07 20  NXT    INC  PTR+1    ; PTR GOES FROM $400
                                TO $500
0311: C9 08 21  CMP   #$08      ; STOP WHEN PTR =
                                $800
0313: 90 F3 22  BCC   START
0315: 60 23  EXIT   RTS

```

Note: The hex values in the data table are the ASCII values for each letter plus \$80. (See the ASCII-character chart in the June 1986 *inCider*, p. 92.) This sets the high bit of each number, which is what the Apple expects in order to print the letter properly when using COUT.

You use the indirect-addressing modes when you want to access memory locations in a very compact and efficient way. Consider the problem of clearing the screen, for instance. To clear the screen, you put a space character into every memory location in the screen block (\$400-\$7FF). **Listing 3** illustrates one way to do it.

The program starts by initializing locations \$06 and \$07 to hold the base address of \$400, the first byte of the screen-memory area. It then enters a loop that runs the Y register from \$00 to \$FF. Since this is added to the base address in \$06,07, it stores an \$A0 (a space) in every location from \$400 to \$4FF. When Y is incremented from \$FF, it goes back to \$00, which is detected by the BNE on line 18.

When Y reaches zero it falls through, and increments location \$07 from \$04 to \$05, giving a new base address of \$500. This entire process repeats until location \$07 reaches a value of \$08 (corresponding to a base address of \$800), at which point the program returns from the routine.

By changing the value of `#$A0` to some other character, you can clear the screen to any character you like. In fact, you can get the value from the keyboard as in earlier programs. The program in **Listing 4** is a revised version of **Listing 3**.

Enter and run this program from BASIC with a CALL 768. Each key press clears the screen to a different character. The screen should also clear to the same character as the key you press, including the space bar and special characters. In this program especially you can see just how fast machine language is. Clearing the screen requires loading more than 1000 different locations with the given value. This would be quite slow in Applesoft, but here you'll find the screen clears to different characters as fast as you can type them.



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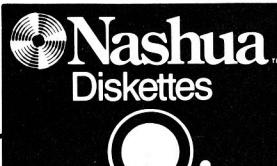
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RIGHT OF ASSEMBLY

Listing 4. Revised screen-clear program.

```

1  ****
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3  *      8/1/86                      *
4  *      MERLIN ASSEMBLER          *
5  ****
6  *
7  ORG  $300
8  *
9  PTR   EQU  $06      ; PTR = $06,07
10 CHAR  EQU  $08
11 KYBD  EQU  $C000
12 STROBE EQU  $C010
13 *
14 ENTRY  LDA  #$04      ; HIGH ORDER BYTE OF
15      STA  PTR+1      ; SET HIGH BYTE OF
16      LDY  #$00      ; LOW ORDER BYTE OF
17      STY  PTR      ; SET LOW BYTE OF
18      * SETS PTR (6,7) TO $400
19 READ   LDA  KYBD      ; GET KYBD CHARACTER
20      CMP  #$80      ; KEYPRESS?
21      BCC  READ      ; NO, THEN TRY
22      STA  STROBE      ; CLEAR KYBD STROBE.
23      STA  CHAR      ; SAVE CHARACTER
24      CLEAR  LDY  #$00      ; SET Y = 0
25      LDA  CHAR      ; GET CHAR TO
26      LOOP  STA  (PTR),Y      ; 'CLEAR' TO
27      INY   BNE  LOOP      ; Y = Y + 1
28      BNE  LOOP      ; BRANCH WHILE Y =
29      INC   PTR+1      ; PTR GOES FROM $400
30      CMP  #$08      ; TO $500
31      BCC  CLEAR      ; STOP WHEN PTR =
32      JMP   ENTRY      ; NOT THERE YET
33      AGAIN  JMP   AGAIN      ; INFINITE LOOP

```

An interesting variation on this is to enter graphics mode by typing in GR before calling the routine. The screen will clear to different colors and line patterns.

This second variation uses the principles we covered in the June Right of Assembly (p. 91) of reading the keyboard (\$C000) until it gets a value greater than \$80, which means that a key has been pressed. The program then temporarily holds this value in the variable CHAR so that it can retrieve it each time after incrementing PTR in the NXT section.

See what variations you can make on this, or try the hi-res screen (\$2000-\$3FFF). See you soon! ■

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

Continued from p. 35.

Diamond automatically calculates many categories from other fields. Besides typical stats like batting averages and earned-run averages, Diamond figures on-base percentage for hitters and strike-out average for pitchers. It gives switch hitters a breakdown of their performance from each side of the plate. The program even allows for ten user-defined statistics.

The team-information module handles the names and addresses of the manager and up to five coaches, maintains a 50-game schedule, tracks car-pool assignments, and keeps a modified equipment list and the team's win/loss totals.

The car-pooling segment is particularly well done. It allows for information on the driver and up to eight passengers per car, including each person's telephone number. The equipment list is somewhat limited, since you can list only eight major areas. You can note individual bat sizes in a separate section of the form, though, and print hard copies of all your information.

What's the Score?

Keeping score as games are played is one of Diamond's major functions. If you can bring your computer to games, you'll love this portion of Diamond.

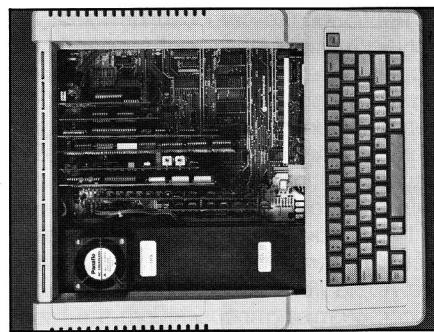
The game-scoring module is very flexible when you're substituting players, creating lineups (including designated hitter), and entering play-by-play results (in most cases, just one key-stroke per result). The program displays all results on screen, three innings at a time.

After scoring a complete game, Diamond automatically updates offensive, defensive, and pitching statistics on your team-stats disk—you don't have to retype the results. You can print box and line scores, as well as team or individual player stats.

Diamond is easy to use, but you should plan to spend a few hours learning the program first (more if you're using the game-scoring option).

Diamond does an excellent job of integrating information. For example, once you've assigned a player a roster number, that number is all you need to create a lineup or start a car pool. Overall, Diamond is a very strong package. ■

James V. Trunzo
Leechburg, PA

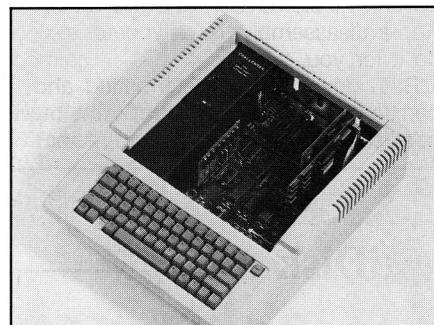


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I tested two 20-megabyte internal hard disks, Space Coast Systems'



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Challenger and CMC Computer Systems' Quick-20, and found them fast and convenient—but fraught with some annoying compromises as well.

Under the Hood

If you're too timid to take your Apple apart, neither of these drives is for you. Installing either one requires complete disassembly, not just the top-popping with which you may be comfortable: The hard disk fits into your machine in place of your current power supply. The Quick-20 even obliges you to temporarily remove the keyboard to mount an intermediate interface board on a new bracket below it.

Of the two, the Challenger is marginally easier to install. After bolting it in, you simply route its cable along the Apple's motherboard and connect it to the interface card in slot 7.

While that sounds simple enough, some unforeseen difficulties cropped up when I tried it. The interface cable on the first Challenger I received wasn't long enough to reach the card

in slot 7. As the card can be used only in that slot, the drive (and my Apple, since I refused to reinstall the power supply and reassemble the computer only to tear it apart later) were effectively useless during the ten days it took Space Coast Systems to ship a replacement.

The Quick-20's problem is more obvious: It won't fit into early versions of the Apple IIe and II Plus without an uncompromising intrusion into the keyboard area. I strongly recommend you check with your dealer or call CMC directly to find out if your Apple is physically compatible with the Quick-20.

Otherwise, if you feel capable of installing either drive, you probably can. The added inconvenience of the Quick-20's intermediate board is conceptual rather than real. But if you haven't mastered Zen and the art of Apple disassembly, have your dealer do it for you.

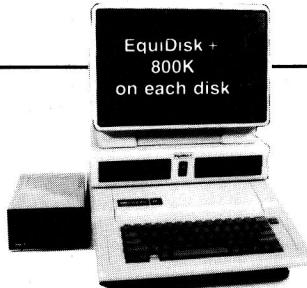
Both drives came preformatted and partitioned (when applicable) with boot software already installed. After

using the Sider's installation software, I felt an uncomfortable amount of early-Apple *déjà vu* with the internal drives' user-futile programs. CMC gets bonus points for the Mouse Desk windowing software it supplies with the Quick-20, though. It makes operating in the hard-disk environment much simpler.

As a whole, the installation software for both drives appears to be derived from some warped interpretation of what a multi-user system might be if one existed for the Apple II. In lieu of a Sider-like boot menu, needless passwords and user names abound. The installation process takes as much effort as putting an Apple into a Corvus OmniNet, without the benefits of the latter's multi-access capabilities.

One-Man Band

From conversations with both companies, I can't help but assume they're conceptual "one-man" operations (not that only one person works there, but you won't get very far if "the" important person is busy).



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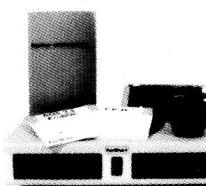
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When I called Space Coast about a new interface card, which arrived unannounced and promised ProFile compatibility (a \$200-plus invoice appeared shortly thereafter), the person I needed was unavailable throughout the day, and there was no information to be gleaned elsewhere. A CMC answering machine greeted one of my calls, but someone did call back the same day.

There are negligible differences between the drives in terms of speed. You must install the interface cards in a particular slot (Challenger 7, Quick-20 6), so ProDOS doesn't need to search for them through every slot. I found this feature only moderately beneficial.

When the Challenger's first cable was too short, I hoped to gain a working drive and computer by trying the interface card in slot 6. No such luck. ProDOS insisted the hard drive was in slot 7 and couldn't resolve the conflicts engendered by having it actually in slot 6.

Also, the Challenger "disappeared"

once in a while when I worked from a subdirectory on my 3½-inch drive. That subdirectory's pathname was /TESTS/PROGRAMS, and the Challenger's volume name was /PROGRAMS. These two pathnames are distinct under ProDOS, and this problem shouldn't have occurred.

As for the hard disks' documentation, those of you who have read other reviews I've written will know that I can abide quite a few deficiencies in hardware and software, providing there's a clear, concise manual to explain how to surmount them. Neither manual meets my standards.

The Challenger documentation, although profusely illustrated, reads as if it were written by someone who uses English as a second language. The CMC manual is quite eloquent, but devoid of illustrations. Considering that the Quick-20's installation is more complicated, this is a serious shortcoming.

Hardly State of the Art

Both of these drives seem aimed at

the ProDOS-only user, specifically the AppleWorks user. Given the confusing installation software, I'd hate to start playing with DOS 3.3 or CP/M partitions.

The extra speed and storage of a hard disk have their price. These drives double the weight of your computer. And just like external hard disks, they're susceptible to shocks and bouncing—unavoidable occurrences if you carry your Apple around.

In addition, whichever drive you choose, I feel you must add a cooling fan. There's simply too much heat circulating inside your Apple, even with the fans contained in the hard disks themselves.

Given the current trends in hard-disk technology, an internal hard disk for the Apple II is a good idea. Unfortunately, the Challenger and Quick-20 aren't the best possible examples of that technology.

If someone is going to introduce an internal hard disk, I'd prefer it to be on a card that plugs directly into an

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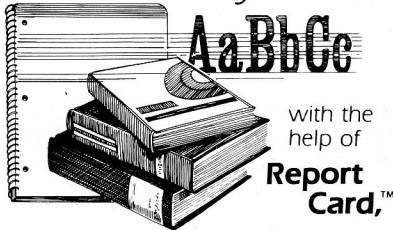
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REVIEWS

Apple slot. That's possible with 3½-inch drive technology and surface-mount chip techniques. You'd also need a beefier power supply to support the system, but with 1-megabyte-plus memory cards, that's not such a bad idea anyway. ■

Bill O'Brien
Fort Lee, NJ

Editor's note: CMC's Charles McConathy responds that his firm recommends customers buy one of CMC's external hard disks; when a buyer does request a Quick-20, CMC suggests the dealer install it. He adds that the drive is now bundled with ProSEL instead of Mouse Desk menu software, that the ProDOS version connects to any slot, and that tests with a Quick-20 and an Apple full of cards produced no overheating (see Letters in next month's inCider for further details).

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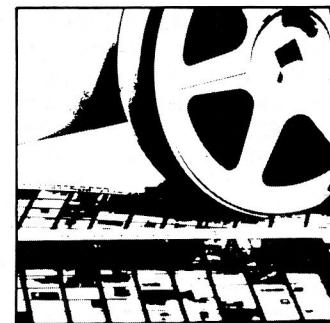
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Documentation	■■■■■
Support	■■■■■
Overall	■■■■■

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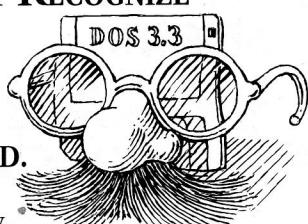
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Fixit gives you 200 machines to repair, and all of them do the same job. You drop a bolt into the machine, which conducts it to a hole in a box at the other end. Kit 001 consists solely of the wrench that drops the bolt and the box into which it fits.

The kits get progressively more complex, though, requiring you to complete them with various "parts" shown at the bottom of the screen. Elbows turn the bolt 90 degrees in its flight. Converters change the bolts from large to small and hollow to solid. Bouncers reverse the direction of the bolt's travel. Finally, the bolt must cross keys to unlock the box, and some of the parts change property after a bolt touches them.

The main principle of the machine is that the bolt, as it reaches the box, must conform to the size, color, and solidity of the hole. That's where your diverse collection of parts comes in: All you have to do is figure out how to assemble them to get the bolt into the box.

Exercising Your Intellect

The first 50 kits or so comprise a tutorial of sorts, demonstrating how each part works. You learn how to place the parts, what they do, and how to turn them (90 degrees at a time) to change the direction of the bolt.

You'll also discover that this game has more than a few curves to throw at you. One of the worst is finding parts on screen that you don't need to complete the kit. You have to become an expert in charting the flow of the bolt so that you can recognize which parts just complicate the problem and which are indispensable in fixing the kit.

When you've completed a kit, you can test it by dropping the bolt to see if it flies into the box. If you've grabbed the wrong part or if it's pointing in the wrong direction, you can move or turn it. The parts you see on screen when the kit is first displayed won't move, though. Since you're stuck with those, learn to be ingenious.

If you manage to solve all 200 kits, you can then design your own as puzzles for others to try, and add them to the permanent collection on disk. If you like, you can also go back and try to beat your best times for solving Fixit's kits. After 200 of them, you'll be surprised how many solutions you forget entirely, making the experience fresh and new.

Not only is Fixit a great game for the mechanically minded, it's a real find for those who want to improve their reasoning skills, as it requires pure thinking. Children will make slower progress than adults, but the kits' difficulty increases at such a gradual pace that most older children should be able to advance.

For adults, Fixit is pure fun—puzzles for their own sake, a vigorous workout for the intellect. You come away from the game mentally refreshed and stimulated. What more could you ask? ■

*Brian J. Murphy
Fairfield, CT*

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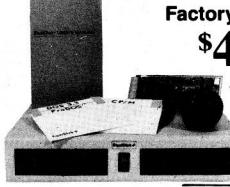
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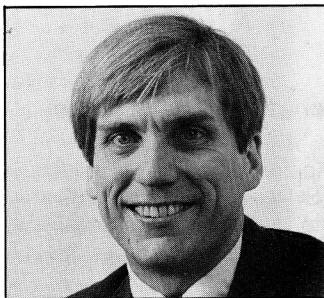
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STATTUS REPORT



Knowledge

"You may have bought an Apple just to turn data into information. Can the same machine make knowledge out of information?"

by Paul Statt, *inCider* staff

In the CIA, *intelligence* is synonymous with *information*. Anywhere else, intelligence means more than a collection of facts—such as names, telephone numbers, or the number of Soviet missiles in Libya. To most of us, intelligence *isn't* mere information; it's the process that turns information into *knowledge*.

Information begins as a collection of related data or facts; organizing them works them into information. You may have bought an Apple just to turn data into information. Can the same machine make knowledge out of information?

A revolution in information is said to be raging. There certainly is more of it: a CD-ROM storage device, for example, can keep the Library of Congress' catalogue or the *Oxford English Dictionary* in your pocket.

"We're working on several new revolutions for '87," the manufacturer of a bar-code reader told me. His device will "change the way we look at knowledge," he claims. Maybe. Knowledge isn't that simple.

Data are simple: \$10,000, \$20,000, \$30,000.

But data by themselves don't mean very much. Put them into a little chart, though, give them some form, and you've got information:

	1984	1985	1986
Income	\$10,000	\$20,000	\$30,000

That makes more sense now—but it really comes to life only in context. Filling in the context ("Gee! Two years ago I wasn't making half the salary I'm getting now") is the process called intelligence, and the result is knowledge.

Your Apple's best trick is putting data into a hat and pulling out information: Data bases organize your data neatly; spreadsheets put them into charts. The metamorphosis of data into information doesn't look like much in my simple example—only when you're dealing with lots of data does it become exciting.

But your data base and spreadsheet can't put information into context—transform it into knowledge. Software can't create

knowledge by piling up information. More information—on a CD-ROM disk, in an on-line data base, or even in a book—won't become knowledge, just as sowing millions of seeds in a field won't grow a forest. Knowledge is the forest you can't see for the trees—all those bits of information.

Artificial intelligence promises "knowledge-based systems" that will do just what I've always insisted computers can't—pull knowledge out of the information your spreadsheet or data base took from your facts.

CD-ROM will use artificial intelligence to do for information what a spreadsheet does for data: transform it into a more intelligible shape.

The intelligent part of a CD-ROM system is *retrieval software*, the program that jumps into your CD-ROM data base and saves your information from drowning. (Remember that CD-ROM offers a sea of data 3000 floppy disks deep.)

Retrieval software drops crumbs on the path as you stumble through a jungle of information. It lets you trace your steps, and, if it's "intelligent," can remember how you thought, which items you found interesting—your personal style of reading the dictionary, for instance. This software could actually take some halting, but intelligent, steps toward knowledge.

Writing this column, I checked the words *data* and *knowledge* in Webster's. It wouldn't take much in the way of retrieval software to print their definitions from a CD-ROM dictionary: A data-base manager could do that.

But I want retrieval software that can pick up details the way I do: notice that *knowledge* is an old word, common in the 12th century A.D., while *data* was first spoken in English in 1646. It might notice that *knowledge* is pure Anglo-Saxon, *data* nothing but Latin. Next time, when I'm checking *killing* and *euthanasia*, my retrieval software would notice a similar distinction and give me something to think about: We seem to speak English when we know what we're saying and Latin when we're unsure or have something to hide.

More information isn't what I'm after—it's more intelligence. It's great that so much information is available—but I'd really like to see some thinking software. ■

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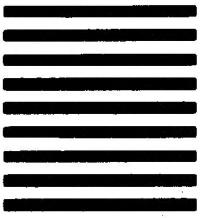
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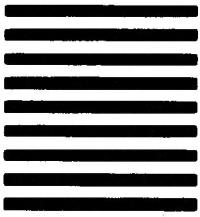
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THE APPLE II MAGAZINE

GAME ROOM



Move your troops through jungles and villages in Nam.

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.

inCider's Ratings

★★★★★	Excellent
★★★★	Above average
★★★	Good enough
★	Not up to standards
☆	The empty set

Do you live for the thrill of combat? Does the smell of napalm in the morning remind you of victory? Do you long to don belts of machine-gun ammo and, like Rambo, wade into the Commie hordes with leaden death spewing from the white-hot mouth of your machine gun?

If your answer to those questions is yes, there's not much I can do to help you, because this month's featured games—**Nam** and **Panzer Grenadier**—only simulate those experiences.

But even without real blood, gore, danger, and death, they're still a lot of fun. On the other hand, there's **Battle Group**, a game that could give war and devastation a bad name.

But enough ironic commentary—battle calls! Forward to Nam! Backward to Panzer Grenadier!

Nam

★★★

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Panzer Grenadier

★★★

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From the point of view of ease of play and speed of execution, Nam and Panzer Grenadier are among the best tactical simulations I've seen. Instead of the hunt-and-peck process of other



Command German patrols in Panzer Grenadier.

war games' keyboard commands, these games are set up along the lines of an Atari or arcade battle. Joystick control of unit movements and combat decisions keeps the game moving along rapidly.

Each game offers a series of historic small-unit battles from their respective conflicts—Vietnam and World War II. Weapons and vehicles of the period are meticulously simulated.

In Panzer Grenadier you command German armor and infantry in a series of set-piece skirmishes with Red Army forces. In Nam you control American and South Vietnamese infantry, armor, and helicopter units against Viet Cong guerillas and North Vietnamese regulars.

While each scenario offers highly entertaining problems in tactics, terrain, and the use of firepower, the games' best feature is the joystick-control system. During the "movement" phase of a turn, you place a box cursor over the unit you want to move and activate it with a press of the fire button. The cursor turns

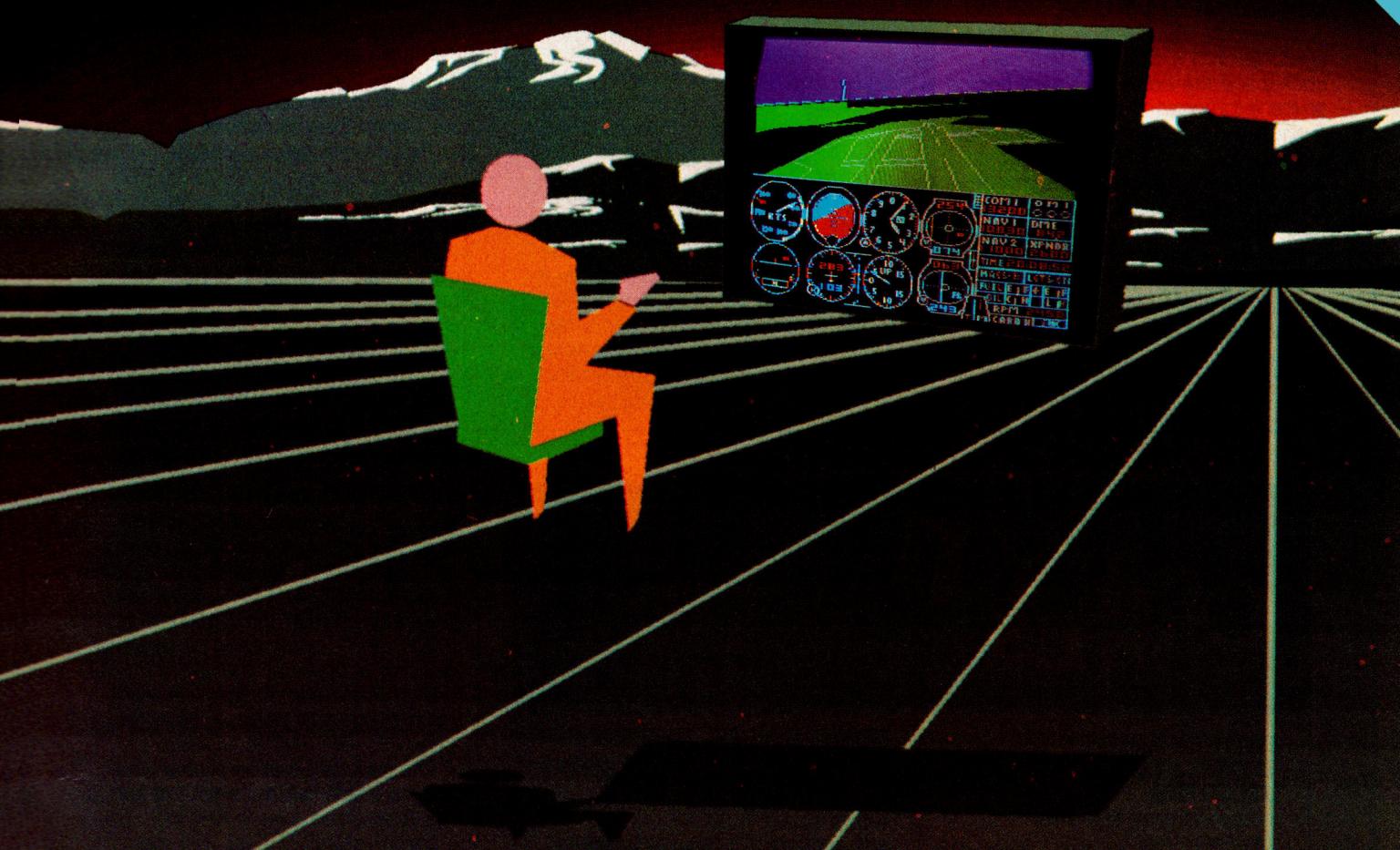
green to indicate the unit is ready to go, changing to orange as the unit reaches its limit of endurance. To assault an enemy position, you again place the cursor over the unit and move it into the enemy space. Combat results are displayed automatically.

During the "fire" phase of the turn, you place your cursor over the friendly unit and press the fire button. A cross-hairs appears in the cursor. Move the box over the target, press the fire button again, and the game reports one of four results—"Target Missed," "Target Hit," "Out of Range," or "No Line of Sight" (terrain or buildings between you and the target).

Of course, the enemy has his innings, too. He won't just sit there while you move, nor will he hold his fire while your troops sit in plain sight in some field. Roger Damon has programmed both games to offer vigorous opposition from wily, aggressive, uncannily accurate gunners. Accordingly, a few tips on strategy are in order.

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Do battle with armor and infantry in Battle Group.

Tip One: Keep your units under cover. Houses, trees, and brush (all indicated by the map graphics) reduce the probability of your unit's being spotted and sustaining damage.

Tip Two: Concentrate fire on the nearest enemies. Except for artillery, the closest enemies are the most dangerous—but also the easiest to eliminate.

Tip Three: Avoid attacks (the fighting that occurs when you move a unit onto an enemy unit, causing hand-to-hand combat). Assaulting enemy positions is the quickest way to weaken your troops to the point of elimination. If you concentrate your fire at the nearest enemy units you'll inflict maximum damage with minimum losses.

Tip Four: Don't move weakened units close to strong enemy units. Enemy fire could eliminate your unit when it gets up and tries to move.

Nam and Panzer Grenadier offer entertaining war gaming. The games take no time at all to learn and are very simple to operate, thus keeping the emphasis on strategy and action. This can't be said of Battle Group.

it to, Battle Group and its ancestor, Kampfgruppe, seem exceptionally unsatisfying. While all three programs in this month's Game Room are simulations of armor/infantry battles, Gary Grigsby's design for Battle Group is far inferior to Damon's for Nam and Grenadier.

Battle Group's complex game turns and reliance on keyboard commands make troop movement less precise, while combat results are less satisfying and exciting. It takes several steps to move a unit, to direct it toward the enemy, to aim at a target, and so forth. Commands specifying unit facings, speed, and so forth seem completely unnecessary.

It seems to me that the emphasis in Battle Group is on making the management of the battle as complicated as possible. Compared to Nam and Panzer Grenadier, my choices for the best small-unit war games for Apple, Battle Group and Kampfgruppe make me wonder if SSI rates a game "advanced" on the basis of its complicated commands or its play value and challenge. ■

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.

Battle Group

★★

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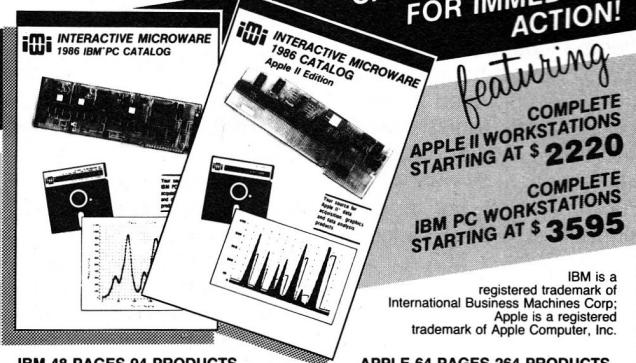
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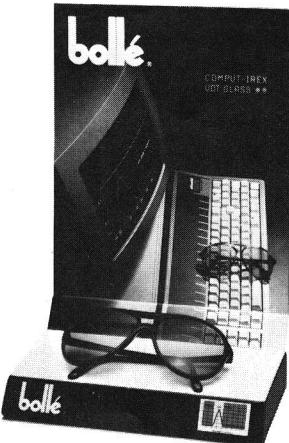
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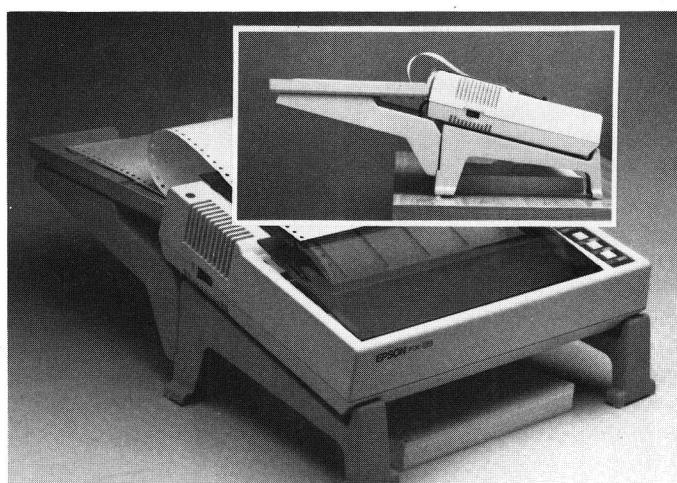
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The Write Stuff

Writer's Helper is a collection of programs designed to help students **organize ideas**, and put those ideas in writing. Writer's Helper works with standard ASCII text files and Bank Street Writer. Both DOS 3.3 and ProDOS versions are on the disk. Write to Conduit, University of Iowa, Oakdale Campus, Iowa City, IA 52242, (319) 353-5789, or circle Reader Service number 371 for more information.

Historic Battles

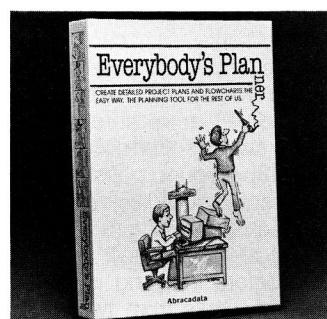
Conflict in Vietnam follows five separate battles that were pivotal in the **war in Vietnam**. Conflict in Vietnam is the third in Microsoft's Command Series, which includes Crusade in Europe and Decision in the Desert. The simulations retail for \$39.95 each, from Microsoft Software, 120 Lakefront Drive, Hunt Valley, MD 21030, (301) 667-1151. For more information, circle Reader Service number 358.

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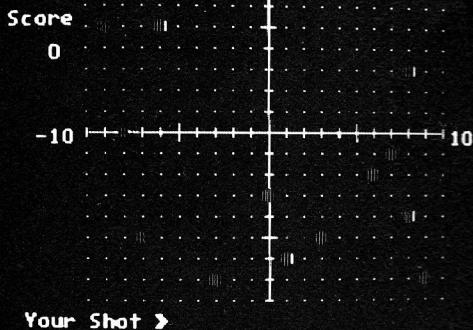
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Keep track of your projects with Everybody's Planner, a **planning tool** with two complete programs—Schedules and Flowcharts. The package features pull-down menus, quick command cards, and two simple tutorials. Plans for your project can be up to five years long, using as many as six screens for your schedule. Everybody's Planner retails for \$99.95, from Abracadabla, P.O. Box 2352, Eugene, OR 97402, (503) 342-3030. Circle Reader Service number 355 for more information.



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Green Globs and Graphing Equations is a collection of four programs that provide students with new ways to learn **trigonometric and algebraic functions**. Green Globs challenges students to write equations for graphs that will hit as many of the 13 "green globes" on the screen as possible. The other programs—Tracker, Linear and Quadratic Graphs, and Equation Plotter—cover other algebraic functions. The set is priced at \$59, from Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, (914) 769-5030. Circle Reader Service number 359 for more information.

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Hypnosis produces optical and auditory stimulation to aid in suggestive relaxation, behavior modification, and **trance induction**. Designed for professionals and students of the medical and psychological uses of hypnotic trance, Hypnosis is \$20, from Audent, 1000 North Avenue, Waukegan, IL 60085, (312) 223-5077. Circle Reader Service number 357 for more information.

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Catch your mistakes for \$49.95 (plus \$2 shipping), from Quorum, P.O. Box 2134WCF, Oakland, CA 94621, (800) 222-2824, (800) 222-2812 within California. Circle Reader Service number 356 for more information.

Get On Line

If you use AppleWorks, you can use CommWorks. This new **telecommunications** package lets you save frequently used communications parameters and offers automatic log-on, macro commands, and a text editor, all guided by the familiar folder-menu interface. CommWorks is compatible with most popular modems, and works with Jeeves and Catalyst 3.0. CommWorks is available for \$95 from PBI Software, 1111 Triton Drive, Foster City, CA 94404, (415) 349-8765. For more information, circle Reader Service number 352.

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Pascal programmers can now **customize text** according to any specifications or print style. *Form handles documents of any size for any printer, with such formatting features as margins, justification, titles, footnotes, tabbing, indexing, multiple columns, underlining, boldface, superscript, and subscript. The text editor with formatter is \$34 (\$75 with source code), from dogStar Software, P.O. Box 302, Bloomington, IN 47402, (812) 333-5616. For more information, circle Reader Service number 354.

Resources

Apple SIG

The Source is offering a new **Apple special-interest group (SIG)** featuring product reviews, free software available for downloading, special bulletin boards, an Apple bulletin-board directory, and other information of interest to Apple II users. The price of accessing SIGs on The Source starts at 10 cents per minute (\$6 per hour), plus the usual Source membership fee of \$49.95. Software on the Apple SIG can be downloaded with Kermit/Super Kermit protocol, and soon with XModem. For more information, contact Source Telecomputing Corporation, 1616 Anderson Road, McLean, VA 22102, (800) 336-3366, or circle Reader Service number 365.

The Hidden Editor

Spellbound, a **spelling checker** that fits on your AppleWorks disk, can fix errors before you even know you made them. An Autopilot feature automatically swaps incorrect words with Spellbound's first guess; if you'd like more control, the program will suggest a corrected spelling before inserting it. Spellbound works from two word lists—most frequently used and most frequently misspelled English words.

Product Updates

- Worksheet Wizard I: Whole Numbers has two new companions—**Worksheet Wizard II: Fractions** and **Worksheet Wizard III: Decimals**.

These worksheet generators let students practice their skills in each area. Contact EduSoft, P.O. Box 2560, Berkeley, CA 94702, (800) EDU-SOFT (415-548-2304 from California, Hawaii, or Arkansas).

• **Super BoulderDash** includes the original BoulderDash arcade game and the sequel, BoulderDash II. Rockford, the sneaker-clad hero of the game, has 16 new caves to explore at five levels. This arcade avalanche is from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171.

• AV Systems' new series, **Apple Tree User Systems**, includes 48 games, simulations, and educational programs per disk, all for \$9.95 each. Every disk comes with a ten-day free trial and free site licensing for schools. Contact Adrian Vance, AV Systems, P.O. Box 49210, Los Angeles, CA 90049, (213) 476-3311.

• The PFS series is now bundled in one convenient, integrated package. **PFS:Workmates** includes PFS:Write (with integrated spelling checker), File, Report, and Plan. Programs come on 5½-inch disks or on one 3½-inch disk, from Software Publishing, 1901 Landings Drive, Mountain View, CA 94039, (415) 962-8910.

• Desktop accessories have been added to Artsci's word processor Magic Window //e. With **Magic Window //extra**, you can access a calculator, notepad, card filer, calendar, scheduler, and telecommunications module while the program is running. And all your old files are compatible with the new disk. Contact Artsci, 5547 North Satusma Avenue, North Hollywood, CA 91601, (818) 985-2922.

• Isolated information professionals can benefit from peer interaction on the **Network of Online Professionals**. It's open to any experienced information professional who frequently uses on-line data bases. You can access the network on Dialmail, the Dialog E-mail service, and the only cost is Dialmail connect time. For details contact John Everett at P.O. Box 157007, Irving, TX 75015, (214) 253-9311.

• **DavkaGraphics** contains 63 symbols of Jewish life to use with Broderbund's Print Shop. Pictures on the disk cover a wide range of subjects and include such items as a map of Israel and drawings of a Hasid, Sabbath candles, and a Kiddush cup. DavkaGraphics also contains a Hebrew font you can use with Print Shop Companion modifications. Contact Davka, 845 North Michigan Avenue, Chicago, IL 60611, (312) 944-4070.

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HINTS/TECHNIQUES

Apple users know that there's always an easier way to get the job done. A shortcut here, an elegant twist there. That's what *Hints/Techniques* is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night. So read on and see if you don't find just the solution you've been looking for.

Computed GOTO's

by Arthur Levesque

Even beginning Applesoft programmers are familiar with the GOTO statement. GOTO transfers control of the program to the line following the statement, to make branching and loops possible. If you're an old-timer, you'll recall that Integer BASIC, which was built into pre-1978 Apple II's, included a Computed GOTO statement. Now, with the help of an ampersand utility, you can add Computed GOTO's to Applesoft.

First type in and save **Listing 1** as a text file. Then to use Computed GOTO's in your programs, type EXEC GOTO after booting the disk to which you saved the utility. This loads the routine as an Applesoft subroutine that becomes part of any Applesoft program you write.

Line 5 calls the routine, which resides in lines 50000 through 50010 (be sure you don't use those line numbers in your programs). When you RUN a program containing the Computed GOTO subroutine, the program POKEs the routine into memory before executing other instructions.

The general form of the Computed GOTO is &GOTO expression, where expression is a numeric variable, such

as X1 or COUNT, or an arithmetic expression, such as 500-X. In many instances, Computed GOTO's are much simpler to use than the Applesoft ON GOTO statement. Computed GOTO's can also make your programs easier to read and understand: You can GOTO named subroutines, such as &GOTO SCORE and &GOTO END, then identify them with REM statements. ■

Write to Arthur Levesque at 60 Homestead Avenue, North Smithfield, RI 02895.

GET Enhancement

by John T. White

One of the most useful programming commands in Applesoft BASIC is the GET statement. You can use it to accommodate a number of user actions—everything from "press any key to continue" to multiple-choice test-answer selections.

GET's primary function is to stop a running program and wait for a single key press. In string form (such as GET A\$), hitting any single key will make program execution continue. Unlike the INPUT command, GET doesn't require you to hit the return key.

Two types of computer users foil the good intentions of even the most dedicated programmer, though. First, there's the "nervous newcomer," who often ends up doing a "stutter step" on a selected key. This not only satisfies the present GET command, but deposits the extra key presses in the keyboard buffer (a temporary storage area). If your computer encounters another GET statement, these characters are more than happy to override the intended pause. In the blink of an eye, whatever you were supposed to see is gone.

Listing 1. Computed GOTO for Applesoft.

```
5 GOSUB 50000
50000 FOR N = 0 TO 13: READ P: POKE 768 + N, P: NEXT
50001 DATA 169, 171, 32, 192, 222, 32, 103, 221, 32, 82, 231, 76, 65, 217
50005 FOR N = 0 TO 2: READ P: POKE 1013 + N, P: NEXT
50010 DATA 76, 0, 3: RETURN
```

The second abuser is the "bored know-it-all." This person gets tired of waiting: His impatience brings about the same result.

When programming for others, it's a good idea to anticipate possible problems. To wipe out any stray characters that might trigger premature program continuation, insert the line POKE 49168,0 (or POKE -16368,0, if you prefer negative numbers) before each GET statement. This one simple addition clears the keyboard buffer just before GET halts the program's action. ■

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

Improving TIME

by Frank Brown

The TIME file on Apple's BASIC Programming with ProDOS /EXAMPLES disk (in the /EXTRAS directory) is the seed for a great start-up program for Apples without clock cards.

Since the time and date are lost on reboot or power-off, it's useful to run the program regularly after turning your computer on. Renaming the program Startup and saving it to a ProDOS disk will make BASIC.SYSTEM automatically run the program on boot, thus ensuring that all files will be date- and time-stamped when you save them.

By changing a few lines, you can greatly enhance the program's operation. With these modifications, your Apple will accept lowercase input while setting the date, let you skip setting the time, and give you a catalog each time you boot the disk.

One of the improvements Apple made to both ProDOS and Applesoft ROM was allowing lowercase keyboard input—but its own program to set time and date refuses to accept lowercase input when asking for the month. To remedy this needlessly frustrating situation, simply change TIME's line 585 to the following:

```
585 GET A$: IF ASC(A$) > 90 THEN
      A$ = CHR$(ASC(A$) - 32)
586 M1$ = M1$ + A$: ? A$; MM = 4
```

Now, wouldn't it be nice if your Apple didn't ask you if you wanted to

reset the date and time every single time you ran BASIC.SYSTEM? Shouldn't your machine "know" whether or not you've already set the date?

Of course it should. Adding the following lines to the beginning of TIME gives your Apple the ability to check:

```
5 YY = INT (PEEK (49041) / 2): IF
  YY < > 0 THEN 1345
1345 ? CHR$(4); "PR#3":?CHR$(4);
  "CATALOG,TDIR"
```

If you haven't set the date and time, the program will offer you that option. If you have, the program will assume you don't want to reset them and give you a disk catalog (or whatever else you may have programmed in at line 1345). ProDOS lets you use the T option to specify catalogs of files of particular types. (I use the syntax TDIR on my hard disk to list only subdirectory files.)

The escape key has become a common way of exiting from programs. The following lines let the program accept this key as well as N as a negative response to the question SET DATE & TIME? and let you exit leaving the time unset. After you answer Y to CORRECT (Y/N)?, hitting the escape key tells the program you don't want to set the time. (It will display 0:00 in the ProDOS catalog.) We'll program this by adding lines 505, 925, and 1265, and changing line 920:

```
505 IF A$ = CHR$(27) THEN 1345
920 GET A$: IF A$ = CHR$(27) THEN
  SKP = 1: GOTO 1240
925 IF (A$ < "0") OR (A$ > "1")
  GOTO 910
1265 IF SK THEN GOTO 1345
```

CHR\$(27) is the ASCII code for the escape key. Line 920 checks to see if you've pressed it; if you have, a flag called SKP is set, and the program bypasses the set-time routine and goes to line 1240, the beginning of the routine that updates the system date. Line 1265 checks to see if SKP is set; if it is, the program won't try to set the time, but instead jumps to your ending instruction (in this case, the CATALOG command).

These simple changes add up to a pretty decent start-up program. Now whenever you save files, your Apple will include the date and time, some useful bits of catalog information for comparing files. ■

Write to Frank Brown at 911 St. Michael, Tallahassee, FL 32301.

ProDOS Portal

by David O. Bone

In the December 1985 issue of *inCider* (p. 150), Brian Parry released an updated 80-column version of his window routine—Portal2E for Apple //e users. It's a great DOS 3.3 routine, but when you use it with Apple ProDOS, closing a window makes your disk drives cycle. In addition, when you issue a DOS command, the object code in memory is history.

To modify it for ProDOS use, first type in Portal2E from the December issue, or BLOAD it from your disk. Add **Listing 2** and BSAVE it as PRO.PORTAL.OBJ,A\$7BFA,L\$1E3. Then use ProDOS Filer to convert it to ProDOS format. Make the changes shown in **Listing 3** to December's Portal2E demo BASIC program to complete the conversion (for unenhanced //e's only).

If you'd like to create a blank window without an inverse border, POKE 32103,132 before you issue the open command. To reinstate the inverse border, POKE 32103,128. To perma-

nently erase the inverse border, add line 7D66: 20 84 FE to **Listing 2** before the BSAVE command.

When your computer draws a single-line box inside a noninverse-bordered window from BASIC, you lose the effect of a quick window because of the time involved in drawing the box and filling it with text. To get a fast-opening window with a single line around it, start again with the original Portal2E OBJ. Add **Listing 4** to it, and BSAVE it as object file PRO.PORTAL.OBJ,A\$7B90,L\$024C. Convert it to ProDOS, modify the BASIC demo program as outlined above, and you have a quick, clean, single-outline window.

Both these modifications not only allow ProDOS usage, but will set HI-MEM and the buffers necessary to

Listing 2. Portal2E ProDOS patch.

7BFA-	A9	1F	20	F5	BE	60	18
7C96-	60	00	00	00			

Listing 3. Portal2E demo ProDOS patch.

```
100 PRINT CHR$(4); "-PRO.PORTAL.OBJ": POKE 1014,0: POKE 1015,124
110 PRINT CHR$(4); "PR#3": PRINT": POKE 768,0
```

Listing 4. Portal2E ProDOS patch to produce quick single-outline windows.

7B90-	A9	1F	20	F5	BE	60	00	00
7B98-	A5	20	6D	02	03	8D	05	03
7BA0-	CE	05	03	CE	05	03	CE	05
7BA8-	03	AD	03	03	20	C1	FB	A9
7BB0-	DF	A4	20	C8	20	EF	7B	AD
7BB8-	03	03	6D	04	03	8D	07	03
7BC0-	CE	07	03	AD	07	03	20	C1
7BC8-	FB	CE	02	03	A4	20	A9	DF
7BD0-	20	EF	7B	AE	03	03	E8	8A
7BD8-	20	C1	FB	A9	FC	A4	20	20
7BE0-	F2	CE	AC	05	03	20	F2	CE
7BE8-	EC	07	03	90	E9	60	00	20
7BF0-	F2	CE	C8	CC	05	03	90	F7
7BF8-	60	00	00					
7C96-	60	00	00	00				
7D66-	20	58	FC	20	98	7B	4C	6F
7D81-	4C	87	7D					

protect the object program. You can also run or chain various BASIC programs and open data files without resetting the window program. ■

Write to David Bone at 827 Columbine Street, Sterling, CO 80751.

Transfer

by Harold D. Portnoy

The accompanying program, Transfer (see **Listing 5**), gives you a convenient way to transfer selected files from disk to the ProDOS RAM drive. You can choose files in either the volume directory or one of the subdirectories—up to 51 files in any one of 11 directories. You can also edit the program so that on booting you can transfer preselected files to /RAM.

Transfer's main menu permits selection of the volume directory or others. Using the up- and down-arrow keys (which move a light-bar selector), choose the files you want to transfer and mark/unmark them with the right and left arrows.

If you choose the subdirectory option, the program displays up to 11 unlocked directory files listed in the volume directory. You can select any one of them and ask the program to display its unlocked files. Again, you can mark any file for transfer.

By adding the following three lines to Transfer and using a short start-up program (such as that in **Listing 6**), the program can automatically transfer preselected files to /RAM:

```
155 GOTO 410
565 GOTO 590
625 GOTO 640
```

Setting the prefix in the start-up program transfers unlocked files in any directory, not just files in the volume directory. For example, the start-up program in **Listing 6** transfers all unlocked files in the directory **UTILITY**, of the volume directory **MY.DISK**.

For readers with expanded RAM drives, be sure to run the driver program for your expansion card before you run Transfer. ■

Write to Harold D. Portnoy at 1431 Woodward, Bloomfield Hills, MI 48013.

80-Column Listing

by Vera Bagboudarian

To print a program in 80-column format, type **Listing 7** into a text file

Listing 5. Transfer.

```
10 REM ****
20 REM FILE TRANSFER PROGRAM
30 REM by
40 REM Harold D. Portnoy
50 REM ****
60 REM This program will transfer unlocked files in the volume
70 REM directory to /RAM. Any driver for expanding RAM should be
80 REM run before this program
90 REM
100 PRINT CHR$(4); "PR#3": HOME
110 GOSUB 1260
120 ONERR GOTO 1180
130 DIM LS$(50): DIM TS$(50): DIM CK(50)
140 DEF FN VERT(X) = X - INT(X / R1) * R1 + R2: DEF FN HRZ(Y) =
25 * INT(Y / R1) + C1: REM VERTICAL AND HORIZONTAL POSITION FOR
LIGHT BAR SELECTOR.
150 PRINT CHR$(4); "PREFIX ": INPUT V$: IF V$ = "/RAM/" THEN RM = 1:
GOTO 860: REM read prefix
160 REM main menu
170 HOME : VTAB 2: HTAB 29: PRINT "/RAM FILE TRANSFER"
180 PRINT : HTAB 28: PRINT "by Harold D. Portnoy"
190 VTAB 5: GOSUB 1110: VTAB 10: HTAB 25: PRINT "Volume prefix: "; V$ 
200 PRINT : VTAB 20: GOSUB 1110: GOSUB 1120: GOSUB 1130
210 LS$(0) = "Select Volume Directory": LS$(1) = "Select
Subdirectory": LS$(2) = "Quit": R1 = 3: R2 = 12: C1 = 28: N = 2: M1 = 1: M2 =
23: AR = 0: GOSUB 900
220 ON M + 1 GOTO 410, 240, 850
230 REM read unlocked directories from volume directory
240 HOME : VTAB 2: HTAB 25: PRINT "Processing Unlocked Directories":
HTAB 30: PRINT "Prefix: "; V$ : GOSUB 1110
250 PRINT : VTAB 20: GOSUB 1110: GOSUB 1120: GOSUB 1130: GOSUB 1140
260 PRINT CHR$(4); "OPEN"; V$; ", TDIR": REM look at volume directory
file
270 PRINT CHR$(4); "READ"; V$ : INPUT LS$: INPUT LS$: INPUT LS$
280 AR = 0: R1 = 4: R2 = 8: C1 = 3: M1 = 2: M2 = 15
290 FOR K = 0 TO 10
300 INPUT LS$(K): ON ( MID$(LS$(K), 18, 3) = "DIR") * ( LEFT$(LS$(K), 1) =
" ") GOTO 310: ON LS$(K) = "" GOTO 320: GOTO 300
310 VTAB FN VERT(K): POKE 36, FN HRZ(K): PRINT MID$(LS$(K), M1, M2); :
GOTO 330
320 N = K - 1: K = 10
330 NEXT
340 PRINT CHR$(4); "close"
350 IF N < 0 THEN VTAB 12: HTAB 29: PRINT "No unlocked directories
": PRINT : VTAB 20: GOSUB 1110: VTAB 21: PRINT CHR$(11): VTAB 22:
PRINT "To re-start: Press RETURN "; : GET A$: GOTO 150
360 GOSUB 900
370 IF A$ = CHR$(32) THEN 830
380 LS$ = LS$(M): GOSUB 1050
390 V$ = V$ + M$ + "/"
400 REM read unlocked files from subdirectory
410 HOME : VTAB 1: HTAB 28: PRINT "Processing Unlocked Files": HTAB
30: PRINT "PREFIX: "; V$ : GOSUB 1110: PRINT
420 PRINT : VTAB 21: GOSUB 1110: GOSUB 1120: GOSUB 1150
430 PRINT CHR$(4); "prefix"; V$ 
440 PRINT CHR$(4); "OPEN"; V$; ", TDIR"
450 PRINT CHR$(4); "READ"; V$ : INPUT LS$: INPUT LS$: INPUT LS$
460 AR = 1: R1 = 17: R2 = 4: C1 = 3: M1 = 1: M2 = 19
470 FOR K = 0 TO 50
480 INPUT LS$: TS$(K) = MID$(LS$, 18, 3): ON TS$(K) = "DIR" GOTO 480: ON
LEFT$(LS$, 1) = " " GOTO 490: ON LS$ = "" GOTO 530: GOTO 480: REM GET
UNLOCKED FILES
490 LS$(K) = MID$(LS$, 2, 19): L(K) = VAL ( MID$(LS$, 64, 8)): REM
obtain file name and length
500 VTAB FN VERT(K): POKE 36, FN HRZ(K): PRINT MID$(LS$(K), M1, M2); :
510 GOSUB 1050
520 LS$(K) = M$: GOTO 540
530 N = K - 1: K = 50
540 NEXT K
550 PRINT CHR$(4); "CLOSE"
560 IF N < 0 THEN HOME : VTAB 4: HTAB 30: PRINT "Prefix: "; V$ : VTAB
5: GOSUB 1110: VTAB 20: GOSUB 1110: VTAB 9: HTAB 33: PRINT "No
unlocked files.": PRINT : GOTO 830
570 GOSUB 900
580 REM next section transfers each file as a T-Type to a buffer at
$2000-$7000. Then transfers the file to the RAM disk. ProDOS MLI
CALLused to reset file information.
```

Listing continued.

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Listing continued.

```
590 PRINT : VTAB 1: HTAB 26: PRINT "Transferring Files to /RAM "
600 REM transferring files from disk to RAM disk
610 FOR I = 0 TO N
620 PRINT CHR$(4); "FRE": REM keep garbage from overwriting
transfer buffer
630 IF NOT CK(I) THEN 790
640 VTAB FN VERT(I): POKE 36, FN HRZ(I) - 1: PRINT CHR$(15); CHR$(27); "E"; CHR$(24); CHR$(14);
650 PRINT CHR$(4); "PREFIX"; V$  
660 L$ = L$(I): T$ = T$(I): L = L(I)
670 POKE 817,196: POKE 824,10: CALL 787,L$: REM GET_FILE_INFO
680 GOSUB 1230: REM ProDOS error
690 PRINT CHR$(4); "CREATE/RAM/"; L$; ",T"; T$  
700 FOR B = 0 TO L STEP 20480
710 LN = L * (L < 20480) + 20480 * (L > = 20480)
720 PRINT CHR$(4); "BLOAD"; V$; L$; ",A$2000,B"; B; ",L"; LN; ",T"; T$  
730 PRINT CHR$(4); "BSAVE/RAM/"; L$; ",A$2000,B"; B; ",L"; LN; ",T"; T$  
740 L = L - 20480
750 NEXT I
760 PRINT CHR$(4); "PREFIX /RAM"
770 POKE 817,195: POKE 824,7: CALL 787,L$: REM RE-SET_FILE_INFO TO
ORIGINAL SETTINGS
780 GOSUB 1230: REM ProDOS error
790 NEXT I
800 REM and finish
810 PRINT CHR$(4); "PREFIX /RAM"
820 HOME : PRINT : VTAB 3: HTAB 31: PRINT "File Transfer Complete":
HTAB 32: PRINT "Prefix: "; V$: PRINT : GOSUB 1110: VTAB 20: GOSUB 1110
830 L$(0) = "Select New Volume": L$(1) = "Select Present Prefix": L$(2)
= "Quit": R1 = 3: R2 = 12: C1 = 32: N = 2: M1 = 1: M2 = 23: AR = 0: GOSUB 900
840 ON M + 1 GOTO 860, 880
850 HOME : PRINT CHR$(17): END
860 HOME : VTAB 5: GOSUB 1110: VTAB 20: GOSUB 1110: ON RM GOSUB 1160:
VTAB 12: HTAB 25: PRINT "Insert new disc into Drive 1": VTAB 13: HTAB
25: PRINT "and press RETURN when ready. ";; GET A$: PRINT
870 PRINT CHR$(4); "PREFIX, D1": GOTO 150
880 PRINT CHR$(4); "PREFIX"; V$: GOTO 170
890 REM light bar selector
900 M = 0: GOTO 970
910 GET A$: IF A$ = CHR$(11) THEN M = (M - 1) * (M > 0) + N * (M =
0): GOTO 970
920 IF A$ = CHR$(10) THEN M = (M + 1) * (M < > N): GOTO 970
930 IF NOT AR THEN 960
940 IF A$ = CHR$(21) THEN CK$ = CHR$(15) + CHR$(27) + "D" +
CHR$(24) + CHR$(14): CK(M) = 1: GOTO 1000
950 IF A$ = CHR$(8) THEN CK$ = ":" CK(M) = 0: GOTO 1000
960 ON (A$ = CHR$(13)) + (A$ = CHR$(32)) GOTO 1020: GOTO 910
970 P = (M - 1) * (M > 0) + N * (M < 1): VTAB FN VERT(P): POKE 36, FN
HRZ(P): PRINT MID$(L$(P), M1, M2);
980 P = (M + 1) * (M < N) + N(M = N): VTAB FN VERT(P): POKE 36, FN
HRZ(P): PRINT MID$(L$(P), M1, M2);
990 VTAB FN VERT(M): POKE 36, FN HRZ(M): PRINT CHR$(15); MID$  
(L$(M), M1, M2); CHR$(14);: GOTO 910
1000 VTAB FN VERT(M): POKE 36, FN HRZ(M) - 1: PRINT CK$;: GOTO 990
1010 GOTO 910
1020 VTAB FN VERT(M): POKE 36, FN HRZ(M): PRINT MID$(L$(M), M1, M2);
1030 RETURN
1040 REM remove spaces from file name
1050 M$ = ""
1060 FOR J = 2 TO 16: A$ = MID$(L$, J, 1): IF A$ = " " THEN J = 16:
GOTO 1080
1070 M$ = M$ + A$  
1080 NEXT J
1090 RETURN
1100 REM messages
1110 FOR S = 1 TO 8: PRINT CHR$(15); CHR$(27); "SSSSSSSS"; CHR$(24);
CHR$(14);: NEXT : RETURN
1120 PRINT "To move: Press "; CHR$(15); CHR$(27); "J"; CHR$(14); "or ";
CHR$(15); "K"; CHR$(24); CHR$(14): RETURN
1130 PRINT "To select: Press RETURN": RETURN
1140 PRINT "To re-start: Press SPACE BAR": RETURN
1150 PRINT "To Mark/Unmark files: Press "; CHR$(15); CHR$(27); "U";
CHR$(14); "or "; CHR$(15); "H"; CHR$(24); CHR$(14): PRINT "To
accept marked files: Press RETURN": RETURN
1160 VTAB 10: HTAB 25: PRINT "Prefix /RAM/ not acceptable.": RM = 0:
RETURN
1170 REM error
1180 E = PEEK (222): CALL - 3288: ON (E = 9) GOTO 1210: ON (E = 5)
```

Listing continued.

Listing continued.

```

GOTO 320
1190 IF E = 19 THEN 780
1200 HOME : VTAB 5: GOSUB 1110: VTAB 20: GOSUB 1110: VTAB 12: HTAB
30: PRINT "Unanticipated error #"; PEEK (222); CHR$ (7): END
1210 HOME : VTAB 5: GOSUB 1110: VTAB 20: GOSUB 1110: VTAB 12: HTAB
35: PRINT "RAM disk full"; CHR$ (7)
1220 PRINT CHR$ (4); "DELETE /RAM/"; LS: END
1230 IF PEEK (768) > 0 THEN HOME : VTAB 5: GOSUB 1110: VTAB 20:
GOSUB 1110: VTAB 12: HTAB 26: PRINT "Unanticipated ProDOS MLI error
#"; PEEK (768); CHR$ (7): END
1240 RETURN
1250 REM POKEs FOR FILEINFO SUBROUTINE AT ADDRESS: 787-826. 40 BYTES
1260 FOR N = 0 TO 39: READ P: POKE 787 + N, P: NEXT
1270 DATA
32,190,222,32,227,223,133,171,132,172,169,2,160,3,133,113,132,114,32,21
2,229,56,233,2,141,1,3,32,0,191,196,56,3,141,0,3,96,10,1,3
1280 RETURN

```

End of listing.

Listing 6. Sample start-up program.

```

10 PRINT CHR$ (4); "-RAM DRIVER PROGRAM"
20 PRINT CHR$ (4); "PREFIX MY.DISK/UTILITY"
30 PRINT CHR$ (4); "-TRANSFER.ALL"

```

Listing 7. List 80.

```

1 ? CHR$(4)"PR#1"
2 ? CHR$(9)"80N";
3 ? CHR$(9)"60P"
4 LIST 10-
5 ? CHR$(4)"PR#0"
6 END
RUN
1
2
3
4
5
6
END

```

with a text editor or word processor (DOS-based). Then load a BASIC program, turn on your printer, and type EXEC LIST80. List 80 activates the printer, then lists your BASIC program in memory in 80 columns (line 2), 60 lines per page (line 3). In addition, you can change these two lines to produce any other format you prefer. ■

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• COUNT WORD	• 1 WORK
• 10 A	• 1 WRITING
• 1 ADDRESS	• 9 YOU
• 1 ADDRESSES	• 1 YOU'VE
• 6 ALMOST	• 8 YOUR
• 1 ALMOST	• TOTAL WORDS: 402
• 1 ALWAYS	• CHARACTERS: 2013
	• CHARS/WORD: 5.0

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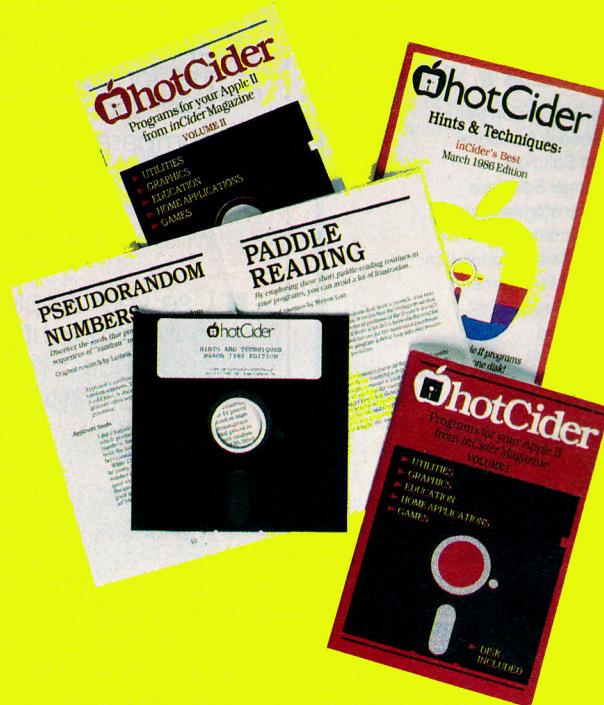
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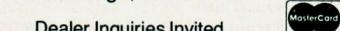


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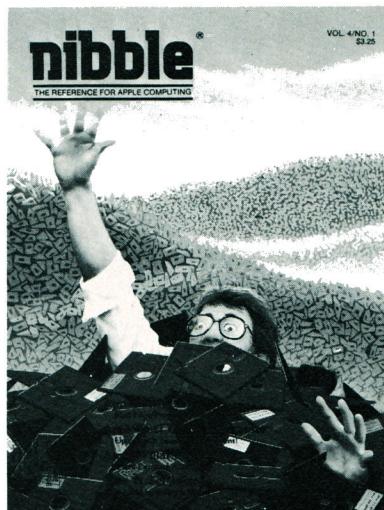
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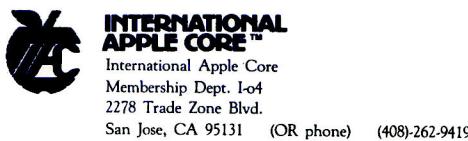
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EDITORS' CHOICE

MacroWorks: The Icing on AppleWorks' Cake

Not every //e or //c owner needs AppleWorks, but every AppleWorks user can benefit from **MacroWorks**. Randy Brandt's enhancement package is a combined wish list and toolbox for Apple's spectacularly popular integrated program. It adds to AppleWorks what other utilities add to DOS 3.3 or ProDOS—extra speed and functions that soon become invaluable.

Macros, made famous by IBM PC programs like Lotus 1-2-3 and SuperKey, are keystrokes stored for playback when you type an abbreviation. MacroWorks, for example, lets you assign the sequence "Very truly yours," five carriage returns, and your name to solid apple-V (its solid-apple commands coexist with AppleWorks' own open-apple syntax).

Typing frequently used text is one thing, but typing AppleWorks commands is MacroWorks' specialty. Its macros add a keyboardful of changeable commands—not really new ones, in that they merely quickstep through AppleWorks menus or functions for you, but conveniences that left the *inCider* staff gleeful and grinning. Want to delete a character forward as well as backward, cut a word or line (and get it back if you change your mind), print a document, or flip between desktop files with a keystroke? Piece of cake.

While these and other default macros are primarily for word processing, making macros for other purposes (such as setting a range of spreadsheet column widths) is as easy as editing a word-processing file. And since it's installed on your AppleWorks start-up disk, MacroWorks takes almost no additional memory or boot time.



Technical Editor Paul Statt says, "MacroWorks takes a simple idea to extremes—if you find yourself typing the same keystrokes constantly, MacroWorks types them for you. Furthermore, it types so quickly you can accomplish tasks you would never attempt yourself, like putting all the words you delete into the clipboard so that you can get them back."

"The Beagle Bros always toss something special in the sack when you buy their products, and the lagniappe in MacroWorks has three parts: a newsletter aid that prints AppleWorks word-processor files in two or three columns, a cataloguer that prints a sorted list of disk files, and a file analyzer.

"I'd pay 35 bucks just for the file analyzer—it makes a sorted list of every word in a word-processor file and calculates the number of words, average length, and the number of times you used each one. It's perfect for editors, and it's a guard against monotony or obtuse style."

"It won't work with Pinpoint, Jeeves, or early (pre-4.3) versions of

Applied Engineering or Checkmate RAM cards' desktop expanders, but otherwise can't say enough about MacroWorks—everything you read in the ads is true. If you use AppleWorks, buy it."

According to Review Editor Eric Grevstad, "Micro users become macro addicts for two reasons. MacroWorks automates data entry, typing your return address or whatever, well enough, but its shorthand command entry is sensational. Even if you never write a macro of your own, its word-processing commands make AppleWorks a much better program—terrifically fast, with invaluable commands Apple forgot (well, didn't forget, but made too laborious for casual use).

"I spent my first day at *inCider* admiring AppleWorks' file handling, but snarling, 'Four keystrokes to delete a word?' Now, with MacroWorks' delete, undelete, desktop-switch, and cursor-movement commands, I hardly miss my 256K MS-DOS word processor. Forget Editors' Choice; this could be Product of the Year."

MacroWorks requires a //e or //c with 128K, ProDOS, and AppleWorks. It costs \$34.95 (not copy-protected) from Beagle Bros, 3990 Old Town Avenue, San Diego, CA 92110, (619) 296-6400.

*Every month, hardware and software manufacturers release dozens of new products into the Apple II market. Editors' Choice singles out one product each month that the *inCider* editors feel is a significant addition to the Apple II family of products. Products evaluated in Editors' Choice are among the most recent releases and may not be available yet for retail distribution.*

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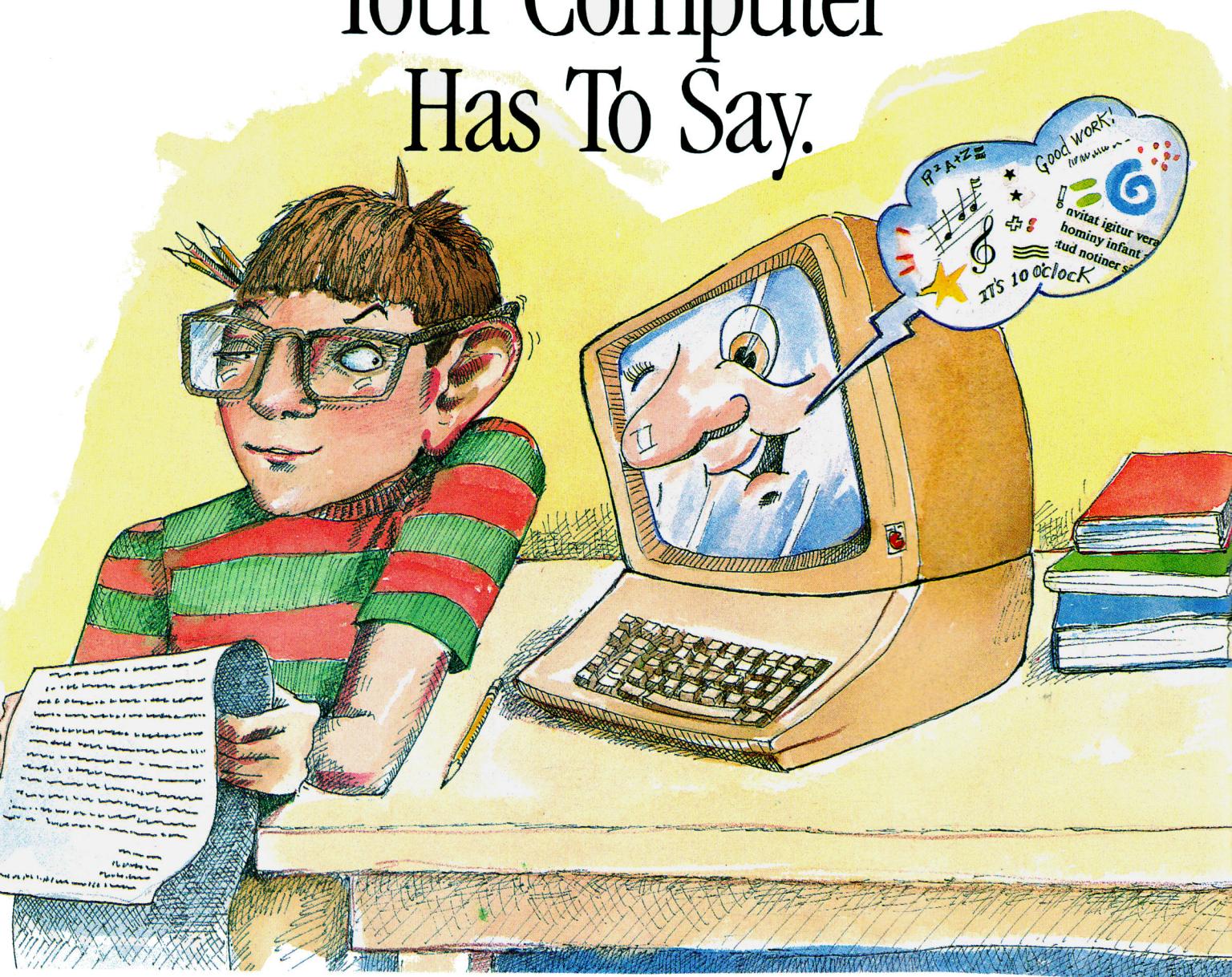
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