THE APPLE II MAGAZINE

inCider

A+/A2 PUBLICATION

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Pg. 91

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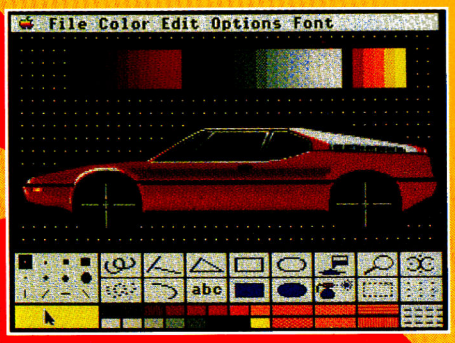

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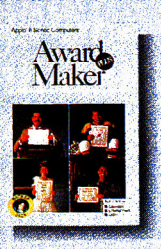

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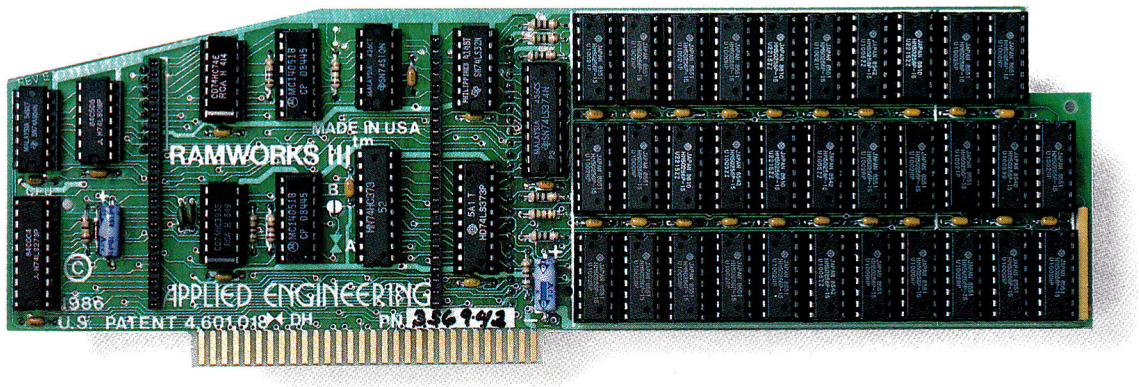


With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

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

The AppleWorks Amplifier.

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

Only RamWorks eliminates AppleWorks' internal memory limits, increasing the maximum number of records available from 1,350 to over 25,000. *Only* RamWorks increases the number of lines permitted in the word processing mode from 2,250 to over 15,000. And *only* RamWorks offers a built-in printer buffer, so you won't have to wait for your printer to stop before returning to AppleWorks. RamWorks even expands the clipboard. And auto segments large files so they can be saved on two or more disks. You can even have Pinpoint or MacroWorks and your favorite spelling checker in RAM for instant response.

RamWorks, nothing comes close to enhancing AppleWorks so much.

The Most Friendly, Most Compatible Card Available.

Using RamWorks III couldn't be easier because it's compatible with more off-the-shelf software than any other RAM card. Popular programs like AppleWorks, Pinpoint, Catalyst, MouseDesk, Howard-Soft, FlashCalc, Pro-Filer, Managing Your Money, SuperCalc 3a, and MagiCalc to name a few (and *all* hardware add on's like ProFile and Sider hard disks). RamWorks is even compatible with software written for Apple cards. But unlike other cards, RamWorks plugs into the IIe auxiliary slot providing our super sharp 80 column text (U.S. Patent #4601018) in a completely integrated system while leaving expansion slots 1 through 7 available for other peripheral cards.

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

Highest Memory Expansion.

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

It Even Corrects Mistakes.

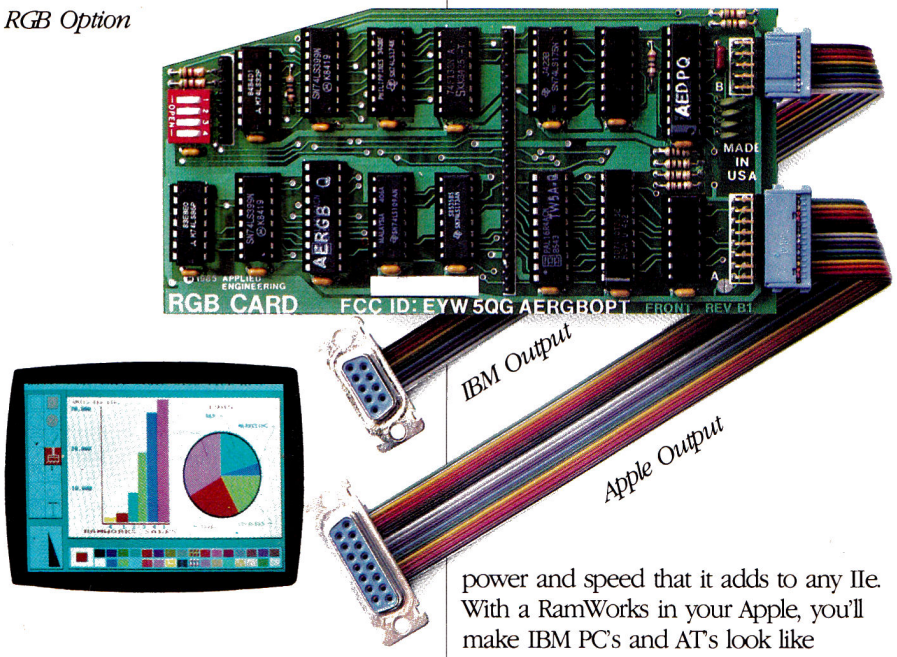
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

The Ultimate in RGB Color.

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

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

RGB Option



True 65C816 16 Bit Power.

RamWorks III 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.

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 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 is king of the hill."



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

Steve Wozniak, the creator of Apple Computer

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

Quality and Support of the Industry Leader

RamWorks III is from Applied Engineering, the largest, most well supported manufacturer of Apple peripherals and the inventor of large RAM cards for the Apple. With our 5 year no hassle warranty and outstanding technical support, you're assured of the most trouble free product you can buy.

It's Got It All

- 15 day money back guarantee
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- Built-in super sharp 80 column display, (U.S. Patent #4601018)
- Expandable to 1 MEG on main card
- Expandable to 16 meg with expander cards, with NO slot 1 interference
- Can use 64K or 256K RAMs
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- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
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- Compatible, RGB option featuring ultra high resolution color graphics and multiple text colors, with cables for both Apple and IBM type monitors
- Built-in self diagnostics software
- Lowest power consumption (U.S. Patent #4601018)
- Takes only one slot (auxiliary) even when fully expanded
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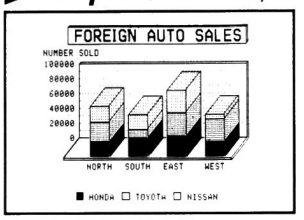

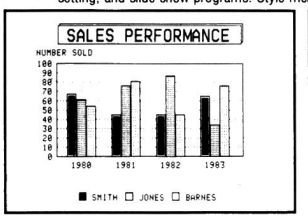

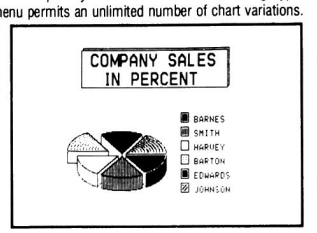

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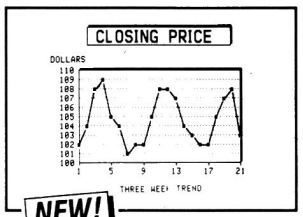

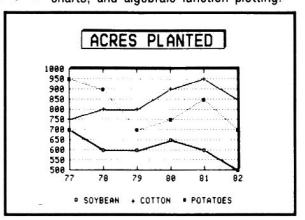

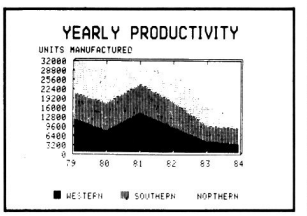

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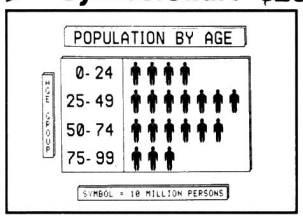

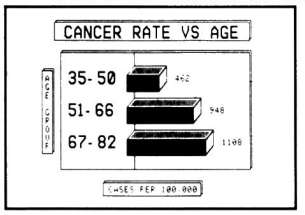

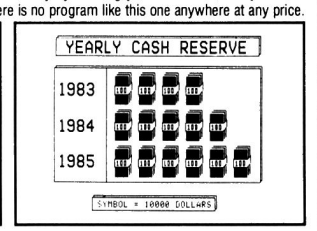

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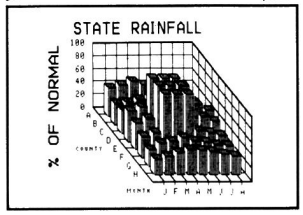

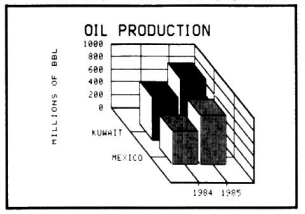

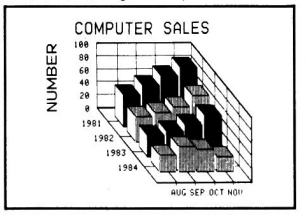

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Advertising

Eastern Sales Representative Dale Strang (800) 441-4403
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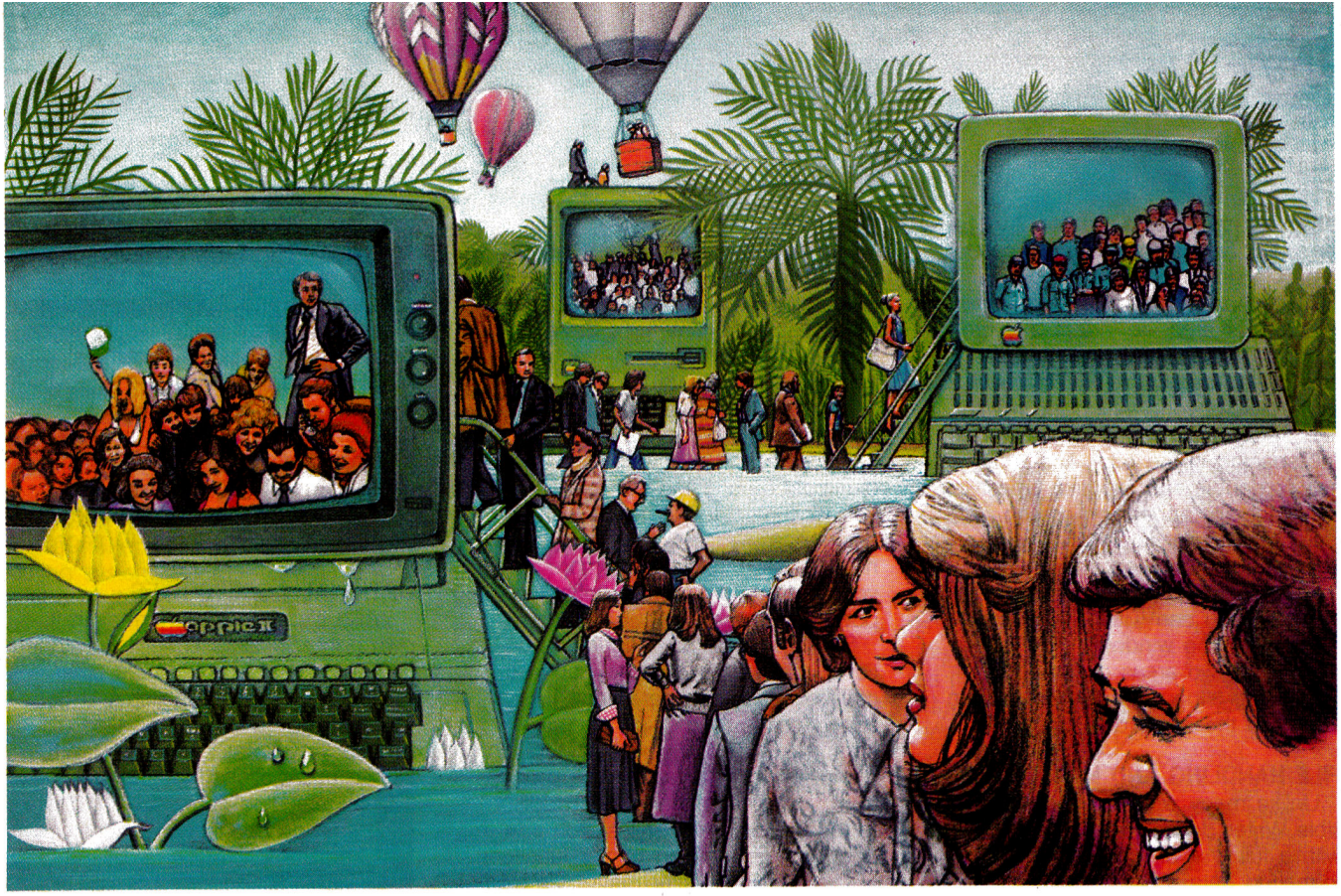

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inCider

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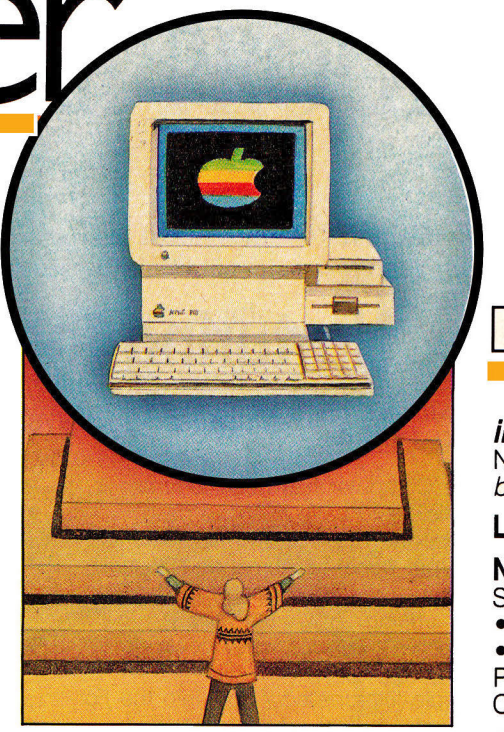

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Nurturing the Cash Cow

by Deborah de Peyster, Editor in Chief



"Apple's new software company must recognize the value of AppleWorks and the needs of its users."

Apple Computer has been fortunate in its history to have had two cash cows—the Apple II and AppleWorks, products that generate tremendous quantities of money while appearing to demand very little tending. That's the fallacy: Although it isn't obvious, cash cows do need nurturing.

The Apple II propelled Apple into the Fortune 500 and helped create more than $500 million in cash reserves, while its support in the company declined. AppleWorks generates roughly $20 million a year (based on sales of 500,000 copies since 1984) and has yet to show a decline in sales, but Apple has assigned fewer than a handful of part-time people to manage it. By contrast, Aldus' Pagemaker, a successful desktop-publishing program for the Mac and IBM, has 15 full-time people in technical support and about 200 people in the rest of the company.

Success despite lack of support makes the cash cow seem invincible. This stance breeds complacency: a kind of don't-fix-it-if-it-still-works attitude that keeps the manufacturer from investing in new directions or greener pastures. Upgrading the II to 16-bit technology took Apple an inordinate amount of time, and the company still hasn't developed or acquired a 16-bit, menu-driven version of AppleWorks.

As the cash cow continues to produce, the firm's sense of urgency to re-invest diminishes further. More and more, the product becomes a source of money for other investments, and receives very little return on its own dollar. While Apple II owners waited for newer, faster Apple IIs, Apple routed its revenues into other projects. The Macintosh line lived on the earnings of the Apple II until last year, when the Mac finally caught on and generated its own revenue.

Now Apple has announced formation of a new software company to develop, publish, and market applications for the Macintosh and Apple II families. Attention focuses immediately on AppleWorks. We've heard industry observers say they expect AppleWorks to account for as much as 80 percent of the new firm's sales revenue.

Aha, you say, now this lonely cash cow will finally get the support and attention it deserves and needs. Now it'll have more than a handful of part-time people guiding its future. It'll finally have its own technical-support hot line for customers, its own team of technical experts working to improve and enhance it, and its own marketing and advertising campaigns to support its growth.

History, however, has shown us just the opposite. Cash cows are milked for all they're worth. But make no mistake: They don't live forever. Putting off investment in the cash cow too long places the product's continued success in jeopardy. The Apple II almost reached that point last year, before the IIGS was introduced. The inexpensive power of MS-DOS clones began to lure even the most dedicated Apple IIe user.

We hope Apple's new software company won't make the same mistake with AppleWorks—neglecting its need for support and investment in favor of launching new Macintosh products. Don't get us wrong: We hope AppleWorks will be the cornerstone of the new company and that its earning power will lead to new-product development in all areas. But we also hope Apple will make those investment decisions only after careful assessment of AppleWorks' needs.

To remain vital, AppleWorks needs a dedicated technical-support group, efficient customer service, and investment in new technology and marketing. Let's see a 16-bit AppleWorks and new versions that include graphics and communications. How about an AppleWorks that includes macro capability, or one that adds desktop publishing to the word processor?

AppleWorks has a lot to offer, and it has a dedicated audience of users. It continues to surprise the company with its popularity: During the recent upgrade program, Apple received more than 20,000 requests for 2.0. That number surpassed all expectations and the results of all other previous Apple upgrade programs, according to an AppleWorks spokesperson.

We urge Apple's new software company to recognize the value of AppleWorks and the needs of its users. Now is the time to invest in the cash cow, not milk it dry.■

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LETTERS

With All the "Works"

I agree with Paul Statt's contention (Stattus Report, April 1987, p. 18) that "the success of AppleWorks has more to do with its unique all-in-one applicability than its raw computing power." The basis for most of his criticisms, however, seems unfair and unjustified.

AppleWorks is a powerful integrated application, not integrated powerful applications. (I hope the distinction isn't lost.) Although Mr. Statt is unhappy with AppleWorks' degree of integration, consider the PFS series or Magic Office System. In my opinion, the AppleWorks clipboard works quite smoothly.

Mr. Statt says, "Today's AppleWorks is a mess—of fixes, gerryrigging, and complications." While all the "-Works" products available certainly enhance AppleWorks, you hardly need them. Personally, I like the way Apple leaves the door open to third-party developers. Look at the IBM world of WordStar and dBase: no add-ons or "gerryrigging," and no choices, no imagination, no fun.

Mr. Statt also notes that AppleWorks users are "driving to the poorhouse" because of that program's lack of power. You can order AppleWorks 2.0 with RAM and macro enhancements, desk accessories, and Visualizer IIGS for $405. Mr. Statt likes power: VIP Professional, Omnis 3, and Apple Writer (without macros or RAM enhancement) cost $793. And pity the poor IBM user: dBase III, Lotus 1-2-3, and WordStar 2000 add up to $1107. Power is expensive.

Criticizing AppleWorks seems to be popular these days, and certainly there are legitimate complaints, but please be fair about it.

Matt Cole
12194 Applewood Knolls Drive
Lakewood, CO 80215

I agree wholeheartedly with Paul Statt's assessment of the AppleWorks file-card interface (Stattus Report, April 1987, p. 18). It's always a relief to return to AppleWorks after mousing around with the Macintosh-style interface Apple now insists on using.

I don't agree, though, that AppleWorks needs all those other "-Works" just to work. AppleWorks has impressive power and flexibility without them, considering how easy it is to learn to use. If AppleWorks came with all those additions you mentioned, it would also come with a big fat manual, several more disks, and a high price. I appreciate being able to choose only the options I want. I'm now down to one, after getting rid of several I thought might be useful.

Third-party developers have had a lot of fun cooking up goodies for AppleWorks, but buyers should be aware that a lot of those add-ons are as useful as putting whitewalls on the family station wagon. AppleWorks can provide many of those goodies at no extra cost.

For example, the office where I work uses the AppleWorks database to write checks. While it may not have all the bells and whistles of a program like Quicken, it does everything our office needs without having to load a separate program. An empty corner of a spreadsheet kept on the desktop makes a powerful pop-up calculator. You can even make your own AppleWorks telephone dialer (see *Open-Apple*, April 1987, p. 3.18). I can think of dozens of "add-ons" that should more appropriately be called "replacements."

Many people do want features that are unavailable in AppleWorks, but not everyone wants or needs the same ones. If AppleWorks included everything anyone might want, it would become an unwieldy program such as the one my friend struggles with on his IBM PC. AppleWorks is so easy to personalize. Maybe that's why half a million people use it.

C. Roberts
35 Brookdale Court
Lafayette, CA 94549

Memorable Date

I enjoyed Jonathan T. McPhee's ingenious article ("Enhancing Apple Writer," April 1987, p. 47) on time- and date-stamping and using a RAM disk with Apple Writer II. Unfortunately, the IIc System Utilities disk (unlike the ProDOS User's Disk Mr. McPhee uses) doesn't let you POKE the time and date into memory. However, IIc users can adapt Mr. McPhee's basic method to date-stamp Apple Writer files with certain other programs.

Footwriter, from RKB Software (1149 South 1100 East, Salt Lake City, UT 84105), is a disk of Apple Writer II enhancements that involve primarily footnotes. It also includes a calendar preboot for ProDOS Apple Writer.

Several ProDOS applications, such as AppleWorks and Copy II Plus, prompt you to enter the date when you first boot up. If you use one of these applications and insert the date at the beginning of the day, the date stays in memory as long as you move from one ProDOS program to another without rebooting.

For example, from the Copy II Plus main menu, select Quit and enter Q to quit to ProDOS. When ProDOS asks for a prefix, enter /AW2MASTER/. When it asks for a pathname, enter AW.SYSTEM. If you're in BASIC you don't need to exit to ProDOS. As Mr. McPhee describes: You can run Apple Writer from BASIC with the BASIC dash (–) command. To exit Apple Writer without rebooting, press Control-Q to go to the Additional Functions menu and type J. Unless you reboot, it's possible to move about freely in ProDOS without disturbing the date in memory.

Kenneth A. Krantz
4523 Pickett Road
Fairfax, VA 22032

All-Points Bulletin

My parents are planning to buy me a modem. I'd like to know if there's a log-on fee for using *inCider*'s BBS (bulletin-board system). I plan to use it often for information on various topics.

Christopher Cayetano
1109 Raposa Drive
San Jose, CA 95121

There's no log-on fee for using inCider's BBS. For anyone calling from beyond the local area, however, a long-distance charge is involved.

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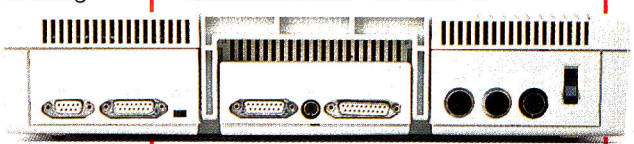



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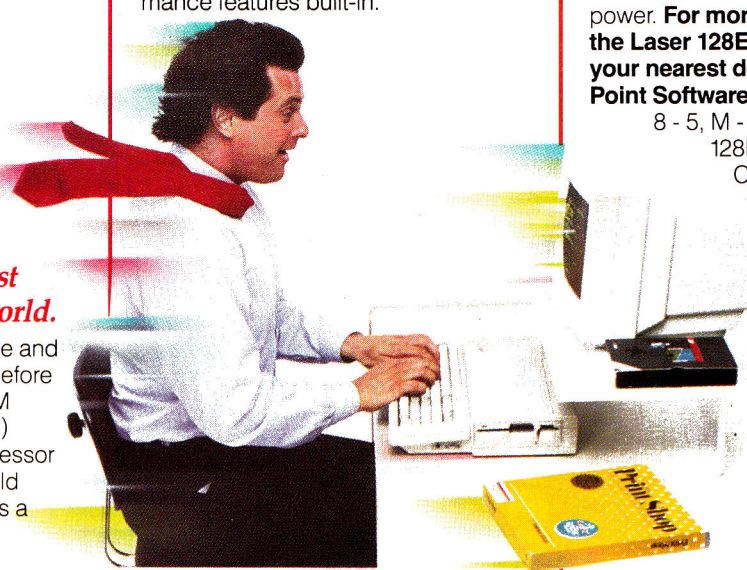

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—eds.

File This

I'm looking for a good database program. I have an Apple IIGS computer with 512K of RAM and 3½- and 5¼-inch drives. Any suggestions?

Robert A. Wyatt
P.O. Box 388
Berryville, VA 22611

You might be interested in Softwood GS File, $149.95 from Softwood Company (P.O. Box 90331, Santa Barbara, CA 93190-0331, 805-966-4662). It allows up to 32 fields per record, includes macro capability, and converts AppleWorks database files to SoftWood format.

—eds.

Driving Nowhere

About a year ago, I bought two Apple UniDisk 3.5 drives (model A2M 2053) for my Apple IIc, and I'm very pleased with them.

Now I want to upgrade my system to a IIGS, and I assumed these drives were compatible. To my surprise, I was informed I'd have to use the newer platinum drives with the IIGS and that earlier-model UniDisks work only with the IIc and IIe. I was also told it might be possible to use the old drives in a IIGS with a controller card instead of the built-in port, but this might create problems.

Surely, there must be a simpler solution. The older drives look identical to the new ones and the cables are the same. If they're incompatible, can you upgrade the older drives to work with the newer hardware?

Willis G. McMillan, M.D.
3602 Blackhawk Drive
Madison, WI 53705

We've had mixed results with a single UniDisk 3.5 on our Apple IIGS. It usually works. But sometimes—not all the time—we get a "disk full" message when trying to save a file to a disk that's only half empty.

We tried two *UniDisk 3.5 drives on our IIGS with disastrous results. When we tried to save a file on the second one, everything stopped: We couldn't even eject the disk.*

The UniDisk 3.5 has its own built-in processor; the Apple 3.5 drive uses the IIGS SmartPort firmware and lacks a processor. That may explain the problem.

The official word is that the UniDisk is "compatible" with the IIGS. Whatever that means, we can't recommend it.

—eds.

Cauze 'n' Effect

I'm disappointed. I bought one of the Cauzin Systems Strip Readers because *inCider* announced it would print programs in data-strip form. The reader works fine, but yesterday your May issue arrived—without data strips.

Warren Mild
1001 Wentz Road
Blue Bell, PA 19422

We regret having to omit the Cauzin strips from the May and June issues because of limited space. Individuals wanting copies of strips we've been unable to publish should write or call inCider's *editorial offices (603-924-9471) so that we can forward them to you.*

—eds.

Racing Along

Having done a fair amount of work with Applesoft and the Apple II version of ZBASIC, I was surprised at the poor speed rating your reviewer gave ZBASIC ("Compiled BASICs Compared," May 1987, p. 92). In my own string-intensive ZBASIC programs, I've found a far greater speed improvement over Applesoft than the 24:10 ratio Mr. Ryan reports.

I decided to run a little comparison of my own. Because my test used one of ZBASIC's built-in string-handling functions, it gave a considerable advantage to this language, better than 58:1 over Applesoft.

Anyone considering purchasing a BASIC compiler should remember that ZBASIC is a greatly extended version of BASIC, and includes many high-speed single-command functions. Duplicating them in a simpler BASIC

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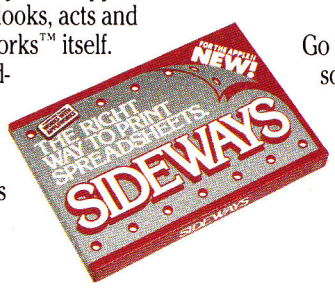

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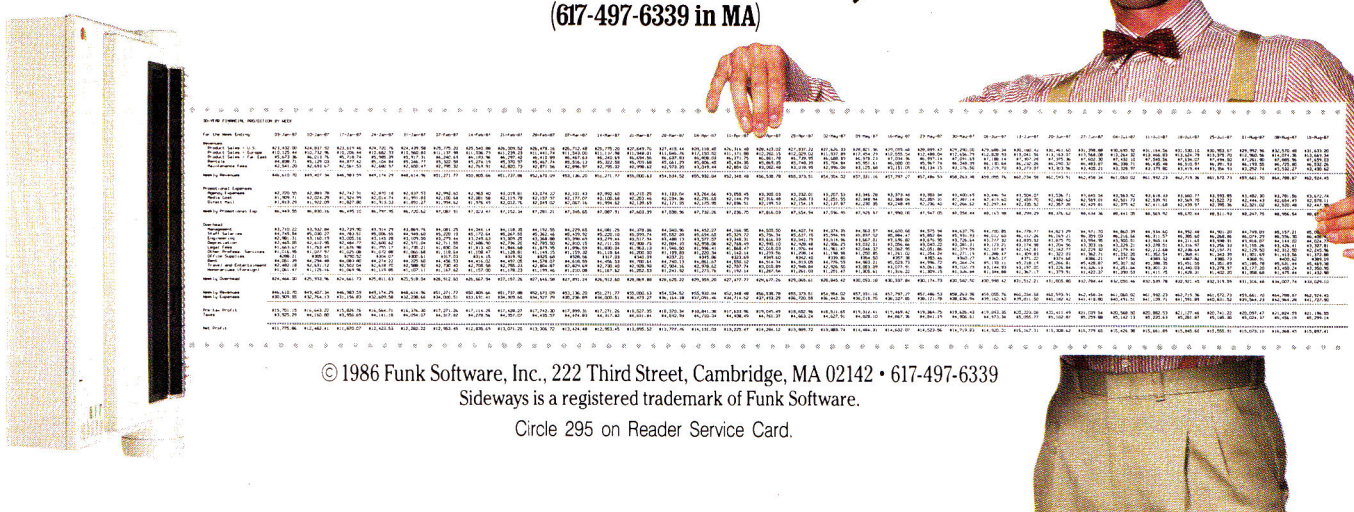

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LETTERS

requires much longer, more slowly running code.

Karl Bunker
321 South Huntington Avenue
Boston, MA 02130

BASIC Complaints

After reading the review of Micol BASIC ("Compiled BASICs Compared," May 1987, p. 92), I was incensed. The article seemed biased in favor of the Beagle Compiler over ZBASIC and our company's system, Micol BASIC.

Micol BASIC is a complete language system based on Applesoft BASIC. As mentioned in the article, the Beagle Compiler's only significant function is to speed up Applesoft programs. It's a code accelerator, not a real language system. Why were Beagle and Micol compared in the same article?

It's obvious from the first sentence of the review [which describes Applesoft as an interpreted language that translates program code into machine code one line at a time] that the reviewer didn't read the Micol manual in detail. This statement is false; the Micol manual states (p. 3) that no code, or only a tokenized version of the program to be executed, is generated by the interpreter.

The reviewer says, "Micol BASIC provides an editor, but I didn't like it," but also states, "While I have no love for Applesoft's editing capabilities, for most programmers it's a familiar environment in which to work." These statements imply that the author prefers the Beagle Compiler noneditor to the Micol editor, despite Micol's global search and replace, one-letter or full-word commands, and other features.

The most disgusting part of the article was the benchmark comparison. Because Micol BASIC generates true, directly executable machine code, while the Beagle Compiler generates a pseudocode that must be interpreted at runtime, one would expect Micol programs to execute faster in most instances.

While the reviewer didn't list his benchmark programs, I believe the explanation for his reversed results is that the Beagle Compiler, as I understand it, uses integers wherever it can to maximize speed. Micol BASIC, being a good structured language, lets the user choose his or her own data structures. Am I correct in saying that your reviewer benchmarked

the Beagle Compiler using integers against Micol BASIC using floating-point real numbers? If true, this is dishonest or incompetent.

While the author mentioned structured-loop control and routines with local variables, why didn't he add some of Micol BASIC's other advantages over Applesoft (and, by implication, over the Beagle Compiler), such as PRINT USING, a string-search command, much clearer file commands, GOSUBs to names rather than line numbers, or any of several others?

Apple II journals in Britain and West Germany have reviewed Micol BASIC far more extensively and objectively. I urge readers to write for these reviews and make an objective decision.

Stephen Brunier
President
Micol Systems
9 Lynch Road
Willowdale, Ontario M2J 2V6
Canada

Review Editor Eric Grevstad replies: The three products were compared for their compiled speed and compatibility with Applesoft; Bob Ryan's review clearly explained their appeal to different users and Micol BASIC's status as "a more complete language" that "gives Applesoft many advanced features." We stand by the review's description of the Applesoft interpreter and the objectivity of its benchmark tests. Also, saying that the Applesoft environment is familiar doesn't preclude one from saying that Micol's editor is imperfect.

---

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.*

CORRECTION

In July's Apple Clinic, under "End of 80N" (p. 24), the first line of the solution (BLOAD) should read

BLOAD APLWORKS.SYSTEM, TSYS,A$2000

instead of TTSYS.

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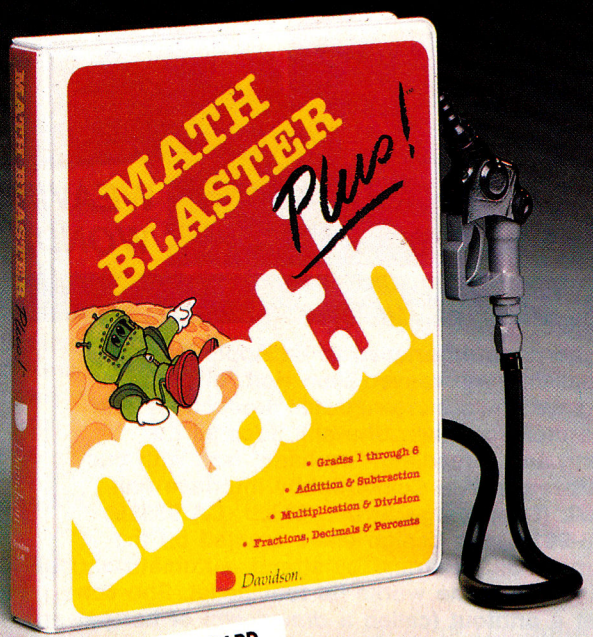

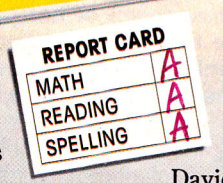

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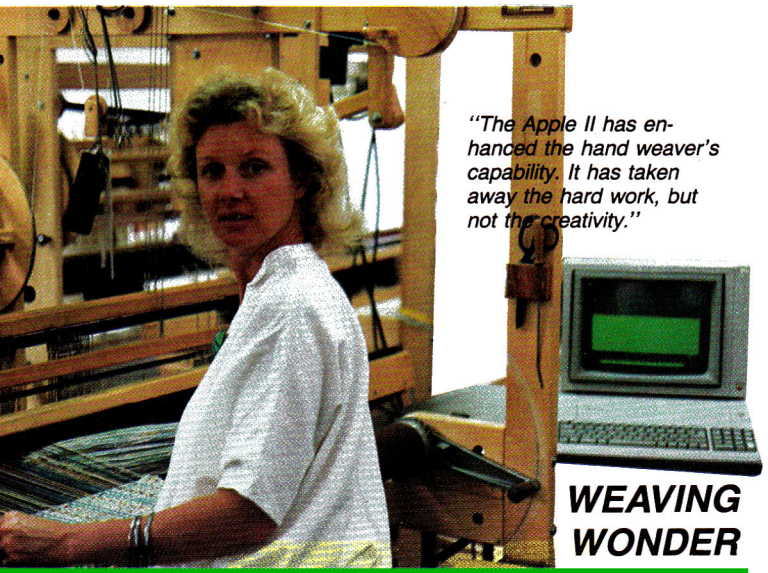
NEWS LINE



"The Apple II has enhanced the hand weaver's capability. It has taken away the hard work, but not the creativity."

WEAVING WONDER

SPOTLIGHT ON....

With her loom interfaced to an Apple IIe, upholstery and drapery weaver Ellen Holt, of Dallas, Texas, says she's increased her productivity and become more creative. She still does all the threading and "treadling" by hand, but, with custom software and a CompuDobby interface unit from AVL (601 Orange Street, Chico, CA 95928, 800-626-9615), the design she's created on the Apple materializes strand by strand, automatically, on her loom as she works its foot pedal. She can also get a printout (called a *drawdown*) of her pattern in an instant. With her IIe hooked up to her loom, the system offers "unlimited possibilities [for] very sophisticated designs because they're so easy to change."

THE GS: NOW SELLING

Walk into an Apple dealership and look at a Macintosh, and a salesperson will come up to you and talk about desktop publishing. Look at a IIGS, and the salesperson will mention piano lessons.

Apple Computer is beginning to push sales of the GS, whose debut last fall was dampened by production delays. "We basically came out with a bang in September and haven't been able to do anything until now," says Tom Virden, IIGS Product Manager. "Now that machines are more available—there are still some people waiting, but you can find a GS if you want to—we're starting up again."

In late April, Virden claimed GS sales, primarily to Apple II enthusiasts and schools, totaled roughly 100,000 units, and Apple was preparing to begin pushing the new machine.

Virden described plans for increased advertising and local events, such as dealer open houses in the New York area, but says Apple's main emphasis will be on "bringing our salespeople up to date" on software availability. "We've been talking about graphics and sound, and now I'd like to back it up with the good pieces of software out there.

"When you think of the Apple IIc," Virden says, "you think of The Print Shop. Think of the Mac, you think of Excel and PageMaker." So what happens when you think of the GS? "We're excited about music, specifically music education," he notes. "It's perfect for the machine because of its sound capabilities, and it fits with Apple's educational position."

Besides music, Apple wants to do "more with the idea of home publishing," according to Virden—moving from The Newsroom and Certificate Maker to a place just below the Mac's much-touted desktop-publishing role. "With every Apple IIe bought, we figure there's a piece of home-publishing software being sold with it. People love that they can print cards, posters, banners; we're going to do more to get people aware of what they can do with home publishing, and what that adds to your home and school."

As far as promoting the GS for traditional productivity tasks, Apple is waiting for a particular program to come along. "Most [productivity products] that are shipping now for the GS, I think, need to be updated a bit. They need a few more features," Virden says. "I think the product we're really looking for is the mouse-based AppleWorks for the GS. We're not going to do it, and a number of companies have heard that and are working very hard on it. People are so used to the database, word-processing, and spreadsheet combination of AppleWorks that once they see a program that does that on the GS, but uses the extra color and graphics, it's going to be a runaway hit." **—E.G.**



THE BEAGLE TOUCH

"I'd like to merge MacroWorks and AutoWorks into a single package," says Mark Simonsen, who, as sole owner of Beagle Bros and The Software Touch, of San Diego, California, will be able to do just that.

"The merger of The Software Touch and Beagle Bros is something I've been considering for a year and a half," claims the former Beagle employee and former part owner of The Software Touch.

Simonsen bought the share Alan Bird, another Beagle alumnus, held in The Software Touch, and the entire Beagle Bros business from Sharon and Bert Kersey. According to Simonsen, Bird will remain at Beagle Bros/The Software Touch, where he'll "play a very key role," while the Kerseys are retiring from the software business.

Bird, author of AutoWorks, and Randy Brandt, creator of MacroWorks, want the new Beagle Bros to keep both program titles

in the combined catalogue: Simonsen promises that the new company will continue to pay authors on a royalty basis.

Bird and Brandt wrote most of the eight programs that comprise the first new Beagle Bros product. Tentatively titled TimeOut, it's a series of AppleWorks-accessory programs that don't require separate disks, as Pinpoint's modules do: TimeOut modifies AppleWorks itself.

Simonsen says the TimeOut series may eventually include as many as 32 programs; the first eight are a graphing function, an outliner, a file mover, a spelling checker, special fonts, sideways printing, a calendar, and Brandt's long-awaited Variety Page, which combines Print Shop pictures with AppleWorks documents. Prices range from $49.95–$99.95.

Beagle Bros and The Software Touch are two of the more innovative, exciting companies specializing in Apple II software—and they may now form the single most interesting firm in that market. **—P.S.**

PUBLISH OR PERISH

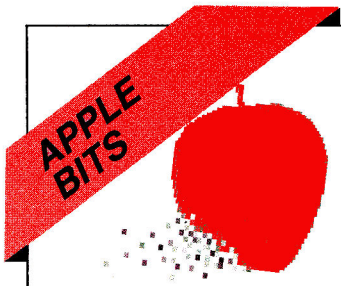
The Print Shop, Newsroom, and Certificate Maker are still going strong, but the battle for your creative-publishing dollar is heating up. At June's Consumer Electronics Show (CES) in Chicago, Springboard Software stood firm in the face of loud demand for its slick Springboard Publisher. It refused to name a shipping date other than "later in '87" (early fall?), but insisted it will sell no desktop-publishing program before its time.

Springboard's stance is awkward, since it created the demand by announcing Publisher last January for April release at $139.95. (A gullible editor put that tale into April's News Line, p. 16.) The company's image and stock price have suffered from the delay.

Springboard isn't the only hopeful in the 128K desktop-publishing game. At CES, Timeworks exhibited Desktop Publisher, a rival 8-bit package targeted for October sale at an unspecified price; it promises a similar mix of drawing tools, imported graphics, and word processing. (The program should accept ASCII or AppleWorks documents.) Some hinted-at font-handling features sound nice, but Timeworks showed only sample screens instead of a working demo.

Elsewhere at the show, a Unison World spokeswoman said her firm's engineers were stymied by the problems of squeezing the company's MS-DOS NewsMaster onto a 128K Apple. Unison's current hopes for the Apple focus on PrintMaster Plus ($49.95), a redesigned, enhanced version of a printing program that lost a copyright lawsuit to Broderbund's Print Shop.

Unison will see competition from game maker Epyx, which recently tried the print biz with clip-art disks and its Create a Calendar program. At CES, it dived in with Print Magic ($59.95). Due this fall, it looks like a nice all-around alternative to card, poster,



■Pecan Software Systems (Brooklyn, NY) is rounding out its line of development tools with **Fortran-77**, an enhanced version of the powerful language that joins Pecan's UCSD Pascal, Modula-2, and BASIC compilers in the company's Power System series.

■**Electronic Arts** has signed an exclusive distribution agreement with **Datasoft**. According to this agreement, Electronic Arts will distribute all Datasoft software sold in the United States and Canada (exclusive of Tandy Corporation, which will distribute Datasoft products directly to its Radio Shack outlets).

■The new **ImageWriter LQ** is the latest dot-matrix printer from Apple for Apple II and Macintosh computers. It sports a 15-inch carriage and doubles the dot density of the ImageWriter II. In fact, the ImageWriter LQ prints at ⅔ the density of Apple's expensive LaserWriter, all for only $1200 (estimated retail price at press time).

■**Strategic Simulations** (SSI) is famous for its tactical simulations. But at press time, SSI said it would release its first real-time flight simulator—B-24, with 19 World War II bombing missions—sometime this summer.

■**UpTime**'s Apple II editor, Jay Wilbur, showed us a simpler, quicker menu structure and an enhanced text-handling module—then wowed us with a mouse-, menu-, and window-based Macintosh-style redesign for the disk magazine's switch to ProDOS in early '88.

■Alan Bird and Mark Simonsen of **The Software Touch** (San Diego, CA) are jumping up and down over their new products—in Simonsen's words, "enhancements to AppleWorks that go **inside AppleWorks**," tapping AppleWorks code instead of swapping areas of memory to disk, à la Pinpoint. Besides a calculator, calendar, and picture-merge routine, you'll be able to print word-processing files at full speed with MacWrite-like fonts (and sizes up to 72 points), and print spreadsheets sideways. Bird is working on a built-in spelling checker, too. You may never leave AppleWorks again.

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NEWS LINE

banner, certificate, and miscellaneous printing programs. Print Magic's product manager told us that the CES display version lacked color printing for the ImageWriter II and other models, but that Epyx hopes to include that feature in the production edition.

Across the aisle, Broderbund showed colorful printouts from this fall's super-hires GS Print Shop ($59.95). Broderbund no longer talks about the desktop-publishing package it announced at the GS debut last September, but is working on ShowOff ($59.95), a GS presentation package for making overhead transparencies or on-screen slide shows.

After two days of publishing previews, *inCider* editors fled to the game booths just to see some programs that didn't print anything. **—E.G.**

THE CLASSICS COME CHEAP

"We wanted to create a paperback equivalent for software," says Karen Novak, Mindscape's manager of communications, referring to the company's Thunder Mountain program line.

"To extend the life cycle of the products," notes Melinda Mongelluzzo, Activision's marketing coordinator, "we offered these Solid Gold titles at a lower price."

"We include products that show the staying power to become classics," says Eric Walter, Electronic Arts' vice president of operations, of the Software Classics series.

And when Broderbund began organizing a "bargain basement" division in April, the idea officially became a trend. As a result, software publishers' older titles, primarily games, are now selling for a lot less than you would have paid when they were the latest thing. Mindscape's Novak sums it up: "If you're willing to wait, you can pay only $9.95."

Mindscape's Thunder Mountain division, launched in January, includes about 30 titles, priced at $9.95 each. They're products "that have gone through their life cycle at full price," Novak says. The current Thunder Mountain lineup includes some interactive fiction, as well as educational and productivity software.

Software Classics, introduced about a year ago, was one of the initial "low-budget" software lines. As older products sometimes "disappear from the shelves," according to Walter, Electronic Arts wanted to bring back at a lower price some of the popular titles it had accumulated over the years. It offers about 20 titles, including Archon, One-on-One, and Seven Cities of Gold, priced at $14.95 each.

Activision has put some of its older games, including Hacker, Ghostbusters, and The Great American Road Race, into the Solid Gold line ($14.95 each). Activision currently has no plans, however, to include titles from its Gamestar, Personal Choice, or Creativity divisions in the Solid Gold collection.

So who'll buy this low-budget software? While Mindscape plans to target the home audience, as it does with its other products, Electronic Arts says it hopes to bring in new users. Activision's Solid Gold is aimed at a younger audience. "People don't want to spend $40–$50 on a program all the time," says Mindscape's Novak. "This lets people buy four programs at a time." **—L.L.**

Circle 273 on Reader Service Card.

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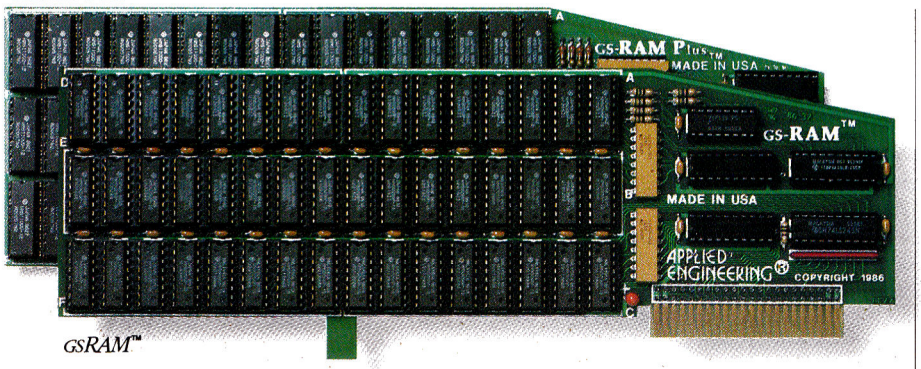

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Steve Wozniak, the creator of Apple Computer

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APPLE CLINIC

by Paul Statt, Technical Editor

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.*

Echo, Echo

I have an Apple IIc with Cricket speech synthesizer. I'm a pretty good BASIC programmer, but I can't set up my IIc to enable the Cricket along with the modem. I can hook up either the modem or the Cricket to port 1—but can I have both? My goal is to set up the system so that the Cricket will "say" what's coming in over the modem. How can I access two ports during a connection?

Matt Barkdull
Fairbanks, AK

Your question is similar to one we published in the May 1987 Apple Clinic ("PR#1 and Video, Too," p. 20): A teacher wanted to direct output to the IIc screen and the video monitor simultaneously. The solution, for which I thank the legion of loyal Clinic readers who wrote in, is called screen echoing.

The key to screen echoing is the "Control-I" character. Here's a simple BASIC program, submitted by Jim Bernier of Watertown, New York, that directs output to the printer in slot 1 and the video monitor in slot zero:

```
10 PRINT CHR$(4);"PR#1"
20 PRINT CHR$(9);"I"
```

Jim points out, "You must repeat the sequence every time you issue a PR#1, as the PR#1 command will reset the port to the default—'echo off.' "

Now if you want to output data simultaneously to ports 1 and 2 on your IIc—your modem in port 1 and your Cricket in port 2, say—use Control-A:

```
10 PRINT CHR$(4);"PR#1" REM Sends
   data to modem, port 1
20 PRINT CHR$(9);"A" REM Sends data
   to Cricket, port 2
30 PRINT CHR$(9);"I" REM Sends data to
   the screen
```

I realize this program doesn't exactly solve your problem of getting information from the modem, displaying it on screen, and reading it aloud, too. But, given the difficulties of timing (do your modem and Cricket have exactly the same baud rate?) you may do better to get the information into a file in your Apple first, then output it. A five-second delay won't slow you down too much.

Uniform Printing

In the June 1987 Apple Clinic, you responded to Gary Solomon that the ImageWriter II prints in two directions, and sometimes better in one direction than the other ("Spitting ImageWriter," p. 22).

Why not tell the printer to print in only one direction, not bidirectionally? Then, at least, all the printing would be uniform.

The printer-control string for unidirectional printing is ESC >, or, in decimal, CHR$(27) CHR$(62). If Mr. Solomon can't use printer codes in his application program, using them from BASIC is pretty simple. Just run the following program before booting the application:

```
10 PRINT CHR$(4);"PR#1"
20 PRINT CHR$(27);">"
30 PRINT CHR$(4);"PR#0"
```

Janet Calvert
Bloomfield, NJ

Thanks, Janet, for an easy and elegant solution. I recommend unidirectional printing to any ImageWriter II user who wants the best possible print quality.

GS Tools: The Decline of BASIC

In everything I read about the Apple IIGS, I learn about ROM (read-only memory) tools, which are built into GS memory and are available to users. Of particular interest to me are the clock routines—ReadTimeHex, WriteTimeHex, and ReadASCIITime. I'm most anxious to use ReadASCIITime, which returns the time in ASCII format for use in applications. Please explain how to use this helpful tool in an Applesoft BASIC program.

George D. Alcala
Corpus Christi, TX

You can't use GS ROM tools in BASIC programs. BASIC is built into GS ROM, but it's in the GS' Apple II emulation mode.

In short, BASIC knows nothing of what makes the GS different from other IIs: not the fancy color graphics (QuickDraw), nor the Ensoniq sound chip, nor the built-in clock.

To use the GS tools, you need assembler or Pascal, one of the languages that work with the GS programming utility packages Apple Programmer's Workshop (Apple Programmer Developers Association, 290 S.W. 43rd Street, Renton, WA 98055, 206-251-6548) and ORCA/M (ByteWorks, 4700 Irving Boulevard N.W., Suite 207, Albuquerque, NM 87114, 505-898-8183). Apple and ByteWorks have promised a C compiler to come; nobody has produced a BASIC compiler yet, but I wouldn't be surprised to see one.

Learning Pascal seems to be the best way to program on the GS if you know BASIC but are shy about using assembler. That's why our monthly tutorial column Mastering the IIGS leans heavily on Pascal.

RAM Fades Away

I own an Apple IIGS. I want to keep data in RAM at all times—so that even when I turn the machine off, I won't lose any information. I also want to switch from one program to another in RAM and use the same accessories—calculator, notepad, and phone directory—from program to program. Does anybody make that kind of product?

Robert Alexander Wyatt
Berryville, VA

You can keep data permanently in memory in at least two ways. (See "More Memory, More Power," p. 44.) The old-fashioned method is "burning an EPROM": putting the program or data you want to save into a ROM chip. Another way is to add a small

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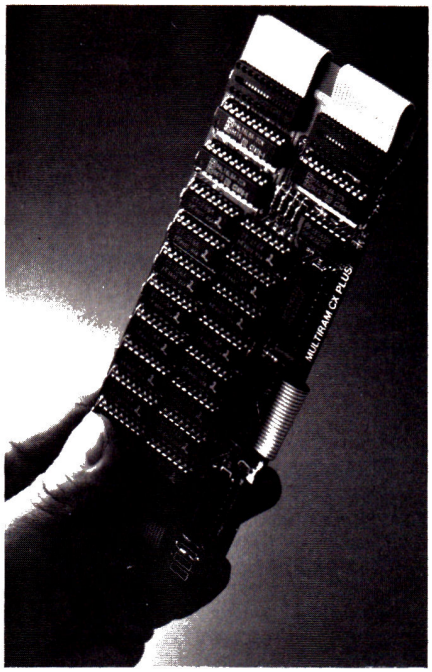

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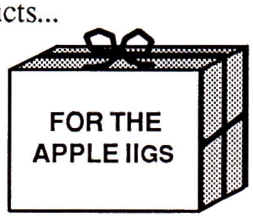

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Program listing. *Speeding up the AppleWorks cursor.*

```
10  D$ = CHR$ (4)
20  PRINT D$;"BLOAD /APPLEWORKS/APLWORKS.SYSTEM,TSYS,A$1000"
30  POKE 7995,0
40  POKE 8000,0
50  PRINT D$;"BSAVE /APPLEWORKS/APLWORKS.SYSTEM,TSYS,A$1000"
```

battery to a RAM card, to supply just enough power to keep the data stored there intact. Almost every company that makes GS memory-expansion boards makes battery-backed RAM (random-access memory) cards (or soon will)—just what you're looking for.

Whatever method you use, put your desk-accessory software permanently in RAM. You might find that the GS Desktop software that comes on the IIGS System Disk is also very useful when you don't have to take the time to load it.

Apple Writer to AppleWorks

I've used the Apple II System Utilities and ProDOS User's Disk to change my DOS 3.3 Apple Writer disks to ProDOS. I then deleted the HELLO program and the printer instructions from the old Apple Writer.

AppleWorks catalogs all the files when I ask it to "list all files on the current disk." But when I try to create an AppleWorks file from that disk, AppleWorks tells me it "can't locate that file." What am I doing wrong?

Robert Allardyce
Pittsfield, MA

If AppleWorks has been reporting to you that it can't find a file—as opposed to not being able to load it—and you know the file's there, you're probably typing the wrong pathname.

ProDOS is a lot fussier about pathnames than AppleWorks is. AppleWorks users are spoiled by the program's leniency until they come up against real ProDOS.

ProDOS pathnames use only capital letters; AppleWorks uses caps and lowercase. ProDOS doesn't know what a space is; if ProDOS finds a space in an AppleWorks filename, ProDOS assumes it's a period. ProDOS pathnames begin with a slash; AppleWorks supplies those for you.

If you want to make a new word-processor file from an ASCII text file, put the disk into your usual data drive, say, drive 2. From the AppleWorks Other Activities menu, "list all files on the current disk drive." Look at the top of the list; you should see something like "disk volume /test [your disk name] has 100K available."

Look at the directory, and make sure the file you want is there. Write down its name exactly, as well as the name of the disk.

Return to the AppleWorks main menu, choose "add files to the desktop," then "make a new file for the word processor." Select "from a text (ASCII) file on disk."

At the next menu, carefully type the exact pathname of the file you want. That's all you need to do.

Slow Cursor

I have an Apple IIc with a ProDOS clock attached through port 2. My wife noticed that when the clock is running, the AppleWorks cursor blinks considerably more slowly than it does normally. Can I do something to make the cursor move faster?

Bob Frank
Chicago, IL

We went to a guy who knows AppleWorks the way Jim Rice knows Fenway Park—Randy Brandt, author of MacroWorks, Super MacroWorks, PathFinder, and probably even more programs by the time you read this.

Randy quickly found the memory locations in AppleWorks that slow down the cursor; we wrote a little program (see the accompanying **Program listing***) that POKEs zeros into those locations. Type it in and run it, making sure your AppleWorks Startup disk is in one of your drives and that you're using your /APPLEWORKS /APLWORKS.SYSTEM file's pathname.*

That does it for AppleWorks version 2.0. For version 1.3, try POKEing 7970 and 7975 with zeros. If the cursor moves too fast to see, try changing only one memory location to zero. To slow it back down, just POKE 7995,241 and POKE 8000,236—those are the default "speeds."■

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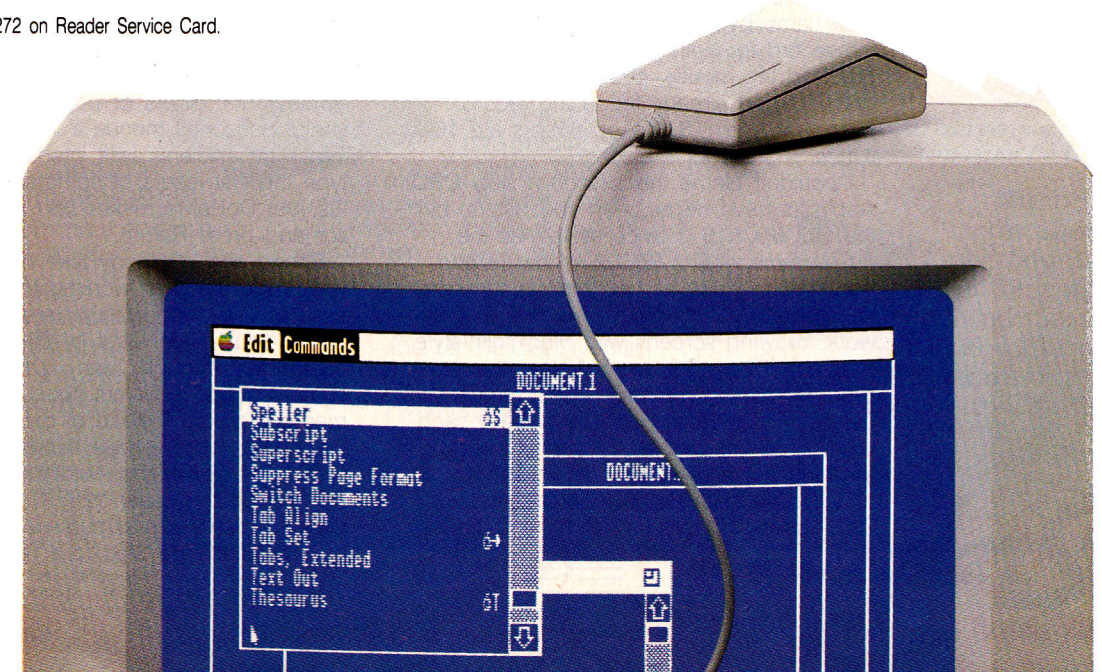

Faster! Faster!

by Eric Grevstad, Review Editor



"Clock speed is only part of a computer's performance; system performance, in turn, is only part of productivity."

All computers are fast. It's not just that they can speed through jobs that are humanly impractical—multiplying giant numbers that would take three years with paper and pencil, that sort of thing. It's also that they're fast enough to overcome their low intelligence—the handicap of having to break down even simple jobs into tiny steps with clumsy zeros and ones. I can divide 197 by 13. My Apple has to repeatedly subtract 00001101 from 11000101, and still finishes before I do.

To most of us, however, a computer's speed means how long it takes to recalculate our spreadsheets. This day-to-day speed limit involves two factors. The one people usually talk about, clock rate or CPU speed, is easy to measure, but easily overrated. The other, the way you use your software, is more subjective, but just as important. Both factors came to my attention when the tech editor whipped me in a database race the other day.

I was playing with Notes 'n' Files, a new IIgs database from DataPak Software. It's an attractive program—graphics, windows, and icons galore, plus the extra dimension of memos or letters stored with each database record. (We'll publish a review soon.)

Anyway, I'd imported an AppleWorks database from the IIe beside me, so Paul Statt came by and said, "Let's race. Find the record for Spinnaker Software." I grabbed the mouse, clicked on a cabinet, but Paul had already found the record. Time and again, 8-bit AppleWorks ate 16-bit Notes 'n' Files for breakfast.

I couldn't blame the loss on a slow CPU. Apple IIs have never been speedsters, but the GS' 65C816 is twice as fast as the pokey 1-megahertz 65C02 in the IIe and IIc. Working twice as fast, though, doesn't help when you're doing five times as much work, drawing screens with Macintosh-style graphics. Every GS owner knows the program-loading message "One moment please . . ." means "Time to make a sandwich." The GS Desktop, if you're using anything but a RAM disk, is unusable.

But let's put things into perspective. Clock speed is only part of a computer's performance; I rarely complain about the GS' 2.8-MHz throttle, because I'm busy complaining about its scant 256K standard memory. System performance, in turn, is only part of productivity. A Laser EX or a IIe with Applied Engineering's TransWarp card sorts a database in one-third the time of a plain IIe or IIc, but that saves only a few seconds out of an afternoon spent creating the database and entering records. Computers see minutes the way we see weeks; they spend most of their time yawning and waiting for input instead of crunching numbers.

For getting work done, CPU speed means less than style—your software's user interface, whether it makes you work through menus, shortcut apple- or control-key commands, or a mouse. A computer that dozes between a fast typist's keystrokes positively snores during the time it takes to remove your hand from the keyboard and maneuver a mouse, but the mouse is quicker than the hand at jobs like marking a block of text.

The real roadblock to getting work done is software that lacks a consistent interface. Surely there must be an easier way to work than booting ProDOS 16, pointing and clicking on the GS System Utilities, then watching the machine boot ProDOS 8 and present an arrow-key menu just as you were getting used to using the mouse. The new integrated package DoReMe skips AppleWorks folders or pop-up menus in favor of horizontal menus à la Lotus 1-2-3. That's an efficient, swift interface if you can type the first letters of commands, as in Lotus, but DoReMe makes you move the cursor and press Return.

Speed and efficiency take hardware, software, and the user working together. If ease of use and ingenuity are what you crave, you'll find Notes 'n' Files' mouse control fast enough. Many AppleWorks addicts may find sufficient speed by adding a macro program instead of extra hardware. Personally, I like to take things to the limit, with AppleWorks and AutoWorks macros running on the Laser 128EX, with its triple-speed processor and numeric keypad. I intend to challenge Statt to a rematch.■

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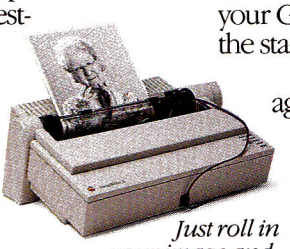

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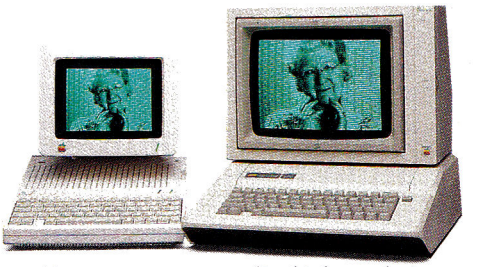

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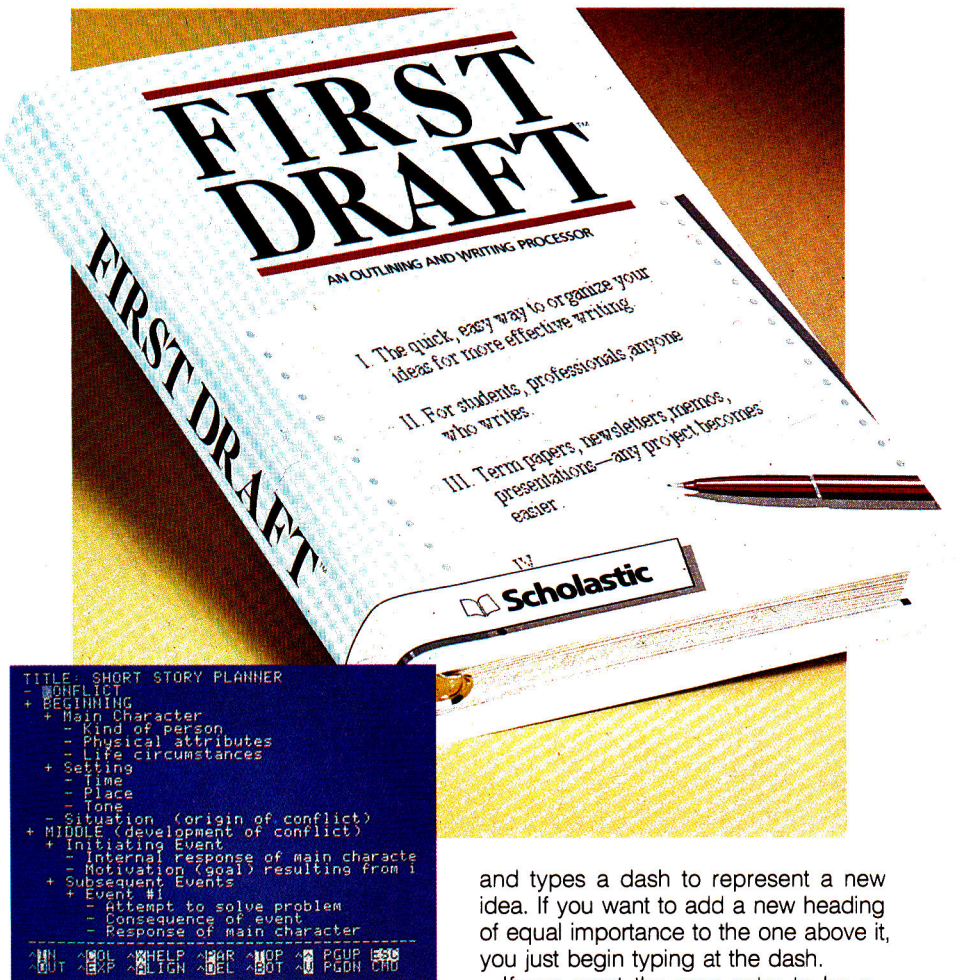

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The documentation for both versions contains a Quick Start Tutorial for those who aren't familiar with computers and software. This step-by-step course gets inexperienced users up to speed efficiently. If you want to skip the tutorial, you can jump straight into setting up your own outline; the *Reference Guide* describes the program's features in good detail. If you're unfamiliar with outlining programs, though, you'll want to read the tutorial to get an idea of how features such as collapsing and expanding outlines work.

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If you want the new entry to be a subheading of the previous heading, press Control-I to indent the current line and change the previous heading's dash to a plus sign. If you want to add a paragraph of text to a heading, press Control-P. This changes the dash to an asterisk, though the asterisk won't appear when you print your outline.

If you're new to outlining software, it can take a little time to feel comfortable with the program. At first, you'll probably have a screen full of dashes and plus signs that seem to make no sense. It takes just a few minutes, though, to get used to First Draft's logic; you'll have headings, subheadings, and paragraphs in line in no time.

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For example, say your assignment is to write a paper about dogs. When First Draft asks for the name of the file, type "Dogs." Now the brainstorming part begins. Type whatever comes to mind—"Breed," "Care," and so on.

Next, go back and add details for each category, creating subheadings and paragraphs. Move the cursor to "Breed" and press Return and Control-I, indenting the line below for subheadings such as "Collie" and "Golden Retriever." If you want to add text describing a subheading, type Control-P and begin a paragraph about, say, the characteristics of golden retrievers. It doesn't take much time to turn an idea into a complete outline.

THE MENUS

A menu at the bottom of the outline screen offers a choice of functions you execute using your Apple's control key. The only ones that aren't self-explanatory are Collapse and Expand. Control-C collapses your outline, concealing as many sublevels as you want—in the sample above, hiding first the paragraph about golden retrievers, then the names of the breeds. This option is helpful when you want to focus on only the main ideas of your paper. Control-E does the reverse, expanding one level at a time.

Pressing the escape key replaces the function menu with a command menu. From here, you can move, copy, or delete sections of your outline, find specific words, rank headings, initialize a data disk, print or save a file, or erase it from memory or from disk.

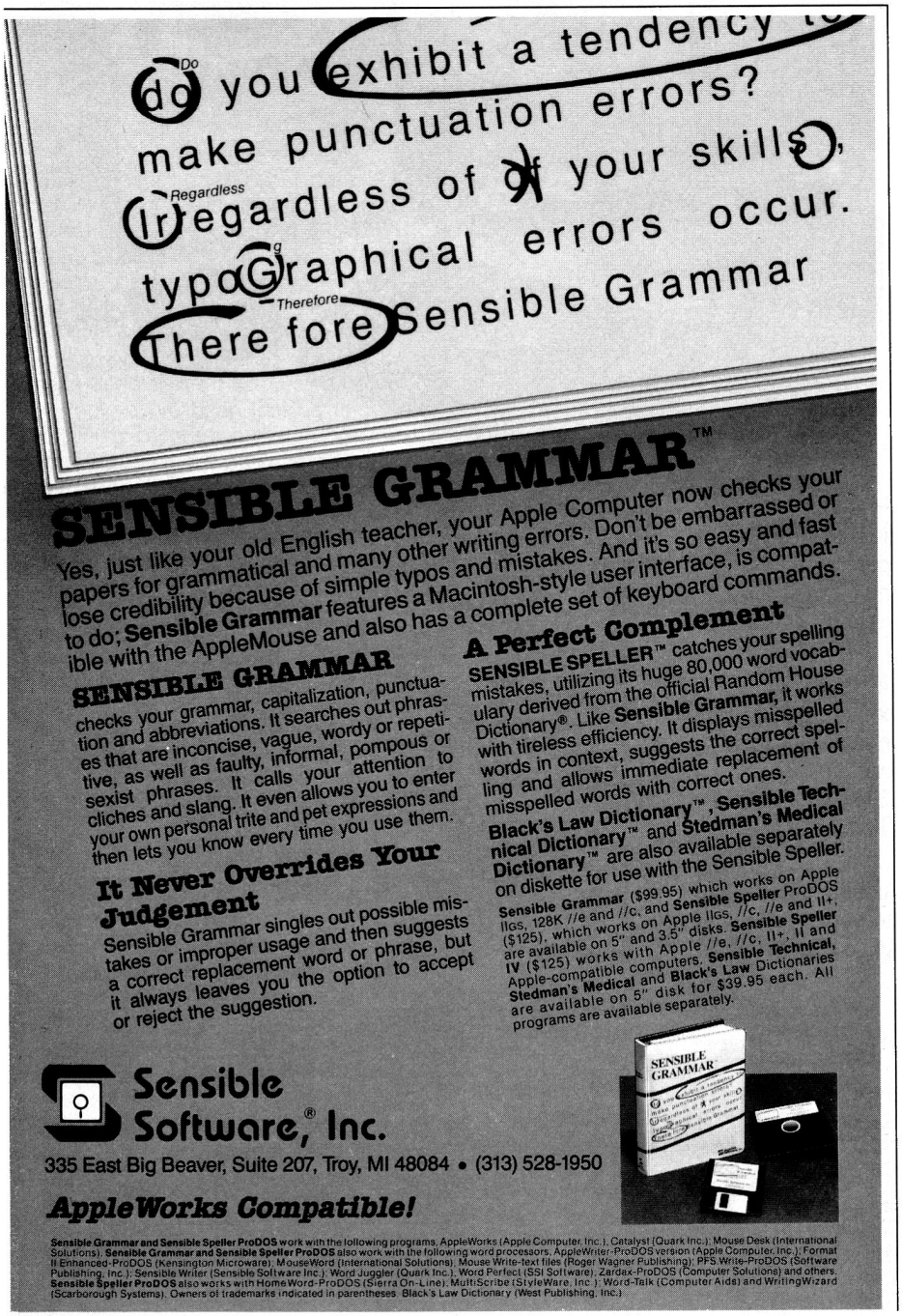
First Draft's commands do an adequate job of outline editing. The ranking command, for instance, gives extra freedom during the brainstorming process, letting you rearrange subheadings either numerically or alphabetically. However, Scholastic could have added a few more options. For example, while there's a Find command, there's no Replace. The Find command itself is limited: It locates only the first occurrence of a word and returns you to the outline screen, without giving you the opportunity to continue to the next occurrence.

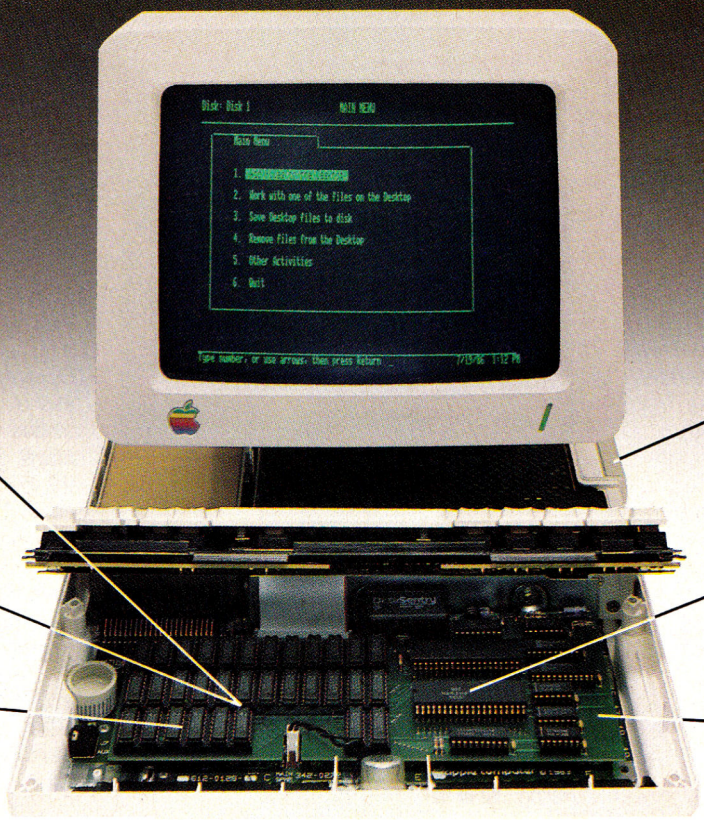
When you finish your outline, Scholastic (recognizing First Draft's limitations) recommends that you transfer the file to a word processor for further revision. The program includes an option to save in binary format so that you can use First Draft files with the DOS 3.3 version of Bank Street Writer II; to use them with Bank Street Writer III, AppleWorks, or other ProDOS word processors, you'll need the conversion utility on Apple's ProDOS User's Disk.

LOOKING AHEAD

Scholastic says a ProDOS version of First Draft should be available by the beginning of the 1987–88 school year. This version will make it easier to use First Draft files with other word processors. It may also eliminate some minor shortcomings of the DOS 3.3 version.

For example, when you boot the program disk, you're given an opportunity to configure the program for your system, telling First Draft whether you have an 80-column card, which slot number to use for your printer, whether you want to save files in binary format, and so on. Once you've saved your setup and moved on to





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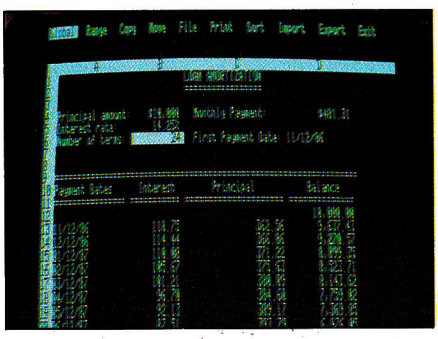
the outline screen, there's no way to return to the configuration menu without rebooting.

Also, if you finish your "Dogs" outline and want to start work on a science paper, there's no graceful way to put the dogs out and begin a new outline. You must save "Dogs," erase it from memory, and begin a new file you'll save under a different name.

These are minor problems, though. If you allow some time to get used to the outlining concept, and remember that First Draft isn't intended to be a full-featured word processor, the package offers an easy-to-use, well-documented writing aid. First Draft can't turn a hack writer into Hemingway, but it can give you, your kids, or your students a jump start to get those creative juices flowing.■

Dan Muse
inCider *staff*



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DoReMe, a new DOS 3.3 package sold by a one-man software company, is the first reasonable alternative to AppleWorks I've seen. Programmer Stan Kalwinski's creation is well integrated, easy to master, impressively powerful, and outrageously cheap.

Like AppleWorks, DoReMe is three programs in one—a spreadsheet (Spread), a word processor (Word), and a refreshingly flexible, flat-file database (DBMS). All three modules share data via the Clipboard, a memory buffer that holds data for transfer within DoReMe.

Unlike AppleWorks' stacking file cards, DoReMe's menus are placed horizontally atop the screen like Lotus 1-2-3's or Bank Street Writer's. Press the escape key to enter command mode; the cursor arrows and return key highlight and select choices or submenus. (File, for instance, brings a menu with options such as Save, Print, and Delete.) Power users may be disappointed that shortcut control-, apple-, or slash-key commands, or mouse support to speed option selection, are largely unavailable.

ROWS AND COLUMNS

DoReMe's spreadsheet module offers familiar functions in a familiar layout. Worksheet size depends on available memory; a 64K Apple IIe holds 32 columns by 64 rows, while a 128K spreadsheet measures 32 by 255. A large auxiliary-slot memory card such as Applied Engineering's RAMWorks or Checkmate Technology's MultiRAM with 704K lets you make monster worksheets of 255 columns by 255 rows.

Spread has a few quirks. For one thing, a + or @ sign must precede each formula. The formula –(C4 – C3), which works fine in AppleWorks, won't budge in DoReMe. Instead, you must type the strange-looking expression + –(C4 – C3). The data-entry line also shows a single quotation mark, used as a preface when entering a number (such as the year 1987) as a label. Other spreadsheets I've used also require single quotes, but don't show them; DoReMe's display certainly isn't "wrong," but it looks funny and lets you accidentally change a label to a number during cell editing.

There are more important positive features. Spread is a well-rounded worksheet with 38 built-in mathematical, statistical, financial, lookup, and date functions. Some of Spread's financial operations, such as @PMT to calculate loan payments and @FVS to

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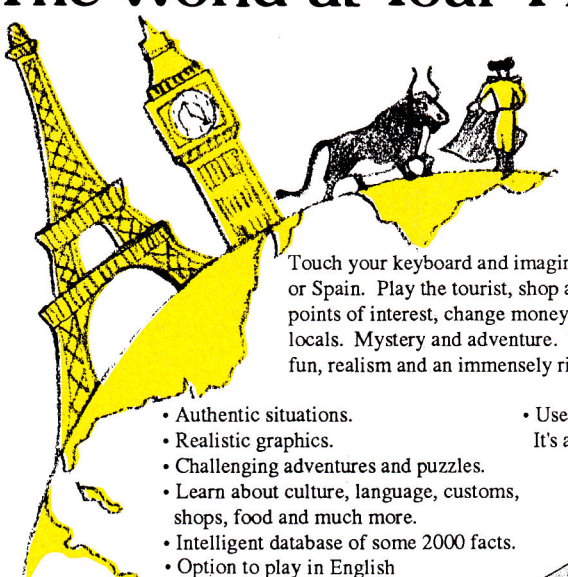

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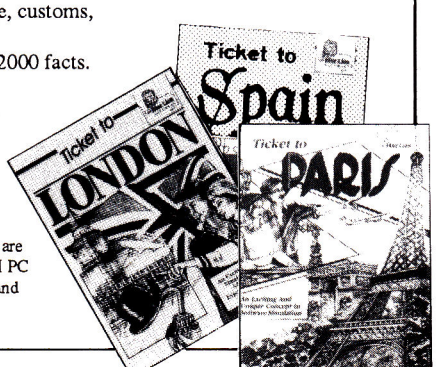

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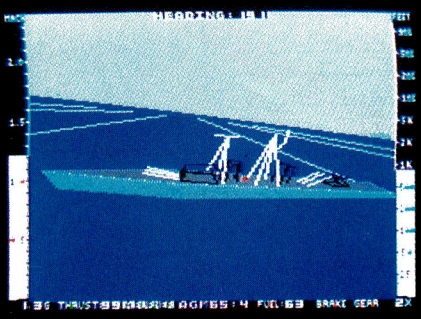

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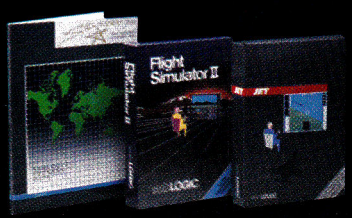

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compute the future value of a one-time investment, are lacking in most other Apple spreadsheets.

WORDS AND KEYS

Like Spread worksheets, Word files are limited by your Apple's RAM—from 204 lines with 64K to 816 with 128K, or more than 2600 lines with 256K of auxiliary memory. These restrictions are in some ways academic, because DoReMe's logical and physical file-merge capabilities let you chain files to print documents of virtually unlimited size. Page numbering goes up to 65,500—enough for *War and Peace*, to say nothing of your business reports or term papers.

DoReMe Word is a capable word processor that should meet your expectations in terms of features and performance. It handles basic functions well, and its Stats option—a pop-up window showing document size and available Clipboard memory—is one feature I'd use often. It has no built-in spelling checker, but the ability to save files in ASCII format lets you proof Word files with stand-alone checkers such as Sensible Speller.

Besides supporting most common printers, its custom-printer configuration program is among the easiest I've used; both my ImageWriter II and custom daisywheel (the Brother HR-10) worked fine. DoReMe is the only Apple program I know that supports Hewlett-Packard and compatible laser printers, which cost considerably less than Apple's LaserWriter Plus.

On the other hand, Word's greatest strengths—its 35 embedded formatting commands—are also its biggest annoyances. It's great to have these options available; it's something else to consider memorizing them. DoReMe kindly offers on-line help, including a pop-up list of formatting commands, but I still prefer AppleWorks' Open apple-O options menu or Control-B boldface toggle to DoReMe's *@sb* and *@eb* to start and end boldface.

Another feature that bothers me is Word's default typeover mode. Sure, you can toggle easily to insert mode, which I prefer for fixing typos and mess-ups, but the program reverted to the default each time I began a new document. Word also seems to work backward when it comes to deleting characters. Most Apple programs I know use the delete key as a destructive backspace, erasing a character to the left of the cursor. DoReMe, modeled after IBM PC programs and keyboards with separate delete and backspace keys, has a "forward" delete key, erasing the character under the cursor.

My final gripe with Word concerns its inability to display tab settings on the on-screen "ruler." Word highlights every tenth column to give you an idea of where you're typing on a page, but that doesn't help much if you're trying to line up tabular data. Overall, though, my complaints about Word probably reflect my being spoiled by AppleWorks, WordPerfect, and mouse-driven word processors, which don't force you to memorize a flock of embedded commands.

DATA AND DATES

While I prefer AppleWorks' word processor to DoReMe Word, I can't say the same for AppleWorks' database. DoReMe DBMS is friendlier and more capable. Each DBMS file can have up to 6000 records, each of which can contain as many as 64 fields with a maximum of 2048 bytes (characters) of data.

Changing your mind about field names, sizes, and contents is no big deal. Menu choices are logically presented and easy to understand. DoReMe DBMS also lets you use formulas that include simple arithmetic operations, logical operators, and appropriate DoReMe Spread functions to set up calculated fields.

Like AppleWorks 2.0, DoReMe has built-in mail-merge functions, supporting either automated merges or controlled ones (via the keyboard). You can update a file globally and create custom reports, including mailing labels. Multiple selection criteria let you perform a preliminary screening of your database records, then define a two-key (major and minor) sort to further refine your search and the resulting report.

DoReMe offers extras AppleWorks lacks. Its pop-up calendar doesn't track appointments—you can't jot

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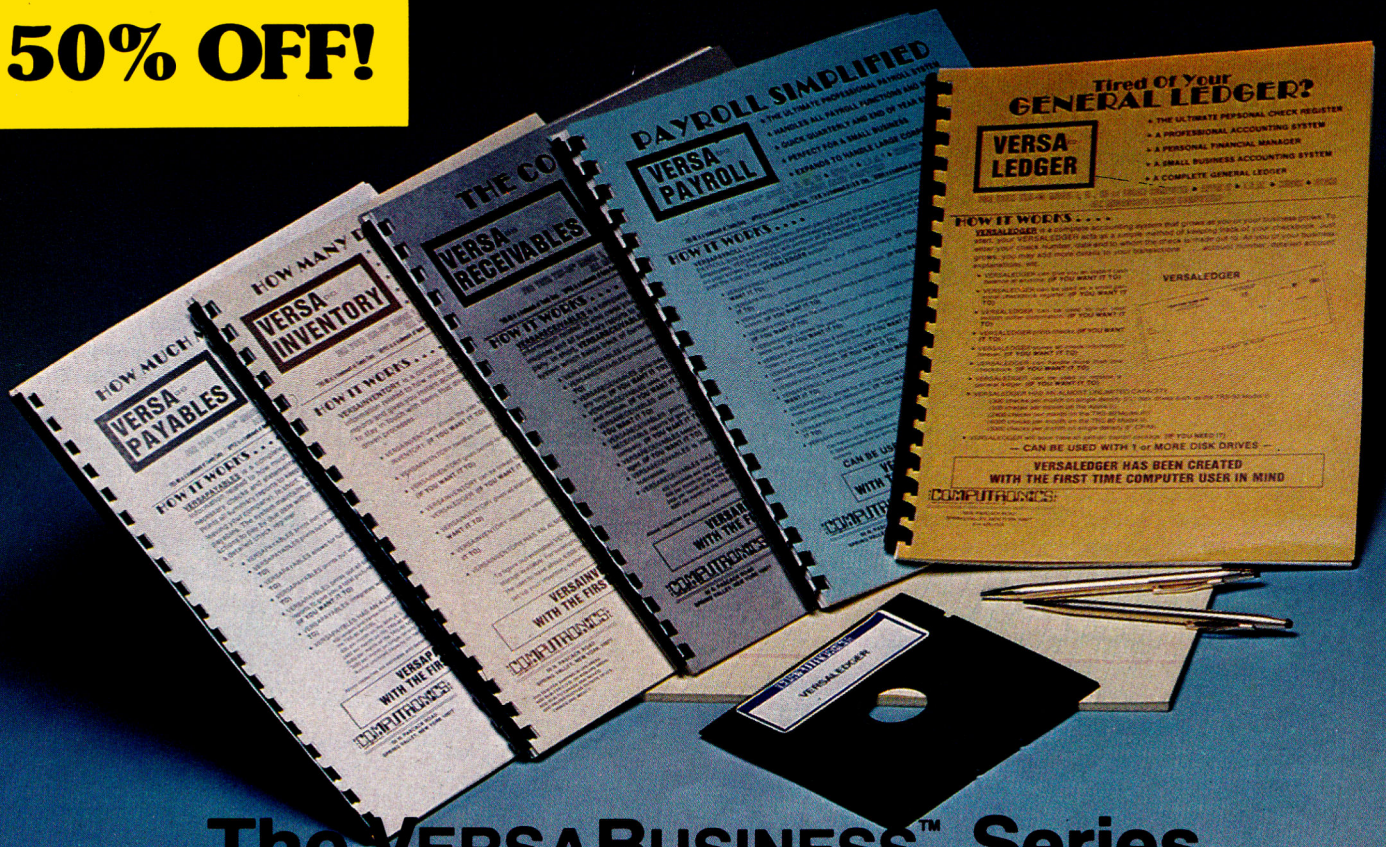

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down reminders of meetings or events as you can with Pinpoint Publishing's AppleWorks add-on—but it's a handy quick reference for determining next Wednesday's date when setting up a business meeting.

A second desktop accessory is DoReMe's pop-up table of ASCII codes. Unless you're a programmer who writes technical documents, your reaction may mirror mine: "Oh, sure, a pop-up ASCII table—couldn't live without it." The popular MS-DOS program SideKick aside, most of us need such a chart only when configuring a custom printer. Ironically, you can't access the ASCII table from DoReMe's setup screen.

DESK AND DOS

DoReMe lacks a desktop in the AppleWorks sense; instead of having as many as a dozen different files available at one time, DoReMe limits you to one. You can't simply switch back and forth among databases, documents, and spreadsheets as you can with AppleWorks; you must exit one application and start another.

DoReMe's Clipboard, however, is as easy to use as AppleWorks', and thus helps to harmonize data transfer from one module to another. You can import files from or export them to other Apple programs in DIF, ASCII, or VisiCalc format, as well.

DoReMe is noncopy-protected and comes with program and sample-files disks. The initial version, which I tested, runs under DOS 3.3, but as author Kalwinski told me, "It's crying for ProDOS." As is, the DOS 3.3 format severely limits DoReMe's abilities with the IIGS and 3½-inch drives. (The program saw my GS as a 128K system, missing the extra memory.) Kalwinski hinted that the forthcoming ProDOS version, which should support 3½-inch disks, may include additional accessories, such as a pop-up calculator or appointment calendar.

According to Kalwinski, ProDOS DoReMe won't be ready until the end of this year. What happens if you purchase today's DOS 3.3 version and want to upgrade later? When I spoke with him, Kalwinski hadn't set his policy in stone, but suggested he may follow the practice of other publishers who charge half price for operating-system upgrades. At DoReMe's price ($49 plus shipping), that won't be too hard to take.

In other respects, Multisoft's support services are praiseworthy. When I called the company, Kalwinski himself answered the phone and set to work immediately on the few bugs I encountered, then sent a replacement disk. He volunteered that he'd already fixed "hundreds" of bugs, but welcomed my comments (even my assertion that the program's name is misspelled, which he attributed to poetic license).

The cynical expression "you get what you pay for" clearly doesn't apply to DoReMe. At a fifth the price of AppleWorks, Multisoft's integrated program gives you a lot more than you'd expect. The DOS 3.3 version is a steal; the later ProDOS version may be grand theft. ■

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Author! Author!: $59.99
Rating: ■■■■

Methods and Solutions, makers of the popular MindPlay series of educational programs (see review, September 1986, p. 95), is now helping children with creative writing—the whole writing process, from learning the keyboard and word processing to becoming a playwright.

Text Tiger combines a simple word processor with help in typing, editing, and language-arts skills. Author! Author! is a complete playwriting workshop, complete with animated graphics characters, props, sets, editing, and outlining. Both are ingenious, flexible teaching tools for ages seven and up.

FIRST WORD PROCESSING

Text Tiger includes four game-like activities that serve as warmup exercises for the word processor on the flip side of the disk. Students become "text tigers" when they're familiar with the basics of word processing.

The four activities are "Keyboard Quest," offering several levels of instruction in touch typing; "Tiffy Text," creating nonsensical paragraphs from random nouns, adjectives, verbs, and adverbs; "Cursor Rally," practice with the arrow keys and other cursor movement; and "Eagle-Eye Editor," short-story editing with erase, insert, move, and copy commands.

Keyboard Quest isn't as sophisticated as some dedicated typing programs, but will help students improve their typing skills for later computer activities. Its nine cumulative lessons teach individual keys and key combinations—first the home row, then others—rather than words, word combinations, or paragraphs.

Cursor Rally challenges kids to move the cursor around a paragraph, hitting targets while avoiding gates and beating a time limit. Younger students with less-developed reading skills will enjoy this game because you don't have to read the paragraph to find the flashing target.

The least enjoyable activity on the disk probably offers the most training in editing techniques. In Eagle-Eye Editor, students must make four corrections to one of 12 word-processing documents in as short a time as possible. Although there might be many

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SOFTRONICS

ways to make these corrections in a conventional word processor, the game requires that you do so in a certain way. For that reason it's too restrictive.

To make corrections, you must erase, insert, copy, or move letters, spaces, and words, pressing the escape key to move from the writing screen to the edit menu. As you work, the time clock ticks on. There's no way to stop the timer to catch your breath, answer the phone, or collect your wits.

Sound effects help with editing choices, and a "clue" option is available to provide assistance. But even when I relied on the program's clues, I couldn't always figure out what had to be fixed, copied, or moved; the computer and I disagreed regularly over the most appropriate editing to do. The program did achieve its goals, however. After using Eagle-Eye Editor, I was able to use Text Tiger's word processor with confidence.

Text Tiger succeeds because it teaches a variety of computing skills. Its game-like format is well suited to primary- and middle-school students, and its on-screen commands are simple to master. High-school students should find the word processor a bit too simple for their needs, but even they'll be able to improve their typing skills with the package's keyboard drill.

Like all MindPlay programs, Text Tiger has a "Challenge Upgrade" feature, letting a teacher or supervising adult customize each game activity for individual user needs. Older and more adept students can play faster games with shorter time limits; teachers can toggle sound on or off or print student performance records for the last 20 games played. Challenge Upgrade settings remain in effect until you change them.

All the Text Tiger games ran smoothly, but I crashed the program occasionally with the word processor's Init, Save, and Load commands. MindPlay's technicians had never experienced the problem and couldn't replicate it on their machines, though it happened with two copies of Text Tiger on four different Apples. In fairness to them and this otherwise well-designed program, it's still not clear whether the fault lies with Text Tiger, my drives, or my data disks.

THE PLAY'S THE THING

Author! Author! gives students practice in writing plays, casting characters, building sets, and producing playbills. It's filled with so many activities that you may wonder how the designers were able to squeeze it all into 48K.

While only older students will be able to take full advantage of the program and its built-in word processor, youngsters with less-developed reading skills can have fun creating their own stage sets. They can choose from 14 backdrop scenes or design their own, and add up to 30 movable graphics from a library of 51 props (such as trees, furniture, and vehicles) and 43 characters (including adults, children, a king and queen, dog,

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dragon, dinosaur, and ghost). The graphics animation is very simple, yet entertaining.

The main menu offers four activities: writing or editing a play, seeing a play, seeing eight pages of on-screen instructions (a print option for hard-copy would be helpful), and the Challenge Upgrade. The Upgrade lets teachers adjust sound, text scrolling speed, whether plays can use only text or include graphics and stages, and whether the student can use a second disk drive for data disks. (Each play requires its own data disk; another Upgrade choice formats a disk.)

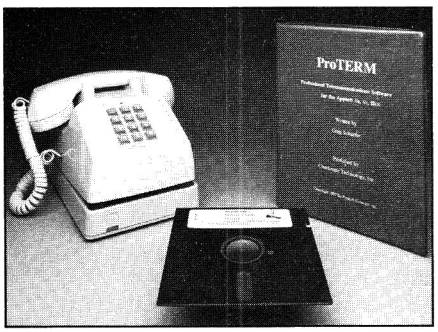
Users can also keep the standard eight-question outline or create and edit a new outline to help focus their thinking and organize their ideas before writing a play. In the sample outline, students are asked to choose a dramatic form (tragedy, comedy, melodrama); whether they intend to use conflict, crisis, and conflict resolution; their play's leading characters and their personalities; how and when the play begins; and the play's theme or main idea. They can refer to their outline answers while writing their plays.

The three-act, 11-scene version of *Jack and the Beanstalk* on side 2 of the Author! Author! disk demonstrates the program's lesson: A play is more than just a stage performance. Watching the play as a whole or scene by scene, students see characters move around stage on the top half of the screen while dialogue and stage directions scroll below. They also see all the tasks they must manage to create their own works. When writing or editing a play, on-screen instructions and menus guide authors through outlining, selecting movable graphics, writing a script, building the stage, and printing a playbill or complete play.

After completing an outline, selecting characters and props to move around the screen, and writing and saving a play, students can print it, complete with graphics or with text only. Plays printed only with text, or a playbill listing the play, author, director, producer, and cast of characters, are printed in standard 80-column format. Scenes showing dialogue, stage directions, and graphics are printed sideways in a 20-column large-print format.

Author! Author! can't write plays for you, but it will make playwriting fun, and students will enjoy its flexible format. The accompanying user's guide and teacher's supplement offer suggestions for additional games and activities, as well as a bibliography to make the task even simpler. Move over, Tennessee Williams, this program's a winner!■

Carol S. Holzberg
Shutesbury, MA



A Communications Contender

PROTERM 1.1

Checkmate Technology Inc., 509 South Rockford Drive, Tempe, AZ 85281, (602) 966-5802

Communications program; 64K Apple IIe, IIc, IIGS, 80-column display
$109.95
Rating: ■■■

In the past year, the number of promising entries in the Apple II telecommunications derby has soared. The newest, ProTerm, has several important strengths, but the current version isn't quite the favorite in the race to the wire.

THE STARTING GATE

ProTerm is one of the easiest communications programs to learn: You initiate all commands with the open- or solid-apple keys. Although command options aren't always visible on screen, holding down either apple key opens a pop-up window listing all possible commands, many of which call other windows listing available options.

For example, a keystroke opens a window of dialing options from which you can go immediately into terminal mode, dial a service from an alphabetical list, or add a new service to the list. If you choose the latter, ProTerm presents another window, in which you enter the service name, number, and communications parameters.

Similar windows make it easy to transfer or print files and configure ProTerm to work with your system. (ProTerm works with eight serial interfaces, eight printer cards, and 18 modems, not counting generic Hayes compatibles.) Some of these windows simplify manipulation of saved, printed, or transferred data. For instance, downloaded text often includes carriage returns at the end of each line, making later editing or reformatting difficult. ProTerm is currently the only program that can automatically remove those returns while preserving paragraphs.

Unfortunately, ProTerm sometimes presents windows or requires choices that should be unnecessary. Suppose you frequently send text to a favorite service, which sends a prompt alerting you to transmit each line. Many programs record that prompt with other information about the service; ProTerm, however, requires that you re-enter it with every upload, even making it necessary to change line and character delays if the defaults don't suit you.

THE CLUBHOUSE TURN

ProTerm is distinguished from the rest of the field by four special features: macro recording, file-transfer ability, its use of memory, and a built-in program selector.

ProTerm is a front runner in its ability, unique among current Apple communications programs, to record keystrokes as you type them. Other programs let you write macros to automate a log-on sequence, but ProTerm makes it easier: Simply select "record," and ProTerm will remember your password and other input for playback later. Like other macros written with ProTerm's macro editor, you can change the log-on macro to wait for particular prompts or branch to other macros.

The drawbacks? Although each macro can be 64 characters long, ProTerm permits only eight macros for each service, assigned to the solid-apple and number keys instead of easier-to-remember letters. Macros can't include apple-key commands (to initiate file transfer, for example) and so are much more limited than those of programs such as Point-to-Point or MouseTalk.

THE BACKSTRETCH

In the paddock, ProTerm looks strong with its combination of file-transfer protocols. ProTerm is one of the few Apple terminal programs offering Ymodem, one of the most efficient transfer protocols, as well as Kermit, necessary for systems requiring 7-bit communications, and a number of variations of the Xmodem protocol, including the extended versions originally developed in ASCII Express to include information about DOS and ProDOS files.

Files in the new Binary II format are automatically converted to standard ProDOS form when downloaded. Like CommWorks and others, ProTerm can send the contents of a complete disk to another computer running ProTerm.

In the race, however, ProTerm's transfer sometimes stumbles. Neither Ymodem nor Kermit worked with all of the remote computers I tried; Checkmate Technology's support staff couldn't explain why text files downloaded with Kermit from The Source, for example, were saved with an unusual file type ($50), making them unreadable for many users.

ProTerm doesn't automatically recognize the kind of Xmodem from which it's receiving files. It permits you to save 16 different file types during downloading, but calling a file AWP doesn't make it one; ProTerm lacks the special features available in CommWorks and Point-to-Point for handling AppleWorks word-processor files.

You'll find similar quirks when sending files. Although it can adjust the length of uploaded text lines, adjusted lines are simply truncated, not broken between words. ProTerm didn't wait for GEnie line prompts when uploading, requiring an additional line delay. Later versions of ProTerm are expected to convert text files to Binary II format in uploading.

When answering calls from remote users, ProTerm lets you specify a password, welcoming message, and remote access to four pathnames for sending and receiving individual files or batches. ProTerm also supports limited emulation of six terminals, including DEC VT-52 and TeleVideo. The number of terminal features supported ranges from "few" to "some" to "many," according to the manual, which offers no details in this case, but is otherwise clear and complete.

THE FAR TURN

Computer jockeys who use their Apples to exchange messages care most about the program's management of text in memory. ProTerm stores everything that appears on screen in a review buffer. In a 64K Apple IIe, the buffer holds 5K, but if you have an auxiliary-slot memory card, the buffer grows—up to 700K with 1 megabyte of RAM. Editing, however, is limited; you'll need your word processor to edit files.

You can select text from this buffer and send it to a printer, a disk, or a separate copy buffer (5K to 46K, depending on your system's memory). You can also save incoming text directly to the copy buffer. A number of useful parameters are available for printing and saving data; for example, ProTerm recognizes AppleWorks' limits on file size and can save a file in numbered 8K segments.

ProTerm is severely handicapped by its inability to send text from memory—it can send only disk files. Suppose you find several messages waiting for you on your favorite information service. Other programs let you download mail into a review buffer, sign off, compose responses in an editor, and reconnect to send them back. With ProTerm, you must either reply while on line or save the messages, quit the program, boot a word processor to write the replies, and reload ProTerm to send them again.

If you must switch programs, ProTerm simplifies the process with a handy program selector called Squirt, similar to the popular Bird's Better BYE, but more elegant. When you quit ProTerm, Squirt displays all available disk volumes and lets you choose a volume, subdirectory, and system file to execute with a single keystroke. If you don't boot your system with ProTerm, you can buy a separate version of Squirt ($8.50) and add it to any ProDOS disk.

You can copy ProTerm to a hard disk or RAM disk. (In fact, the ProTerm package includes a copy of the



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ProDOS Filer.) Although you can save files to a RAM disk—another on-line timesaver—ProTerm is prey to problems when doing so. I created a RAM disk on my RAMWorks card with both Applied Engineering and ProSel software; in both cases, ProTerm lost access to /RAM. According to Checkmate, IIGS users have reported RAM-disk problems with version 1.1d, as well.

THE HOME STRETCH

ProTerm has unique strengths that could enable it to pull ahead of the competition—yet for every surge ahead, some weakness pulls it back. Its many file-transfer protocols make ProTerm attractive, but they don't seem consistently reliable. The huge review buffer available with extra memory is very helpful, but primitive editing and its inability to send text from memory cripple many uses.

Many recent communications programs have shown remarkable improvement after an upgrade followed their initial releases. ProTerm, not now among the leaders, has special promise to excel, especially in its combination of simplicity of operation with sophisticated file transfer.■

Tom Sherman
Swarthmore, PA

Adding to AppleWorks

EXTRAWORKS

Electronic Management Workshop, 25 Kensington Avenue, Suite 503, Jersey City, NJ 07304, (201) 434-5110

Printing utility; AppleWorks 1.2, 1.3, or 2.0, ImageWriter II or Epson RX, FX, MX with Graftrax Plus
$20
Rating: ■■■■

PATHFINDER 1.1

JEM Software, P.O. Box 20920, El Cajon, CA 92021, (619) 447-5525

ProDOS directory manager; AppleWorks 2.0
$20
Rating: ■■■■

In the sea of add-ons, macros, and templates for AppleWorks, you can find utilities that let Apple's integrated package do just about anything. Two new add-ons, ExtraWorks and PathFinder, add different capabilities for those using AppleWorks with popular dot-matrix printers or ProDOS 3½-inch or hard disks, respectively. They're simple mail-order patches with documentation on disk, but they both work nicely. Neither is copy-protected, and they cost only $20 each.

COLORS AND CHARACTERS

Printing with AppleWorks is a simple, if somewhat limited, process; underlining, boldface, sub- and superscripts, proportional spacing, and centering are about as wild as it gets. Even if your ImageWriter II has a color ribbon, AppleWorks lets you print only five shades of black.

The ExtraWorks utility, by contrast, lets you change up to four of AppleWorks' (version 1.2 or later) predefined printing commands to produce a variety of colors, half-height super- or subscripts, or mousetext characters. The program modifies your ImageWriter II or Epson FX, RX, or MX (with Graftrax Plus) driver, leaving the "custom printer" choice free for later use.

Installing ExtraWorks on your AppleWorks program disk is a little tricky. For one thing, it has to be the last modification you make. If you're going to add any macro programs, memory-expansion patches, or other enhancements (such as PathFinder), do it before you add ExtraWorks.

When you boot the ExtraWorks disk, the program asks for the location of your AppleWorks program disk. Specifying a ProDOS pathname seemed to work more smoothly, as the program crashed a couple of times when I chose a slot and drive number.

After you've entered the location of your program disk, your printer type, and whether you want slashed or unslashed zeros (in AppleWorks 2.0), you'll end up in a menu that modifies print commands. You can change the superscript, subscript, boldface, and underline commands to print as mousetext, half-height super- or subscripts, or text in yellow, magenta, cyan, orange, green, or purple. Of course, you can

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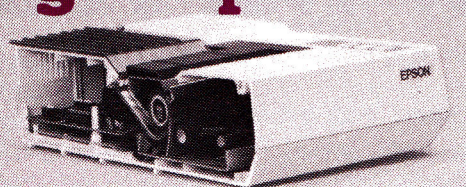

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also leave any printing commands unchanged if you prefer.

Once you've made your changes, the software prompts you to save the current setup or redo it. If you choose the latter, the program takes you all the way back to the point at which you indicated the location of your AppleWorks program disk. It would be more convenient if the program returned to the print menu, but starting over didn't take too much longer.

You can't change a command setup once you've saved it, presenting a more serious problem. If you want to redefine any print commands later, you must start with a clean copy of AppleWorks and go through the whole process again.

Once I'd completed the minor chore of installing ExtraWorks on my program disk, however, it worked fine. Printing with the newly customized commands is just as easy as printing with the originals from the Open apple-O options menu, and having a word or phrase appear in orange, cyan, or magenta here and there certainly brightens up a page of text.

The half-height superscripts and subscripts also worked well, but they're just that—half-height. If you're printing a big, single-spaced document, they're great space savers, but if you just need an occasional sub- or superscript, regular-size type is easier to read.

Author Eugene Whitehouse also includes three "freebies" on the ExtraWorks disk. The first lets you have more than one set of three printers if you're running AppleWorks from a 3½-inch or hard disk; the second is a word-processor file that describes printing two-line headers in AppleWorks. Freebie number three, which you can use only if you have Applied Engineering's TransWarp card, lets you rename Applesoft BASIC commands.

DIRECTORIES MADE EASY

If you have piles of files stored haphazardly on a ProDOS 3½-inch or hard disk, arranging them into subdirectories will help you sort them out. Arranging files in directories and retrieving them afterward can be as frustrating as searching through them in the first place, though. With PathFinder, using subdirectories (and a few other things) becomes easier.

Installing PathFinder is a breeze. Boot up the disk; the software prompts you to insert your AppleWorks program disk. In a matter of seconds you're ready to roll. AppleWorks looks the same as ever, except for option 5 on the Other Activities menu: It's now the PathFinder menu instead of "format a blank disk." (No great loss—just have a few formatted 5¼-inch disks handy if you think you're going to need them.) From there, you'll be able to add or drop a subdirectory or rename, lock, or unlock files.

PathFinder's AppleWorks-style menus make adding or dropping a subdirectory as simple as loading a disk file. Choosing "add a subdirectory" brings a list of directories on the current drive; pick the one you want and you're there. "Drop a subdirectory" works instantly—you're returned to the top of the PathFinder menu to add a different subdirectory or work with different files. Navigating paths

continued on p. 125

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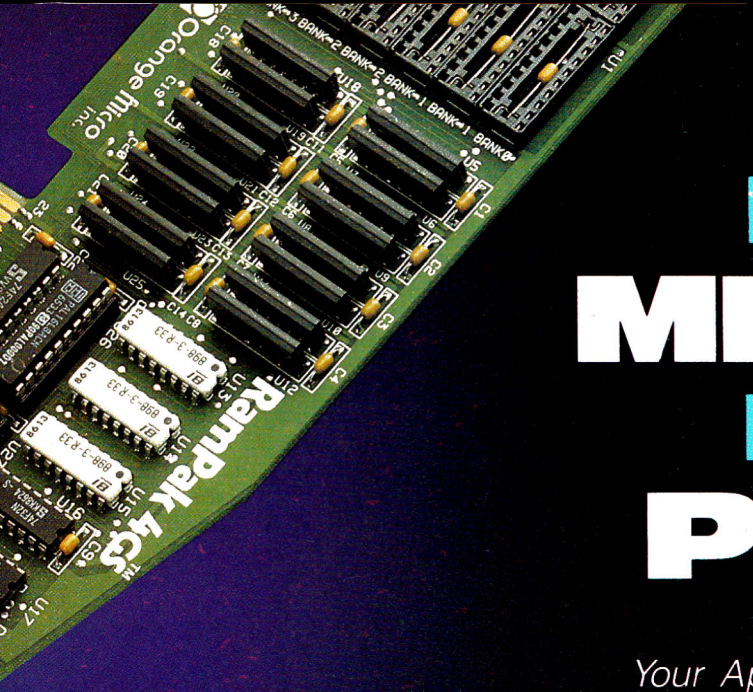


MORE MEMORY MORE POWER

Your Apple IIGS comes with 256K of memory—but all the really interesting software for the GS requires at least 512K. Don't despair—boost your memory with one of the RAM-expansion boards outlined here.

by Paul Statt, Technical Editor



You need extra memory in your Apple IIGS. That may shock proud GS owners who were weaned on 128K Apple IIs boasting 64K of "extended" memory—but the "standard" 256K Apple IIGS simply can't run many "standard" GS programs—for instance, music and painting software. (See **Table 1** for a list of the memory requirements of a sampling of GS products.)

If your GS is in *emulation mode*—that is, if its 65816 microprocessor chip is imitating IIe or IIc operation—256K is more than enough. Apple II programs, written for the IIe and IIc 8-bit 6502 microprocessor, can use only 64K of random-access memory (RAM) at a time; bank switching, however (switching at high speed among banks of 64K each), lets your Apple IIe or IIc address more. (See "Two Roads to Memory Expansion" and "Bank-Switched Memory," August 1986, pp. 46–51, for more information on this technique of memory management. See the accompanying sidebar, "Memory Addressing," for a brief rundown on bits and bytes.)

When you run older Apple II software on an unadorned GS, 192K (256 minus 64) remains after the program takes 64K. That's three 64K banks that AppleWorks, for instance, can use as a RAM disk (more on this type of storage in August 1986, p. 51).

But when the GS operates in 16-bit mode, using 24-bit addressing, you can access up to 16,777,216 bytes (2 to the 24th power), or 16 megabytes (16M, or around 16,000K) of RAM. That's more memory—much more—than the paltry 256K standard in your GS' RAM.

Software companies know it's theoretically possible to write a 16,000K program for the GS. While they haven't yet written any that big, almost all of the more interesting GS programs do use 512K or more. (See **Table 1**.)

Five hardware manufacturers offer you the extra memory you need to run spiffy graphics adventures and easy-to-understand desktop applications. Apple sells its **Memory Expansion Card**; Applied Engineering makes **GS-RAM** and **GS-RAM Plus**; MDIdeas markets a board called **OctoRAM**; Orange Micro makes **RAMPak 4GS**; and AST

Company	Product	Type of Product	Memory Requirement
Activision	Shanghai	graphics game	512K
	PaintWorks Plus	painting program	512K
	Music Studio	music program	512K
	Writer's Choice Elite	word processor	512K
Electronic Arts	Instant Music	music program	512K
	Deluxe Paint	painting program	768K
DataPak	Notes 'n' Files	database manager	512K
PBI Software	Visualizer	AppleWorks color graphics	512K
MDIdeas	SuperSonic	stereo card	1M

Table 1. Memory requirements of some typical GS products. A program requiring 512K of RAM needs a memory card with a minimum of 256K.

offers **RAMStakPlus**. (See the accompanying Product Information box for details of manufacturers' addresses; see **Table 2** for a summary of technical specifications and pricing.)

When third-party hardware manufacturers designed memory-expansion boards for the Apple IIe, some chose auxiliary-slot protocol and some used the older peripheral-slot standard. (See "Bank-Switched Memory," August 1986, p. 50.) Other than that, their boards are more or less alike. The differences lie in the software that makes the boards work with application programs, not in the type of memory chip used.

Memory expansion for the Apple IIGS is a different story. GS RAM cards fit neatly into the special memory-expansion slot on the machine's motherboard, and just as neatly into the GS' memory handling. The GS is built for memory expansion. And manufacturers have learned that to sell boards, they must make the differences among them clear to the customer.

HOW MUCH MEMORY?

Many GS RAM boards allow for memory expansion to at least 4 megabytes. To encourage third-party developers, Apple limited its own GS expansion board to a single megabyte: The choices are 256K, 512K, or 1 megabyte (1024K).

Memory is sold in chips, which vary in size. Some chips hold 256 kilobits (32K bytes); some carry 1024 kilobits (1 megabit, or 128K bytes), four times more. Since eight bits make a byte, you need eight 256-kilobit chips to get 256 kilobytes (or 256K) of memory.

Apple, for one, sells memory in packages of eight 256-kilobit chips each, yielding 256K of memory per set. (Remember that 256K, 512K, and 1024K, or 1 megabyte, are the only memory configurations possible on Apple's RAM board.)

Applied's GS-RAM is similar to Apple's memory board in using the smaller chips—but GS-RAM lets you add them one at a time, not in bunches of eight or 16. A megabyte and a half (48 256-kilobit chips) fits on the main Applied board, but a connector will let you add more on a *piggyback card* (a board that attaches to another without using an additional peripheral slot) when Applied releases that product.

These 256-kilobit RAM chips are inexpensive and easy to find. The thrifty owner of an old Apple II Memory Expansion Card, or any third-party IIe or IIc card, can simply pull the chips off the old one and fill up, or *populate*, the GS board.

Applied also offers **GS-RAM Plus**. It's the same physical size as the GS-RAM board and has as many sockets for memory chips, but it uses the larger 1-megabit chips to add up to 6 megabytes of RAM.

AST's RAMStakPlus uses 256-kilobit chips. AST recommends, as does Apple, that you use them to upgrade your GS to either 512K or 1 megabyte.

IN THE CHIPS

MDIdeas' OctoRAM offers, as the name implies, up to 8 megabytes of RAM. (A piggyback board, **OctoRAM ESP**, adds up to another 512K.) To get those 8 megabytes, you need to use eight 1-megabyte modules—not the standard chips installed in the GS or found on older IIe and IIc cards.

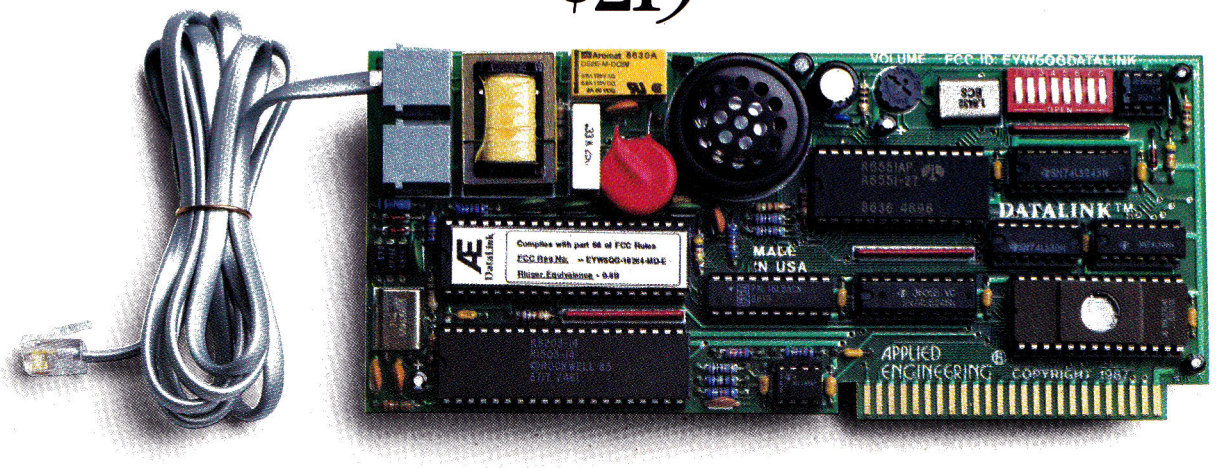
OctoRAM's designers figured that if eight 256-kilobit chips add up to 256K of memory, 32 of these smaller chips make a megabyte; you'll need 256 of the little chips for an 8-megabyte board. But 256 chips is quite a crowd on a single circuit board, so the MDIdeas engineers decided to use *single in-line memory modules* (SIMMs), which come in both 256K and 1-megabyte versions.

The advantage is that eight SIMMs fit neatly on a board; the disadvantage is that the 256-kilobit RAM chips from your old IIe are worthless. You may also have some trouble finding SIMMs—they're not as common as RAM chips, and currently not as cheap. (If price is important to

Company	Product	Minimum Configuration	Price	Maximum Configuration	Price	Chips	Software	Warranty	Add-Ons
Apple	Memory Expansion	256K	$129	IM	$336	256-kilobit	none	90 days	none
AST	RAMStakPlus	256K	$129	IM	$516	256-kilobit	optional ROM software	2 years	EPROMs, EEPROMs
Orange Micro	RAMPak 4GS	512K	$189	4M	$875	1-megabit	caching	1 year	none
Applied Engineering	GS-RAM	256K	$169	1.5M	$379	256-kilobit	AppleWorks memory expansion caching (fall)	5 years	piggyback (fall)
	GS-RAM Plus	IM	$459	6M	$1959	1-megabit	AppleWorks memory expansion caching (fall)	5 years	piggyback (fall)
MDIdeas	OctoRAM	256K	$149.95	8M	$2850	256K SIMM IM SIMM	none	1 year	ESP (see below)
	OctoRAM ESP	128K	$179.95	512K	$389.95	256-kilobit	ROM software	1 year	not applicable

Table 2. Technical specifications of six GS memory cards compared.

Global communications. Down-to-earth price. $219



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Now you can tap into a world of information — without draining your resources. Our Datalink™ modem lets your Apple IIGS, IIe or II+ communicate with other computers, download free software from networks and bulletin boards, access database services and more. For a remarkably low price.

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There's nothing missing on Datalink.

Unlike the Smartmodem,® Datalink comes with its own easy-to-use communications software in ROM and on disk that supports macros, file transfers, on-line time display, data capture and datascope mode. The software also allows you to store hundreds of phone numbers for auto dialing and log on.

Because Datalink is 100% Super Serial Card compatible, you can also run virtually all other communication software, including Point-to-Point, Apple Access and ASCII Express, to name a few.

The compact design allows Datalink to fit in any slot — including slots 1 and 2 of the IIGS with a cooling fan installed. Datalink operates at 1200 or 300 baud. Built-in diagnostics check for accuracy of data transmission, and Datalink lets you track the progress of calls either electronically or via an on-board speaker.

Introductory offers from popular networks included.

When you purchase Datalink, you'll get a fee-waived membership to The Source worth $49.95. $60.00 worth of free on-line time from News Net. A free $50.00 subscription to the Official Airline Guide. A free subscription to the GEnie network worth $18.00! And information on MCI Mail.

	Applied Engineering Datalink	Hayes® Smartmodem 1200A
Price	$219	$439
Max. transmission rate	1200 baud	1200 baud
Warranty period	5 years at no charge	2 years or 4 years for $75
Software included	YES	NO
Hayes AT command set	YES	YES
Help screens	YES	NO
On-board telephone jacks	YES	NO
Fits any slot (even with fan)	YES	NO

Smartmodem is a registered trademark of D.C. Hayes Corporation.

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you, call the RAM-card manufacturers listed here before you buy; at press time—late June—memory-board makers warned that changes in tariffs on Japanese imports could affect prices at any time.)

Orange Micro went a third route with its RAMPak 4GS, using the larger of the two chip sizes described above. On the RAMPak 4GS card, they're also known as *256 x 4 dynamic random-access-memory* chips, or DRAM. DRAM differs from standard RAM in that to prevent loss of information, your computer must continually *refresh* the data stored there—renew the electric charge to the memory cells.

Each RAMPak DRAM chip is four times the size of the smaller chip—1024 kilobits (128K bytes), four times the 256 kilobits in a standard chip. That makes it easier to add memory—but, again, you'll probably have to buy the chips from Orange Micro. RAMPak 4GS offers a standard 512K, expandable to 4 megabytes in increments of 256K per package. Each chip on the RAMPak 4GS card holds 128K of memory; you can install as many as 14 kits, containing two chips, or 256K, each, to bring your board up to its full population of 4 megabytes.

JUMP RIGHT IN

DRAM chips and plain 256-kilobit chips are easy to install. If you can change the oil in your car, you can probably put a memory chip in place.

OctoRAM's SIMMs chips are a little more work; you'll have to spend some time preparing the board. A more serious complaint with OctoRAM installation is that its piggyback connector points in the wrong direction—to the left, toward the GS' slot 7, which the expansion board covers completely. That defeats the purpose of using a piggyback card.

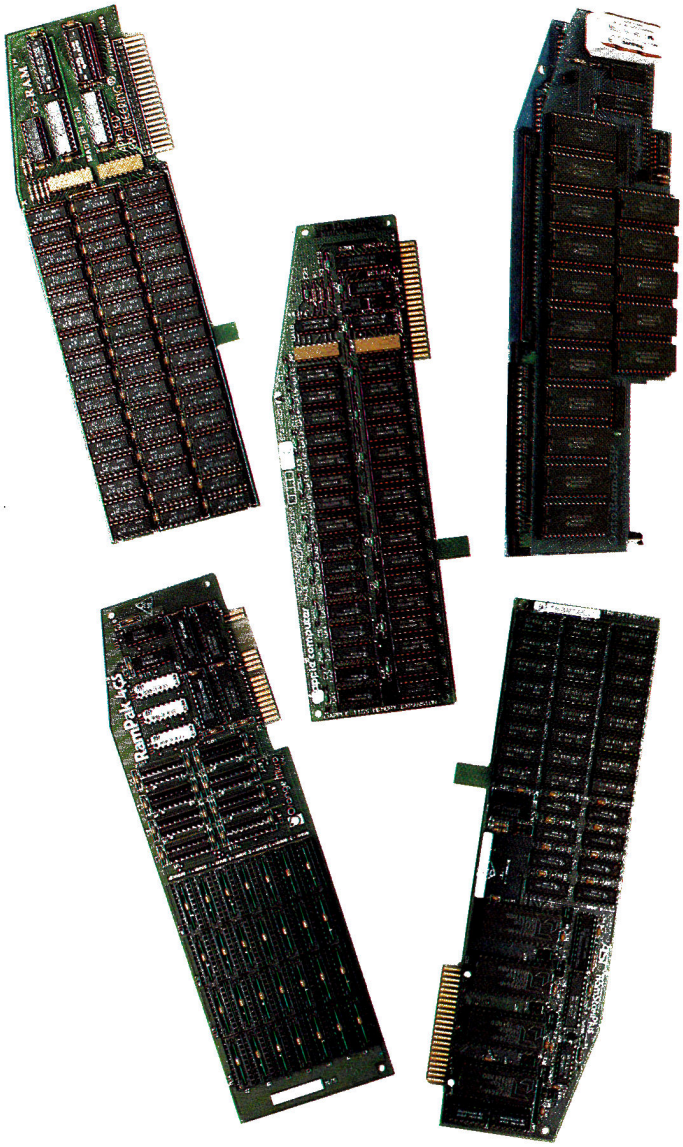
The Apple and AST boards add an extra step to the simple installation process. Instead of merely inserting the board into the slot, you have to either add or remove a couple of small "jumpers"—tiny plastic blocks you push down over vertical pins you'll see sticking up from the RAM board. It's easier—and safer—than jump-starting a car, but it adds a couple of seconds to the minute or two you'll spend installing the card. Jumpers prevent you from using odd memory configurations, such as 768K or 384K. Stick to 256K, 512K, or a megabyte with whatever card you use. ProDOS may trash your RAM disk or refuse to load it if it encounters an odd memory size.

ROM AND PERMANENT RAM

Now that you've installed all that extra memory, what are you going to do with it? You may want to set up a *RAM disk*—set aside your extra RAM to be used as a "phantom" drive to store data files or programs. It will look like a physical drive to ProDOS, but the fact that it's actually RAM and not a disk makes two things different: File-access time is faster; and storage is *volatile*, or temporary, lasting only as long as your Apple's power is on. (See "RAM-Disk Storage," August 1986, p. 51, and "Pumping Up the IIe," May 1987, p. 44.)

OctoRAM ESP's extra memory adds *battery-backed RAM* to the main board. A battery-backed RAM disk is a completely different way to store information and programs, because you don't lose its contents when you turn the power off. The memory is nonvolatile, or permanent; the GS Memory Manager can treat ESP's bytes as a *ROM disk* (read-only memory).

When you install programs in ROM, they stay there. For example, you can put AppleWorks on the ROM disk, make the ROM your start-up disk, and have AppleWorks' main menu on screen in less than five seconds.



Top, left to right: Applied's GS-RAM, Apple's Memory Expansion Card, OctoRAM from MDIdeas. Bottom, left to right: RAMPAK 4GS and AST's RAMStakPlus.

Product Information

GS-RAM
GS-RAM Plus
Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 241-6060
Reader Service Number 321

Memory Expansion Card
Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
Reader Service Number 322

OctoRAM
OctoRAM ESP
MDIdeas, Inc.
1163 Triton Drive
Foster City, CA 94404
(415) 573-0580
Reader Service Number 323

RAMPak 4GS
Orange Micro
1400 North Lakeview Ave.
Anaheim, CA 92807
(714) 779-2772
Reader Service Number 324

RAMStakPlus
AST Research
Attn: Apple Products
2121 Alton Avenue
Irvine, CA 92714
(714) 553-0340
Reader Service Number 325

AST uses a simpler route to ROM disks. RAMStakPlus has four ROM slots—no piggybacking. You can plug in either *erasable programmable read-only-memory* chips (EPROMs) or *electronically erasable programmable ROM* chips (EEPROMS). If you want to use an EPROM, you need special hardware, an EPROM programmer, to etch your program or data into the chip permanently.

The EEPROM's advantage is that you can program it with special software AST supplies with the chips, and you can erase it and change it yourself. You can configure easily both AST's EEPROMs and the MDIdeas OctoRAM ESP ROM disk; AST's is the more elegant solution, though, with space for ROM as well as RAM chips on the memory board, and no piggyback.

OctoRAM ESP and RAMStakPlus make the GS Desktop work the way it was intended to work. Use it as you would the Macintosh Finder: It's there when you turn the machine on and whenever you quit an application.

CACHE AS CACHE CAN

If you want to work faster, you may find that Orange Micro's RAMPak 4GS *caching* software does the trick better than an extra megabyte or two, and costs less. A *disk cache* is an area of RAM where special software stashes any program or data you access often from disk.

A typical example is AppleWorks' set of printing routines, which are always stored on disk, even after the rest of AppleWorks loads into RAM. Orange Micro's caching software stores printing routines in a RAM cache the first time you use them. As long as you continue to access them, you get them fast from RAM, not disk. Caching can help if you find your disk drives' spinning is slowing you down.

The latest word from Applied is that the next versions of GS-RAM and GS-RAM Plus will offer caching software, too, as well as a battery-backed piggyback board that will attach to either card. GS-RAM and GS-RAM Plus also currently include AppleWorks expansion software—a widely known feature of Applied Engineering memory cards—which increases the size of word-processing files to 20,600 lines and databases to 20,600 records.

A MEGABYTE IS ENOUGH

You probably don't need 8 megabytes of memory, but your GS does deserve 1. If you have an old memory card lying around, Apple's, Applied's, and AST's GS boards are the best bets because they use the same chips.

If you need 1.5 megabytes and want to add ROM later, or if you're passionate about AppleWorks, go with Applied Engineering. If you want a ROM disk right now, MDIdeas' OctoRAM with ESP can give it to you, but AST's RAMStakPlus does it better. To speed up disk work and run big programs, the choice is Orange Micro's RAMPak 4GS, with its sophisticated caching software.

There comes a point in computer design when memory is too big—it depends on the ratio between processor speed and memory size. Eight megabytes of memory—more than 67 million bits—in a machine with a speed of 2.8 million instructions per second approaches the limit of efficiency. (The 65816 microprocessor would require some 27 seconds just to glance at all those bits.) Unless you plan to run multiple programs, you probably don't need 8 megabytes of memory; you certainly need 1, however, to get maximum power from your GS.■

Memory Addressing

No matter how powerful your computer's microprocessor is, it can't function without memory to store the data and program instructions that tell it what to do—and memory in turn depends on patterns of electrical current.

Minute switches control the flow of electrons into and out of storage areas, called *memory cells*, along wireless paths embedded in the silicon innards of your Apple's motherboard. At any given moment, a cell can assume one of two electrical states: charged or discharged (on or off), which we can express as one or zero, called a bit (a binary, or base 2, digit).

The pattern formed by the electrical states of adjacent cells is the basis of the language your Apple uses internally, the American Standard Code for Information Interchange (ASCII). Decimal digits, lowercase and uppercase letters, a number of instructions, and several symbols and punctuation marks are identified by various 8-bit sequences called *bytes*. (A, for example, is 01000001.) Eight places yield 256 (two to the eighth power) possible combinations of ones and zeros, from 00000000 to 11111111.

Each byte can be transferred to other areas of your Apple, such as the microprocessor or an output port, when called upon. The IIe and IIc are said to be 8-bit computers because the 6502 chip contains 8-bit-wide *registers*, or storage areas, where data are held for processing. Your GS is a 16-bit machine because its registers are 2 bytes wide.

Each *memory location*, or byte, in RAM is assigned its own binary identification number (different from any datum or instruction stored there), called its *address*. Each location must have a unique binary ID to distinguish it from all others in the machine. The greater the number of bits your computer permits in an address, the greater the number of unique binary patterns, and therefore memory locations, possible.

When you type data and programs into your Apple, they remain in memory until you issue a command, such as RUN, to the microprocessor. To retrieve an instruction or piece of data from memory, the microprocessor transmits the address of the location of that item to RAM over an electronic path, the *address bus*. Data travel back to the microprocessor from memory over the *data bus*.

The *addressable memory* of a microprocessor, the number of different RAM locations it can distinguish, is calculated as 2 to the *n*th power, where *n* is the width of the address bus—the number of bits the microprocessor can transmit at a time. Your IIe's or IIc's 6502 microprocessor has a 16-bit address bus; it can access 2^{16}, or 65,536 memory locations (64K bytes) at a time. Your GS' 65816 chip has a 24-bit address bus, and can access 2^{24} locations, or about 16,000K (16 megabytes).□

Æ Update . . .

AE's IIc System Clock now includes AppleWorks 2.0 support for time and date screen display and file stamping. This latest update now supports all versions of AppleWorks from 1.0 to 2.0. Using the IIc System Clock's pass-through serial port, the IIc clock can plug into either of the Apple IIc's built-in modem or printer ports. Then, the modem or printer can plug directly into the IIc System Clock. Three "AA" batteries keep the correct time for up to 2 years before simple replacement is necessary. Current IIc System Clock owners can upgrade to the new IIc System Clock Utilities, version 3.0.2 for $10.00.

ColorLink, a new version of the RamWorks RGB option, is now shipping. ColorLink allows connection of an IBM 9-pin RGB monitor or the new Apple IIGS analog color RGB monitor to the Apple IIe. AE's previous version, called Digital Prism, supported the discontinued Apple Color 100 RGB monitor. ColorLink has the same $129.00 retail price and allows the user a choice of viewing either white, blue, green or amber text. Digital Prism will still be available for Apple Color 100 monitor owners. Feel free to call Applied Engineering for advice on RGB monitors you can use with your system.

Parallel Pro will soon be shipping from Applied Engineering. Parallel Pro is an intelligent parallel printer interface card designed for the Apple II Plus, IIe and IIGS. Powerful features like Apple IIGS super high resolution graphics, mixed text and graphics, as well as screen dumps are fully supported by Parallel Pro. An optional 8K to 256K buffer card that plugs directly into Parallel Pro will also be available. The optional buffer card can accept standard 64K or 256K chips in any combination up to 256K total. In fact, the 64K or 256K chips can be recognized by the optional buffer card individually or in a set of 8. (256K of buffer memory is equivalent to approximately 250 typewritten pages of text.)

AE's 16K Pocket Rocket is available to Apple II Plus owners to expand a 48K machine to 64K of memory. The original 16K card had a chip count of 22. The new Pocket Rocket (it fits in a shirt pocket) has a chip count of only 4. The 16K Pocket Rocket has the Applied Engineering no hassle 5 year warranty. Applied Engineering continues to provide new product support and innovative developments for Apple II Plus computers.

Applied Engineering is shipping the new 2 MEG Plus for expanding RamWorks II and RamWorks III boards up to 3 Megabytes of memory. The 2 MEG Plus piggyback uses standard 1 MEG DRAMS and is expandable to 2 MEG. With 1 MEG installed, the 2 MEG Plus retails for $499.00. Fully populated with 2 MEG, it sells for $799.00.

Applied Engineering is seeking an experienced 6502 machine language programmer to develop software and firmware for its expanding line of Apple peripherals. Minimum 2 years of Apple programming experience required. Send your resume to Applied Engineering, P.O. Box 798, Carrollton, TX 75006, Attention Personnel.

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GO BEYOND
The IIc's Limit

Who says you can't beef up your IIc? inCider *presents a rundown on RAM cards that will help you get the most from your machine.*

by Paul Statt, Technical Editor

The Apple IIc is a closed box—Apple designed it to be a computer you'd never need to expand. In 1984 the brand-new IIc boasted 128 kilobytes of random-access memory (RAM), twice the memory of the 64K Apple IIe; an 80-column display, still not standard on the IIe; two built-in serial ports, enough for a modem and a printer; and an extra video-display output, in case you'd ever need a second monitor.

So what's missing? Why expand the IIc?

THE CASE FOR RAM

The IIc's 128K of RAM seemed like a lot in 1984. In fact, even now no program written for the IIc needs more than 128K of RAM—but many can use it.

AppleWorks is the best example. This integrated spreadsheet, database manager, and word processor is a big program—it uses 130K of memory. The trick that lets such software run on a 128K computer is to keep most of the program on a floppy disk. Only the portion of AppleWorks you need right now stays in your Apple's RAM.

But you can fool AppleWorks into believing it's running on a bigger machine. The answer lies in installing more RAM and using it instead of a disk drive to hold the entire AppleWorks program. The extra RAM pretends to be a disk drive; and, in fact, the program loads itself in pieces from "disk" just as it did before RAM expansion, only faster. A RAM "disk" is faster than a physical disk.

NO ONE SAID IT'D BE EASY

It's no simple matter to add memory to the IIc. Apple designed it precisely for people who don't like to open their appliances. The latest IIc model, which you'll recognize by its platinum-colored keyboard (the original IIc was beige) has a built-in slot for memory expansion. But opening up a IIc is a frightening job that many will want to leave to the guys at the local computer shop.

A good computer technician won't charge much for installing a memory-expansion card. If you buy the board in a store, installation should be free. If you decide to try it yourself, though, you shouldn't have too much trouble prying the lid off either the old or the new IIc. A little twist with a screwdriver on the keyboard end, in the middle around the spacebar, will pop the top right off.

Once you're inside, take a look around. First take off the keyboard. You'll find that it's attached to the motherboard by a ribbon cable, which you can remove to get the keyboard out of the way. If you're really curious about the IIc motherboard, lift the disk drive out and remove the ribbon cable. It's unlikely that you'll break anything, but make sure you discharge any static electricity from your

body before opening the computer: Just touch the power-supply box first.

WHAT'S AVAILABLE?

Applied Engineering, Checkmate Technology, and Apple Computer manufacture RAM add-ins for the Apple IIc. Apple offers the **IIc Memory Expansion Card**, a single, 1-megabyte (1024K) board that fits only newer (platinum) IIcs; Applied markets two sizes of its **Z-RAM Ultra** board—**Ultra 1**, which expands to 512K, and **Ultra 2** (with clock) and **3** (with clock and Z-80 chip), which expand the IIc up to 1.5 megabytes; Checkmate's **MultiRAM CX** expands your IIc to 512K. If you want a megabyte, Checkmate offers a companion, or "piggyback," board, the **MultiRAM CX Plus**, which can expand your memory to as much as 1152K.

Apple's board is easiest to install, but ironically Apple doesn't suggest you do it yourself. It's an easy job for an Apple dealer or authorized technician, because, as noted above, Apple designed the newer IIcs with an internal memory-expansion slot. The card fits right in.

In older IIcs, which you can expand only with Applied or Checkmate boards, you'll have to remove a couple of the more important chips from your IIc motherboard: the MMU (main memory unit) and the CPU (central processing unit). The CPU is the 65C02 microprocessor, the power behind the IIc; the MMU acts as a sort of "fuel tank" and sits right next to the CPU. They're clearly labeled in the IIc.

Your job is to remove the MMU and CPU with a chip puller or small screwdriver—the latter works better—and install them in their proper places, clearly marked, on the memory-expansion board. Then plug the entire RAM card, with its CPU, MMU, and a number of 256-kilobit RAM chips, back into the the empty holes you left in the motherboard after removing the CPU and MMU. (See the accompanying **Figure**.)

Older IIcs weren't meant to hold an extra layer of card, so you'll also have to add some supports to keep the memory-expansion board from falling into the motherboard, and keep the keyboard from touching the card.

Even Applied's largest board, the Z-RAM Ultra 3 with a megabyte of memory, Z-80 CP/M coprocessor, and a ProDOS clock built in, plugs in this way—you just need to use more supports. If you install Checkmate's CX Plus piggyback on top of the MultiRAM CX board, you'll need to remove a few more chips and attach "jumper cables" between the boards, too.

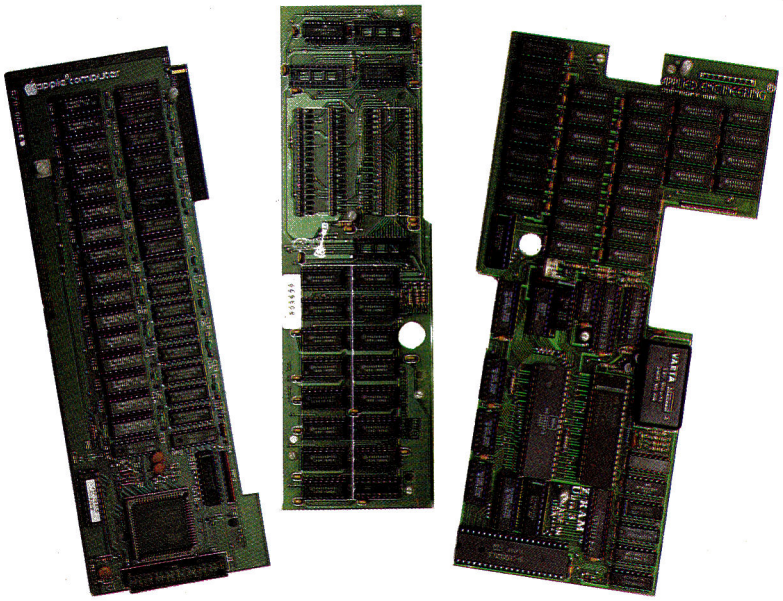
Both Checkmate's and Applied's boards work equally well in the platinum IIc; just remember that Apple made its newest IIcs easier to expand, not easier to open. It's still a bit of work to get the cover off. If you're reluctant to tackle the job yourself, both Applied and Checkmate will try to find you a technician to install your boards if you're a legitimate owner of their products.

NOW WHAT?

Adding extra memory to a computer designed for 128K programs is a bit like adding stereo speakers to an old Victrola: You've added power, but how do you use it? IIc software just can't use any more memory than 128K.

The exception is AppleWorks. Apple has rewritten AppleWorks so that it grabs any extra memory on the Apple memory-expansion card; Applied and Checkmate can retrain AppleWorks to recognize the Z-RAM Ultra or MultiRAM CX cards, respectively. If you have Checkmate's board, you need Checkmate's AppleWorks Expansion software; if you buy Applied, you need Applied's software. If you use the Apple board, all you need is AppleWorks, version 1.3 or higher.

The major purpose of such expansion software is to load all of AppleWorks into memory before you start using it, whether you've got the Apple card, Applied's, or Checkmate's. The differences are subtle, but significant.



Left to right, above: Apple IIc Memory Expansion Card, Checkmate MultiRAM CX, and Applied's Z-RAM Ultra.

AppleWorks automatically loads itself to the Apple RAM card. You have little control over this process, which adds a minute or two to your AppleWorks start-up time.

Applied Engineering lets you decide whether you want to autoload AppleWorks into memory. You can also choose to use some of your extra RAM as a *printer buffer*, an area of memory that holds your data and feeds them to your printer piece by piece as it's ready to accept them. That lets you work on one documemt while printing another.

Applied's Desktop Expansion software also increases the memory available for documents on your desktop from 55K to a maximum of 727K. It still handles only 12 documents, but each can be much larger than usual: more records in each database file (15,200), more lines in your word-processor document (15,200), and more items in each spreadsheet (difficult to measure precisely, because

Product Information

Apple IIc Memory Expansion Card
Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
$269

Reader Service Number 332

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$229.95 (512K)
MultiRAM CX Plus,
$244.95 (512K)
Checkmate Technology
509 South Rockford Drive
Tempe, AZ 85281
(602) 966-5802

Reader Service Number 333

Z-RAM Ultra 1,
$199 (256K)
$249 (512K)
Ultra 2,
$269 (256K)–$399 (1M)
Ultra 3,
$329 (256K)–$459 (1M)
Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 241-6060

Reader Service Number 334

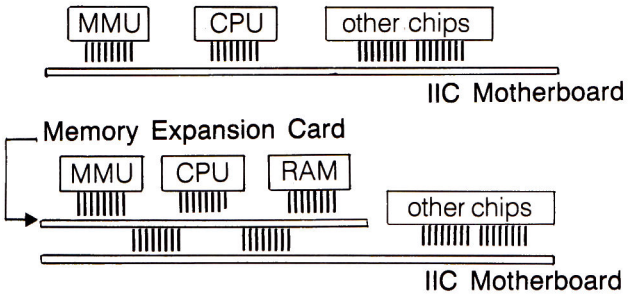

Figure. Remove the main-memory and central-processing units from the IIc's motherboard, plug them into your Applied or Checkmate RAM card, then fit the RAM card into the vacant MMU and CPU slots on the motherboard.

of the varying complexities of individual spreadsheets).

Checkmate offers similar features with one advantage. If you sometimes use only part of AppleWorks, you can choose, as you start up, to load only as much of the program as you need—spreadsheet, database, or word processor. Checkmate's software also lets you load printer information into RAM—a feature not found on Applied's board.

RAM DISK OR NOT?

Not every AppleWorks user wants to use all his or her machine's extra RAM for AppleWorks. You may want to use part of it as a RAM disk, especially if you perform operations that call for transferring files to disk, then loading them back into another part of the program.

Both Applied and Checkmate offer partitioning software that makes it simple to divide your RAM into AppleWorks and RAM-disk portions. If you want to use a RAM disk, steer clear of Apple's card. Apple supplies no partitioning software, and it's no easy job to split up RAM with the ProDOS filer.

Applied and Checkmate support the Pascal and DOS 3.3 operating systems as well as ProDOS. Applied's Z-80 option lets you use CP/M with your extra memory, too.

Checkmate also offers an optional 16-bit 65816 microprocessor, which won't affect any programs you run on the IIc, except VIP Professional, unless you write your own in 65816 assembler code. If you want the power of 16-bit programs, buy a IIGS.

PROGRAMMERS AND POETS

It's ironic that you'll find the best explanations of extra memory and how it works in the Checkmate and Applied Engineering manuals: While the competition between these two companies has driven each to supply more and better information than its competitor, Apple publishes no documentation. For this reason alone, Applied and Checkmate boards are better suited for people who are curious about how to write programs that use extra RAM. These manuals present in detail all the memory-management information you'll need—soft switches for selecting memory banks, memory mapping, reset and interrupt handling.

Applied's Z-RAM has a slight edge over Checkmate's MultiRAM CX for programmers, while Checkmate's MultiRAM software manual is a good place for beginners to learn how to use all that memory. Applied's manual contains the same information—it's just harder to pull out.

TAKE A LOOK AT MEMORY EXPANSION

While Apple designed the IIc as a "closed box," programs like AppleWorks—programs that work most efficiently with more than 128K—make memory expansion attractive. It requires a little bit of work, or a trip to your dealer; but if you want AppleWorks to do more and do it faster, extra RAM may be the answer.■

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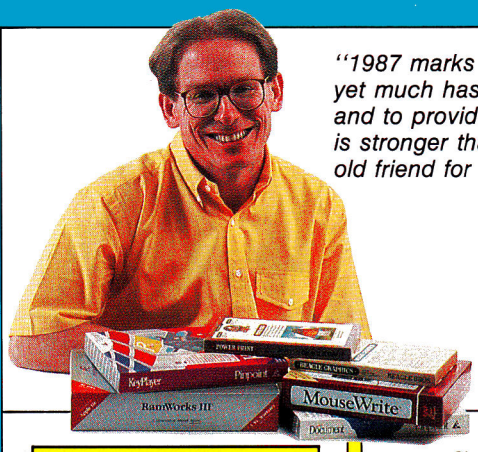

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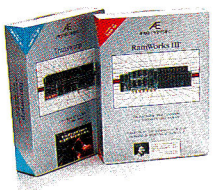

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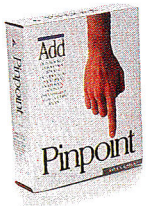

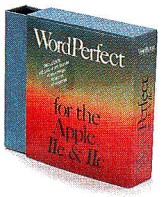

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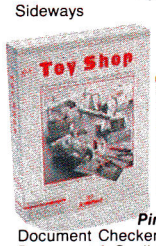



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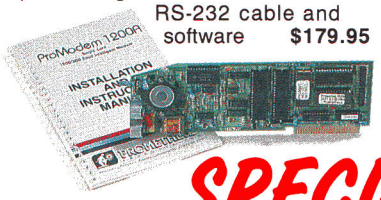

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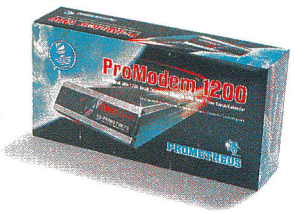

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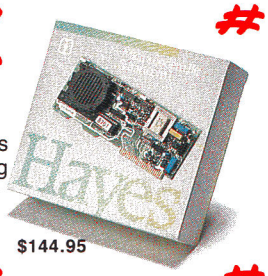

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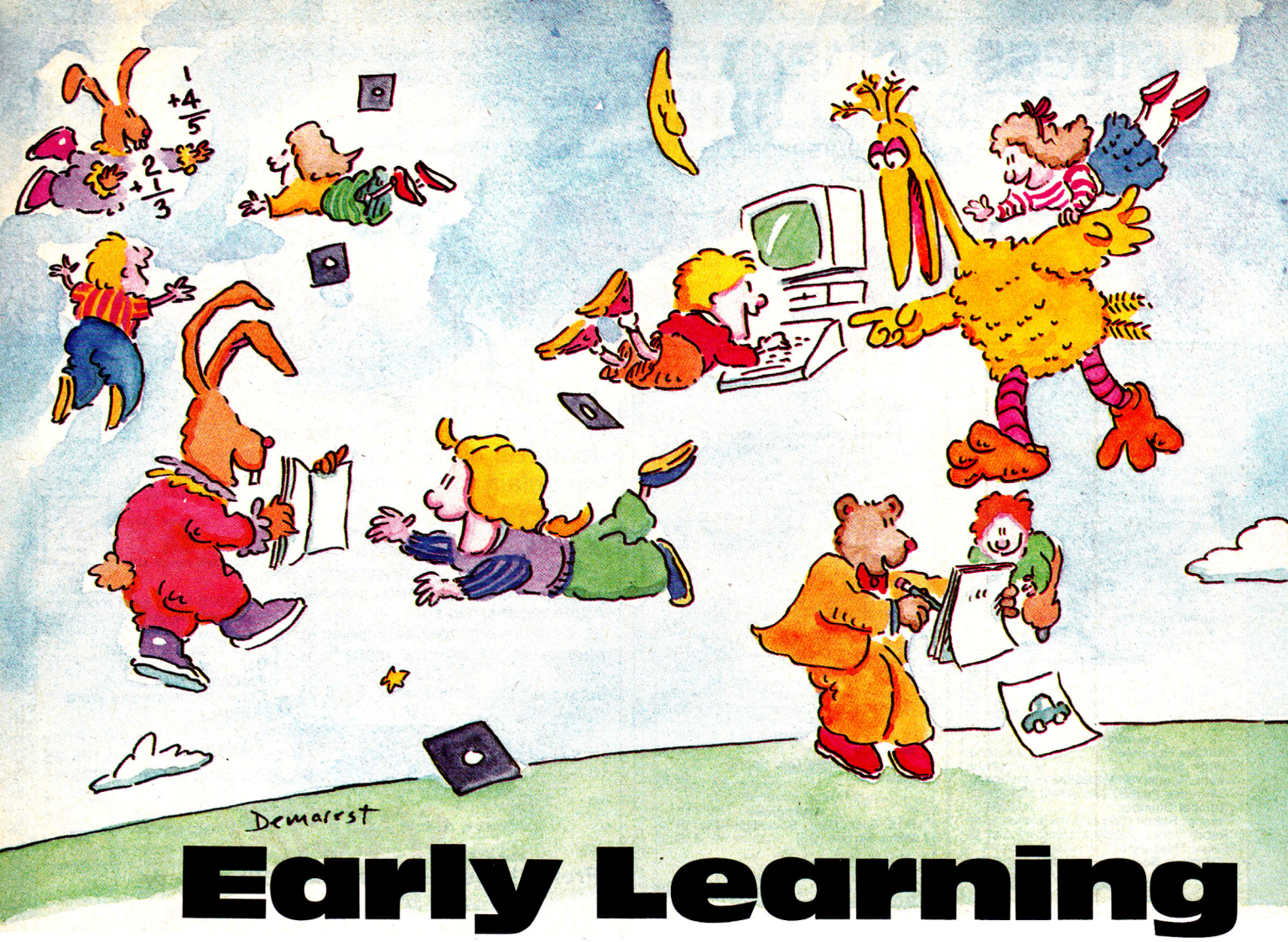


Early Learning

Can your Apple II help your youngster prepare for school? inCider *surveys a range of early-childhood programs that make learning fun.*

What's more natural than a child's curiosity? With a little initial help from mom and dad, your Apple II can encourage your preschooler to explore letters, numbers, shapes, and colors. There's a lot of software from which to choose, too: Publishers are expanding their lines of early-learning programs, designed to educate and entertain youngsters aged 2–6. Some teach the basics—the ABCs and 123s children need to know before they can move on to the Three Rs—while others help kids enhance their computer literacy or early critical-thinking skills.

HOW DO PROGRAMS TEACH?

Effective early-learning programs have a number of characteristics in common. First and foremost, all worthwhile programs in this genre are entertaining. They have to be—they're competing with television and videos. To attract the child's attention, these programs exploit the best the Apple II can offer: colorful graphics, animation, and sound.

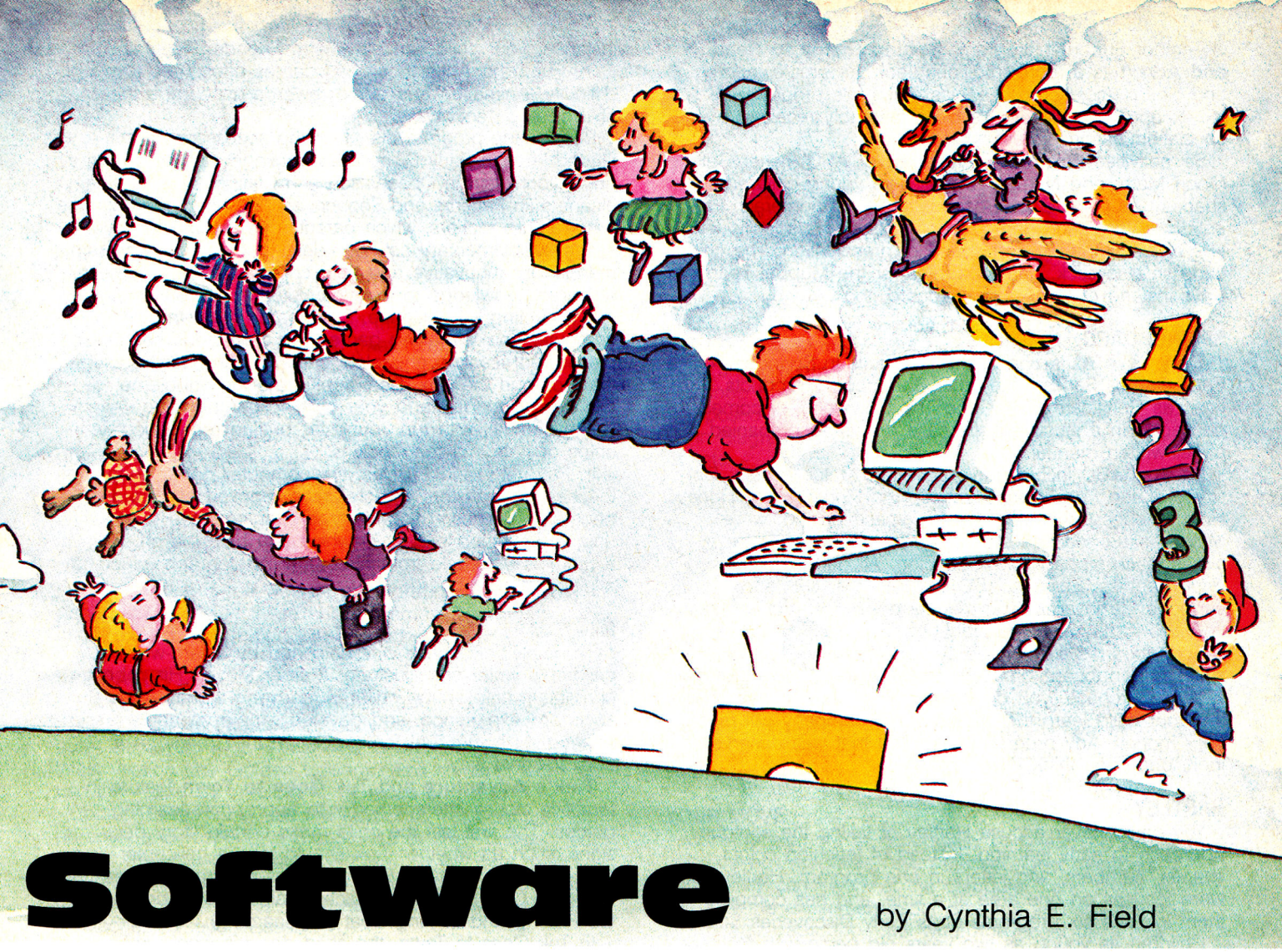
You don't have a GS? Don't fret—few of the programs available today require that model. In fact, among the 14 programs highlighted in this article, not a single one requires more than 64K.

About the only hardware expense you may have to absorb is the purchase of a color monitor; nearly all early-education programs work best with color. You don't need an RGB, though—a composite color model (even a portable color TV) will do.

It's true that the Apple II, II Plus, IIe, and IIc hardly ever brag about their musical ability, but early-learning software features only standard beeps and buzzes and simple music. Most kids I know prefer *Pop! Goes the Weasel* and *Old MacDonald Had a Farm* to Bach's *Brandenburg Concerti*, anyway.

Another nice feature you find in early-learning software is the option of using alternative input devices. A majority of programs require only the standard Apple II keyboard. Some support the joystick, mouse, or both. Others support child-styled input devices, such as Personal Touch's **TouchWindow** (reviewed in March 1986, p. 66), a pressure-sensitive screen that fits over your monitor, and Sunburst's (originally Koala Technologies') **Muppet Learning Keys** (reviewed in April 1985, p. 98), a specially constructed children's keyboard. It's big and lightweight—and seems impervious to peanut butter and jelly. If your child can maneuver the ordinary Apple II keyboard, fine. If not, you might consider software that supports other devices that can foster hand-eye coordination and other motor skills without frustrating the child.

Early-learning programs usually feature popular heroes and familiar objects. Some programs are built around farm animals or wild animals. Some animals become "real peo-



Software

by Cynthia E. Field

ple," such as Mindplay's Cotton Tales or The Learning Company's Gertrude the Go-Getter Goose. Other programs highlight the Peanuts gang (Random House), the *Sesame Street* crowd (CBS/Mindscape), the Mickey Mouse club (Sierra On-Line), or the Muppets (Sunburst and Simon & Schuster). Some companies have created their own new characters—such as Mindscape's TinkTonks.

Like good software designed for any age level, early-learning programs neither belittle the child nor stunt his or her natural curiosity.

Children, like adults, make mistakes when using software. Most programs respond to minor errors, such as stray keypresses, by ignoring them or by gently beeping. If the program is looking for specific responses, hints and extra tries are usually available.

Most early-learning programs offer variable levels of difficulty, sometimes with utilities that let parents fine-tune the software. Not only can you tailor the program to your youngster's level, but you can get double or even triple duty from a program if you have more than one child in the age range suggested for the program.

In terms of your computing budget, most early-learning programs won't force you into bankruptcy: Most are priced somewhere in the $30–$40 range.

SELECTED PROGRAMS

Writing about every early-learning program currently available would take up a book. Let's look instead at seven publishers and 14 of their best products. See the accompanying Product Information box for addresses and prices, along with a list of other noteworthy publishers of software for young children. Consider calling or writing each of these companies for a catalogue for your home-software reference file.

SUNBURST COMMUNICATIONS

Programs from this well-regarded educational-software publisher are somewhat more expensive than most others. Don't let the prices turn you off, though—Sunburst publishes some of the best programs I've seen. Free backups, a lifetime warranty, and toll-free support add value to each Sunburst package.

Designed by professional educators, most Sunburst programs are intended primarily for school use, creating a hidden bonus for parents. Each Sunburst program includes lesson plans and supplementary activities astute parents can use to guide their children's progress at home.

One of my favorites is **Muppetville: Identifying and Classifying Shapes, Colors, and Numbers**. This program features Kermit and the Muppets in six "matching" activities, styled after the popular game Concentration. Children learn to identify shapes and colors, match numbers with spots on dice, and perform simple addition.

The Muppetville manual provides supplementary activities and worksheets—such as drawing your own "shape beasts." Parents can select among variable levels of difficulty and focus. Muppetville supports the TouchWindow and the Muppet Learning Keys as well as the standard Apple II keyboard. The program also runs on the GS; the manual lists control-panel settings.

Another Sunburst program, **Getting Ready to Read and Add**, has a more traditional look. Its simple menu and clean, uncluttered graphics make this program ideal for exceptional children; it's been favorably received by special-education professionals.

Six activities (Beam Up, Alphasaurus, ABC, Letter Getter, Moon Math, and Number Chick) help young children learn shapes, upper- and lowercase letters, and numerals. Parents can vary each game's content (such as specific letters of the alphabet) and speed of presentation. The child can use a joystick, game paddles, or the Muppet Learning Keys instead of the Apple keyboard, too.

SPRINGBOARD

Easy as ABC is one of the programs in Springboard's Early Games Series. Like other Springboard products, such as Certificate Maker and The Newsroom, it comes packaged in a sturdy plastic case and is accompanied by a well-written manual.

Easy as ABC includes five activities: Match Letters, Dot to Dot, Leap Frog, Lunar Letters, and Honey Hunt. Honey Hunt teaches uppercase and lowercase pairing, while Match Letters teaches simple word completion. Other activities teach alphabetic sequencing. All games feature colorful graphics. Easy as ABC requires only 48K and supports the joystick. The manual describes supplementary activities for learning the alphabet.

Springboard's support policy is outstanding. Simply stated, Springboard promises that if, within 30 days of the date of purchase, you decide that Easy as ABC isn't helping your child learn the alphabet, the company will refund your money. Any program warranted that well deserves a look, don't you think?

HARTLEY

You could never accuse Hartley of taking the shotgun approach to early learning. Instead of teaching colors, shapes, numbers, and letters in one program, Hartley software focuses on one area at a time, and has compiled them into the six programs of its Early Discoveries Series.

Children as young as two years old begin with **Colors and Shapes**, then proceed to **Patterns and Sequences**, **Size and Logic**, **Observation and Classification**, **Conservation and Counting**, and **Parquetry and Pictures.**

Each program in the series is similar in design to the others. Each program offers four games (except Parquetry and Pictures, which offers three). In Size and Logic, for instance, your child can play Farm Friends, Playmates, Fairy Fun, and Ant's Picnic. All games offer three levels of difficulty. Animation and audio rewards encourage the child in each activity.

Besides the program disk, learning accessories are included in each Early Discoveries package—anything from a home floor plan (in Observation and Classification) to pipe cleaners (in Patterns and Sequences). Flashcards are standard, as are stickers, which parents can use as incentives.

The supplementary activities described in each program manual are innovative and help children apply their newly acquired knowledge to everyday situations. Conservation and Counting, for instance, includes an away-from-the-computer cookie-making game. The child adds cardboard pieces representing chocolate chips to cardboard cookies that come in the box. Real cookie making supplements this simulation: You and your child follow the recipe given in the manual, with the youngster putting real chocolate chips or nuts into real cookies.

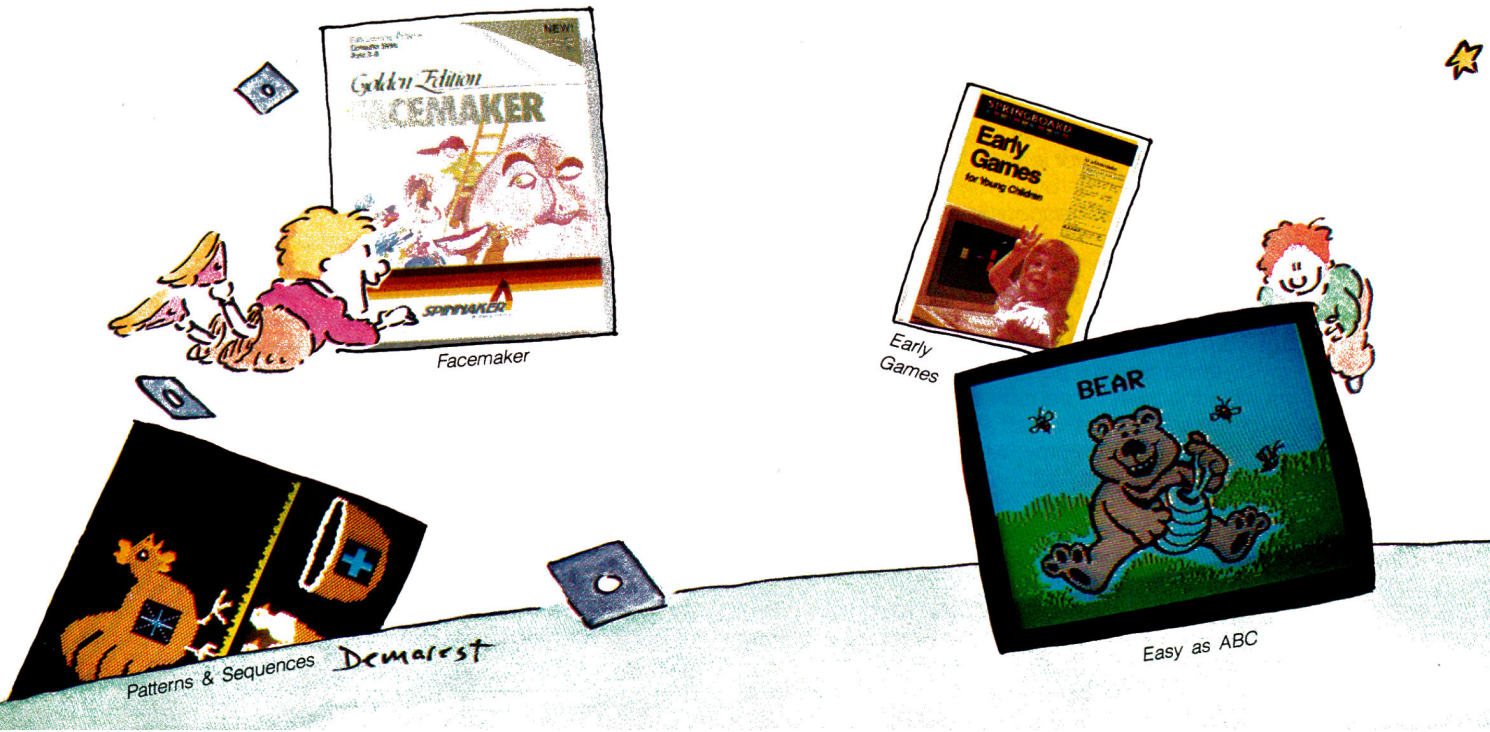
In Parquetry and Puzzles, the computer game Shape-up teaches children that objects are composed of individual geometric shapes. This activity is supplemented by a unique workshop project in which you help the child make a real jigsaw puzzle from his or her photograph, glued to a piece of pine board.

MINDSCAPE

The TinkTonk! series was designed by award-winning children's writer and illustrator Mercer Mayer. His robotic characters help young children learn the alphabet, obtain keyboard experience, and develop simple vocabulary and spelling skills. But TinkTonks perform their magic in a nontraditional way.

Tink's Adventure and **Tuk Goes to Town** feature interactive stories interspersed with appropriate learning games. The first lets the child make certain story decisions, such as whether Tink should take a helicopter or a boat on his adventure. Games in this program include Get Gas and Coconut Catch (teaching alphabetical order) and Go Fishing and Sinking Boat (keyboarding).

In Tuk Goes to Town, the child decides what vehicle Tuk will take and what scenes he'll pass on his way (Farm, Forest, Fair, or Seashore). At these locations, Tuk can play games—such as Animal Names, Hidden Shapes, or Which One Is Different.



If you think your child would enjoy the story lines that accompany these learning games and integrate them, consider Mindscape's TinkTonks.

DLM SOFTWARE

Animal Photo Fun is in a class by itself. Unlike the other packages described so far, which teach basic skills, this program teaches subject matter—animals and their habitats.

Six disk-based activities include Meet the Animals (learning which animals live in the desert, ocean, jungle, forest, pond, and on the farm), Odd One Out (sorting animals into habitat groups), Photo Safari (matching an animal with its habitat), Animal/Mom Match (matching mother and baby animals), and Animal Rummy 1 (playing against the computer) and 2 (with a friend).

Suggested for children aged 4–8, Animal Photo Fun requires some parental assistance for nonreaders. The program isn't as interactive as others I've seen; sometimes the computer seems to be doing most of the work.

Nevertheless, the subject matter should be interesting to young children. The program can help them build a foundation for an appreciation of nature and a later understanding of ecological issues.

A nice touch is the woman photographer who accompanies your child in these habitat games: Traditionally, you might expect such naturalists and adventurers to be men.

SPINNAKER

Long known for its line of quality educational software, Spinnaker offers **Facemaker**, software that teaches computer literacy to 3- to 8-year-olds in a charming way. The latest version (the Golden Edition) helps students learn to use the Apple by creating funny faces on screen.

Your child learns to use the keyboard, read simple phrases, and respond to menus. He or she "pastes" face parts from an assortment of predrawn eyes, ears, noses, mouths, and hairpieces. As a final touch, the child adds a body form and "extras" such as hats, collars, bow ties, mustaches, or eyeglasses.

Simple one-letter, mnemonic commands let the child write programs to animate the face. For example, the sequence "W-C-T-E-D" causes the caricature to wink (W), then cry (C), then stick out his or her tongue (T), then wiggle the ears (E), then dance (D).

In an accompanying memory game, the child watches an animated sequence the Apple selects. Then, using programming commands such as those described above, the child tries to write a program to mimic what the caricature just did—not as easy as you might think.

Unlike most early-learning programs, which seem to ignore printers, Facemaker lets the child print his or her caricatures in black-and-white on the Apple Scribe or ImageWriter. Let's hope Spinnaker will come up with a "platinum" edition of Facemaker—to support other popular printers and color.

THE LEARNING COMPANY

Gertrude's Secrets teaches "early thinking skills" in an entertaining, challenging way. Gertrude is a "Go-Getter Goose" who carries puzzle pieces (colored objects of various shapes, which the child sorts into boxes) as she flies through a maze—a series of puzzle rooms. A shape-editor utility lets the child erase or add parts to any piece.

The child uses the keyboard or joystick to figure out which pieces of the puzzle belong and which don't. Gertrude's Secrets includes increasingly difficult puzzle games. One-loop puzzles consist of one box; two-loop puzzles are composed of two intersecting boxes. The loops are simple Venn diagrams, which introduce the child to the concept of sets.

In more difficult puzzles, the child completes "one-difference"and "two-difference" trains—sequences of boxes in which each consecutive piece differs from the previous one in color, shape, or both.

Perhaps most challenging of all are the 3-by-3- and 4-by-4-array puzzles, in which the child must figure out color and shape patterns in a series of nine or 16 boxes, ordered in column and row format.

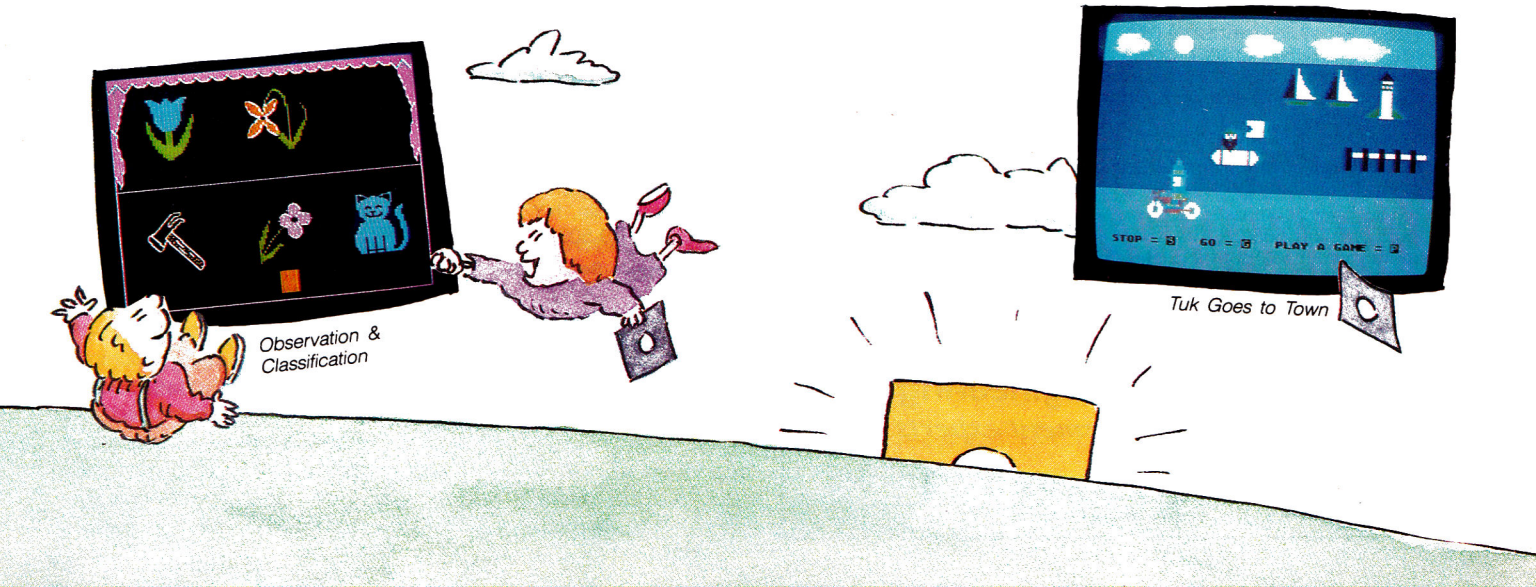
In addition, The Learning Company makes you an offer that's hard to turn down: According to company literature, "If for any reason you are not completely satisfied with any product from The Learning Company, we will gladly exchange it for another Learning Company title or refund your purchase price."

YOUR MOVE . . .

With the plethora of high-quality early-learning Apple II software now available, even the youngest members of your family can "work at the computer" and share in some of the excitement older brothers and sisters—and moms and dads, too—feel when they boot up a new program.

It's probably never too early to introduce your preschoolers to these marvelously interactive enrichment tools. Perhaps even the "terrible twos" will be less terrifying with a little help from another II—your Apple.■

Cynthia Field is the author of Field Trip, inCider's *bimonthly column on educational software. Write her at 10 Border Avenue, Wakefield, RI 02879. Enclose a self-addressed, stamped envelope if you'd like a personal reply.*



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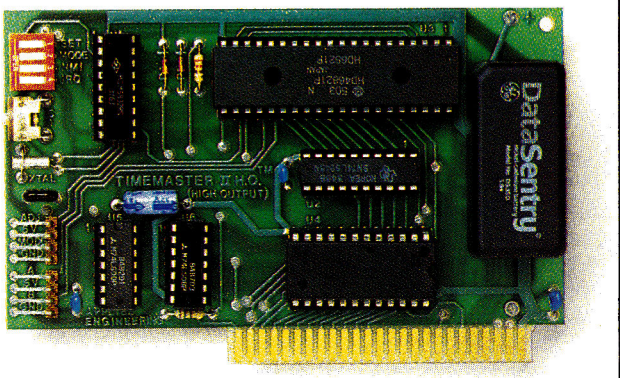

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Product Information

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DLM Inc.
P.O. Box 4000
Allen, TX 75002
(214) 727-3346
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Conservation and Counting
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$44.95, standard edition
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Reader Service Number 315

Getting Ready to Read and Add $59
Muppet Learning Keys, $79.95
Muppetville, $59
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Sierra On-Line
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Coarsegold, CA 93614
(209) 683-6858

Reader Service Number 338

Simon & Schuster Software
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(212) 373-8882

Reader Service Number 339

Tink's Adventure
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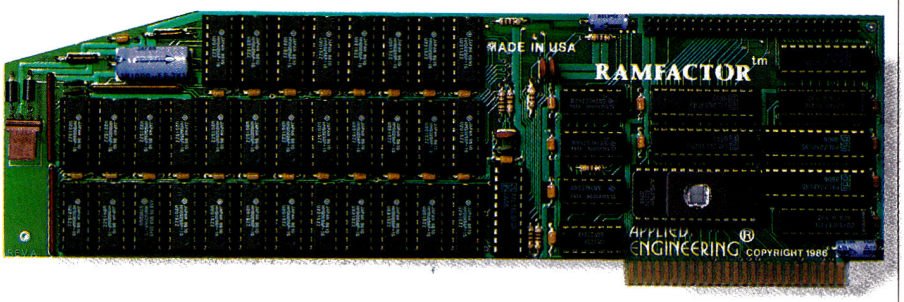

Very Compatible

All the leading software is already compatible with RamFactor. Programs like AppleWorks, Pinpoint, BPI, Managing Your Money, Dollars and Sense, SuperCalc 3A, PFS, MouseWrite, MouseDesk, MouseCalc, Sensible Speller, Applewriter IIe, Business Works, ReportWorks, Catalyst 3.0 and more. And RamFactor is fully ProDos, DOS 3.3, Pascal 1.3 and CP/M compatible. In fact, no other slot 1-7 memory card is more compatible with commercial software.

AppleWorks Power

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 all of 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 5¼", 3½", and hard disks. All this performance is available on the Apple II+, IIe, Franklin, or Laser 128 when used with an 80 column display. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

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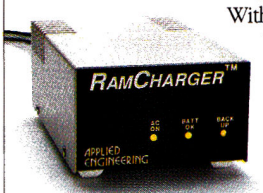

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Group contest	■ ■	■ ■	■ ■

■ = individual prizes ■ = school prizes

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IC8709

Preschool Follies



by Gary Noble

Even your preschooler can have fun with an Apple II. inCider *presents Preschool Follies, a musical introduction to typing and arithmetic.*

Computers for preschoolers? If your youngsters are fascinated by your Apple II and want to play with it, Preschool Follies (see the accompanying **Program listing**) will help them satisfy their curiosity. The five modules comprising the program range from a simple typing game suitable for 2-year-olds to an addition-and-subtraction module for children aged 5 to 6.

In most segments, the program continuously adjusts the level of difficulty to the skills of the child currently playing the game. The program also uses strings of inverse spaces to create graphics shapes, which the program can manipulate easily and mix with text anywhere on screen.

Mom or dad should type in the **Program listing** (a datastrip appears on p. 135 in this issue, for those with strip-reader hardware) and save it as FOLLIES. When it's time to play, boot the disk, and type RUN FOLLIES at the BASIC prompt. Preschool Follies starts with a menu listing the five game modules. Pressing Control-C anywhere in the program returns you to the menu for another selection.

TYPE-ANYTHING GAME

This segment is appropriate for children aged 2 to 3, though even a 5-year-old may enjoy using it to type his or her name and make designs with letters. Pressing any key simply prints that letter on screen in the Apple's 40-column mode. When your child presses a number key, the screen clears, and the computer counts out the number with a repeated shape and tone and the appropriate numeral.

Small children usually start by pressing keys randomly, but soon learn that pressing a number key elicits an interesting response from the Apple. The idea for this segment came from a program called "Michael's Game," published in the February 1983 *80 Micro* (CW Communications/Peterborough).

TYPE THE LETTER SHOWN

This game is fun for children aged 3 to 5. The program draws a box in the center of the screen and displays randomly a letter or number in the box. Your child gets two chances to press the correct key. A wrong answer produces a buzz, while the correct answer gives a short musical cue. After every five correct answers, the program displays a congratulatory message and plays one of three songs.

To avoid frustration when typing answers, the letter O is interchangeable with zero. Either key is correct for both

characters. Pressing Control-L alternately enables and disables lowercase characters. Because this segment is designed to teach only letter recognition, the program ignores the shift key. For example, pressing A with or without the shift key is correct for upper- and lowercase A.

COUNT THE SHAPES

Count the Shapes is the most popular part of the program with the 3- to 5-year-old set. A random number of shapes in any of 20 possible locations appear on screen, and the program gives the child two chances to count them and type the number. Again, wrong answers produce a buzz; correct answers earn a short musical cue.

The program's level of difficulty adjusts automatically to the child's ability by changing the maximum number of shapes. When your child answers half of the maximum number of problems correctly, the maximum number increases, shown in a congratulatory message while a song plays. If he or she gets half wrong, the maximum number decreases. After two wrong answers, the program counts the shapes by placing a number on each shape in sequence, accompanied by a tone. Although the number and location of the shapes the program displays are random, the maximum number starts out at five (shown at the top right of the screen) and ranges from two to 20.

ADDITION

Addition (for 4- to 6-year-olds) displays up to eight shapes on the top half of the screen, while a flashing question mark signals the child to guess the count. One wrong answer allows another guess, but a second wrong answer causes the program to count the shapes. After the child answers correctly or the program counts the shapes, Addition draws a line (with sound effects) to divide the screen, then displays up to eight more shapes in the bottom half. When the child counts them, Addition draws another line, and the problem appears in numeric form at the bottom of the screen, waiting for the child to type the sum of the two sets of shapes.

Like Count the Shapes, Addition plays a song and increases the maximum number of shapes after enough correct answers, while it decreases the maximum after a certain number of wrong answers. The maximum starts at four (per set of shapes) and ranges from two to eight.

SUBTRACTION

Subtraction is identical in concept to the Addition segment and uses the same code, but the child subtracts the second set of shapes from the first set. The number of shapes in the second set is always less than or equal to the number of shapes in the first.

All responses require only a single keystroke—your child never has to use the return key. Problems that require two digits wait automatically for another keystroke if the first key is 1 or 2.

PROGRAM MODIFICATIONS

You can add songs or shapes to Preschool Follies for variety. Calculate the value for notes on a chromatic scale with the formula N(X) = 256/2^(X/12). If you add songs, change the maximum number for X in line 2320 so that the random-number calls correspond to the new number of songs. (Don't forget to also change the DIM statement.)

If you add shapes, simply change the variable NS in line 2220 to equal the new number of shapes. If the counting game becomes too easy, you can modify it easily to run in 80-column mode. After specifying new locations, you can display a maximum of 40 shapes on screen.

Adding multiplication to the last module is another modification you can make. Adding division requires a new module, though, because the addition/subtraction module carries a maximum of eight for each number, limiting the number of possible division problems. Adults who want to do a bit of programming can have almost as much fun as their kids with Preschool Follies.■

Write to Gary Noble at 1422 172nd Place S.W., Lynnwood, WA 98037.

Program listing. Preschool Follies.

```
10  REM ************************
20  REM
30  REM      PRESCHOOL FOLLIES
40  REM
50  REM       COPYRIGHT 1986
60  REM
70  REM       GARY P. NOBLE
80  REM
90  REM  ************************
100  ONERR  GOTO 1840
110  HOME : PRINT  CHR$ (27) CHR$ (17): VTAB 12: HTAB 13: PRINT
     "PRESCHOOL FOLLIES": VTAB 14: HTAB 6: PRINT "COPYRIGHT 1
     986 BY GARY P. NOBLE"
120  DEF  FN RA(X) =  INT ( RND (1) * X) + 1
130  DIM LH(20),LV(20),N(3,50),LC(20)
140  GOSUB 2130
150  HOME : PRINT  CHR$ (27) CHR$ (17): VTAB 2: PRINT "(1) TY
     PE ANYTHING GAME": VTAB 4: PRINT "(2) TYPE THE LETTER SH
     OWN": VTAB 6: PRINT "(3) COUNT THE SHAPES": VTAB 8: PRINT
     "(4) ADDITION": VTAB 10: PRINT "(5) SUBTRACTION"
160  PRINT : PRINT "Parents, type CONTROL-C (CONTROL and C  t
     ogether) for 'Change' to bring back    these choices."
170  PRINT : PRINT "Enter your choice (1, 2, 3, 4, or 5)..."
180  GOSUB 1750
190 AD = 1: ON  VAL (A$) GOTO 220,340,590,1060,1050
200  PRINT  CHR$ (7): GOTO 150
210  REM  ************* TYPE ANYTHING GAME *************
220  HOME :LC = 0: PRINT "TYPE ANYTHING GAME": PRINT
230  GOSUB 1750
240  IF  VAL (A$) > 0 THEN 270
250  PRINT A$" ";:LC = LC + 1: IF LC = 20 THEN LC = 0: PRINT
     : PRINT
260  GOTO 230
270  HOME
280 LL = 200 - 9 *  VAL (A$): REM  CONTROLS LENGTH OF TONE
290 SH =  FN RA(NS)
300  FOR X = 1 TO  VAL (A$)
310  HTAB LH(X) + L2(SH): VTAB LV(X): INVERSE : PRINT SH$(SH)
     ;: NORMAL : HTAB LH(X) + 3: VTAB LV(X) + 2: PRINT X;: POKE
     769,LL: CALL 770: FOR Z = 1 TO 650 - 20 *  VAL (A$): NEXT
     : NEXT
320  PRINT : PRINT : PRINT :LC = 0: GOTO 230
330  REM  ************* TYPE THE LETTER SHOWN *************
340  HOME : PRINT "   PRESS THE LETTER OR NUMBER SHOWN";
350  VTAB 24: HTAB 1: IF LW = 0 THEN  PRINT "Type CONTROL-L t
     o add lower case";: GOTO 370
360  PRINT "Type CONTROL-L to remove lower case";
370 A =  FN RA(67):A = A + 55
380  IF A < 65 THEN A = A - 7
390  IF LW = 0 AND A > 90 THEN 370
400  IF A > 90 AND A < 97 THEN 370
410  IF A < 91 THEN A1 = A + 32
420  IF A > 96 THEN A1 = A - 32
430  GOSUB 1860: HTAB 20: VTAB 13: PRINT  CHR$ (A)
440  GOSUB 1750
450  IF A$ =  CHR$ (12) AND LW = 0 THEN LW = 1: GOTO 340
460  IF A$ =  CHR$ (12) AND LW = 1 THEN LW = 0: GOTO 340
470  IF A =  ASC (A$) OR A1 =  ASC (A$) THEN SC = SC + 1: GOTO
     520
480  IF (A = 79 AND A$ = "0") OR (A = 111 AND A$ = "0") OR (A
      = 48 AND A$ = "O") OR (A = 48 AND A$ = "o") THEN SC = S
     C + 1: GOTO 520: REM  MAKES ZEROS AND O'S INTERCHANGEABL
     E AS ANSWERS
490 BL = 80: GOSUB 1820
500  IF MI = 0 THEN MI = 1: GOTO 440
510 MI = 0: GOTO 370
520 MI = 0: GOSUB 1960: REM  SHORT MUSIC
530  IF SC < 5 THEN 370
540  HOME : VTAB 13: PRINT "YOU JUST GOT 5 RIGHT!!!";
550  FOR X = 1 TO 500: NEXT
560 SC =  FN RA(3): GOSUB 1900: REM   LONG MUSIC
570 SC = 0: GOTO 340
580  REM  *************** COUNT THE SHAPES *************
590  HOME : PRINT "COUNT THE SHAPES--LARGEST NUMBER IS:";
600 MX = 5:BA = 0:CT = 0
610  VTAB 1: HTAB 38: PRINT MX;" ";
620  HTAB 1: VTAB 2: CALL  - 958: REM CLEAR THE SCREEN FROM C
     URSOR DOWN
630  GOSUB 710
640  HTAB 1: VTAB 22: PRINT "YOUR GUESS...  ";: HTAB 14
650  GOSUB 1750: PRINT A$
660  IF NU > 9 AND (A$ = "1" OR A$ = "2") THEN B$ = A$: GOSUB
     1750:A$ = B$ + A$
670  IF  VAL (A$) = NU THEN  GOSUB 790: GOTO 610
680  GOSUB 900: IF WW = 1 THEN  GOTO 640
690  GOTO 610
```

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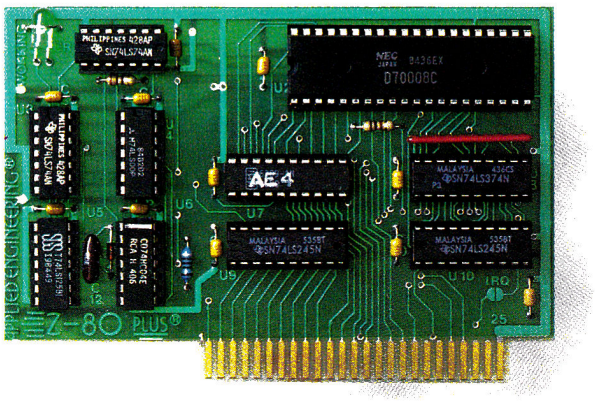

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Listing continued.

```
700  REM **PICK A NUMBER, PRINT THAT MANY SHAPES ON THE SCREE
     N ROUTINE
710  FOR X = 1 TO 20:LC(X) = 0: NEXT
720 NU =  FN RA(MX): FOR X = 1 TO NU
730 Y =  FN RA(20): IF LC(Y) = 1 THEN 730
740 LC(Y) = 1: NEXT
750 SH =  FN RA(NS): FOR X = 1 TO 20: INVERSE
760  IF LC(X) = 1 THEN  HTAB LH(X) + L2(SH): VTAB LV(X): PRINT
     SH$(SH);
770  NEXT : NORMAL : RETURN
780  REM **CORRECT ANSWER ROUTINE
790 WW = 0:CT = CT + 1: GOSUB 1960: REM    SHORT MUSIC
800  IF CT <  > INT (MX / 2 + 1) THEN  RETURN
810 CT = 0:BA = 0:
820  HTAB 1: VTAB 2: CALL  - 958: REM   CLEAR THE SCREEN FROM
     CURSOR DOWN
830 MX = MX + 1: IF MX = 21 THEN MX = 20: GOTO 860
840  VTAB 12: HTAB 2: PRINT "GOOD, YOUR LARGEST NUMBER IS NOW
     "MX"."
850  VTAB 1: HTAB 38: PRINT MX;" ";
860 SG =  FN RA(3): GOSUB 1900: REM  LONG MUSIC
870  FOR X = 1 TO 500: NEXT : RETURN
880  RETURN
890  REM **WRONG ANSWER ROUTINE
900 BL = 50: GOSUB 1820: REM   BUZZ
910  FOR Y = 1 TO 500: NEXT
920  IF WW = 0 THEN WW = 1: RETURN
930 WW = 0:CN = 0
940  FOR X = 1 TO 20: IF LC(X) = 0 THEN 990
950 CN = CN + 1: HTAB LH(X) + 3: VTAB LV(X) + 2: PRINT CN;
960 LL = 200 - 9 * NU: POKE 769,LL: REM    CONTROLS LENGTH OF
     TONE
970  CALL 770
980  FOR Y = 1 TO 650 - 20 * NU: NEXT
990  NEXT
1000  FOR X = 1 TO 2000: NEXT :BA = BA + 1
1010  IF BA =  INT (MX / 2 + 1) THEN MX = MX - 1:BA = 0:CT =
     0
1020  IF MX = 1 THEN MX = 2
1030  RETURN
1040  REM  ************** ADDITION/SUBTRACTION **************
1050 AD = 0: REM  ENTRY POINT FOR SUBTRACTION
1060 MA = 4: REM   ENTRY POINT FOR ADDITION
1070  FOR X = 1 TO 4: REM  ADJUST SCREEN LOCATIONS FOR THIS M
     ODULE
1080 AH(X) = LH(X):AV(X) = LV(X)
1090 AH(X + 4) = LH(X + 5):AV(X + 4) = LV(X + 5)
1100 BH(X) = LH(X + 10):BV(X) = LV(X + 10)
1110 BH(X + 4) = LH(X + 15):BV(X + 4) = LV(X + 15): NEXT
1120  HOME : PRINT "**********";
1130  IF AD THEN  PRINT "** ADDITION *";: GOTO 1150
1140  PRINT " SUBTRACTION ";
1150  PRINT "********** ";
1160  PRINT " MAX:"MA;
1170 SH =  FN RA(NS)
1180 TE =  FN RA(MA): IF TE = N1 THEN 1180
1190 N1 = TE
1200  IF AD THEN N2 =  FN RA(MA): GOTO 1220
1210 N2 =  FN RA(N1)
1220  INVERSE : FOR Y = 1 TO N1: HTAB AH(Y) + L2(SH): VTAB AV
     (Y): PRINT SH$(SH);: NEXT : NORMAL
1230 XH = 38:XV = 6: GOSUB 2030
1240  IF  VAL (A$) <  > N1 THEN BL = 50: GOSUB 1820: GOSUB 20
     30
1250  IF  VAL (A$) = N1 THEN 1320
1260 BL = 50: GOSUB 1820: FOR X = 1 TO 500: NEXT
1270 LL = 200 - 9 * N1: REM  CONTROLS LENGTH OF TONE
1280  FOR X = 1 TO N1: HTAB AH(X) + 3: VTAB AV(X) + 2: PRINT
     X;
1290  POKE 769,LL: CALL 770
1300  FOR Y = 1 TO 650 - 20 * N1: NEXT : NEXT
1310  HTAB XH: VTAB XV: PRINT N1;: GOTO 1340
1320  GOSUB 1960: REM  SHORT MUSIC
1330  FOR X = 1 TO 750: NEXT
1340  HTAB 1: VTAB 11: FOR X = 1 TO 32: PRINT "-";: POKE 769,
     30: POKE 768,255 - 5 * X: CALL 770: NEXT
1350  HTAB 38: IF AD THEN  PRINT "+";: GOTO 1370
1360  PRINT "-";
1370  INVERSE : FOR Y = 1 TO N2: HTAB BH(Y) + L2(SH): VTAB BV
     (Y): PRINT SH$(SH);: NEXT : NORMAL
1380 XH = 38:XV = 16: GOSUB 2030
1390  IF  VAL (A$) <  > N2 THEN BL = 50: GOSUB 1820: GOSUB 20
     30
1400  IF  VAL (A$) = N2 THEN 1490
1410 BL = 50: GOSUB 1820: FOR X = 1 TO 500: NEXT
1420 LL = 200 - 9 * N2: REM  CONTROLS LENGTH OF TONE
1430  FOR X = 1 TO N2: HTAB BH(X) + 3: VTAB BV(X) + 2: PRINT
     X;
1440  POKE 769,LL: CALL 770
1450  FOR Y = 1 TO 650 - 20 * N2: NEXT : NEXT
1460  FOR Y = 1 TO 650 - 20 * N2: NEXT
1470  HTAB XH: VTAB XV: PRINT N2;
1480  GOTO 1510
1490  GOSUB 1960: REM   SHORT MUSIC
1500  FOR X = 1 TO 750: NEXT
1510  HTAB 1: VTAB 21: FOR X = 1 TO 32: PRINT "*";: POKE 769,
     30: POKE 768,255 - 5 * X: CALL 770: NEXT
1520  HTAB 36: PRINT "  "
1530  IF AD THEN S$ = " + ":N3 = N1 + N2: GOTO 1550
1540 S$ = " - ":N3 = N1 - N2
1550  IF N3 > 9 THEN X = 0: GOTO 1570
1560 X = 1
1570  VTAB 23: HTAB 29 + X: PRINT N1;S$;N2;" = ";
1580 XV = 23:XH = 37 + X: GOSUB 2030
1590  IF A$ = "1" AND N3 > 9 THEN XH = 38: GOSUB 2030:A$ = "1
     " + A$
1600  IF  VAL (A$) <  > N3 AND WR = 0 THEN BL = 50: GOSUB 182
     0:WR = 1: HTAB 37 + X: PRINT "  ";: GOTO 1550
1610  IF  VAL (A$) = N3 THEN  GOSUB 1960:CC = CC + 1: GOTO 16
     40
1620 WW = WW + 1:BL = 50: GOSUB 1820: FOR Y = 1 TO 5: HTAB 37
      + X: PRINT "  ";: FOR Z = 1 TO 100: NEXT : HTAB 37 + X:
      VTAB 23: PRINT N3;: CALL 770: NEXT
1630  IF WW >  = MA / 2 THEN MA = MA - 1:WW = 0: IF MA = 1 THEN
     MA = 2
```

Listing continued.

Listing continued.

```
1640  FOR Y = 1 TO 1500: NEXT :WR = 0
1650  IF MA = CC THEN MA = MA + 1: GOSUB 1680
1660  IF WW = MA / 2 THEN MA = MA - 1:WW = 0:CC = 0: IF MA <
      2 THEN MA = 2
1670  GOTO 1120
1680  IF MA = 9 THEN MA = 8
1690  HOME : VTAB 10: IF WW = 0 THEN  HTAB 5: PRINT "VERY ";:
      GOTO 1710
1700  HTAB 8
1710  PRINT "GOOD, YOU JUST GOT:": HTAB 10: PRINT CC" RIGHT":
      HTAB 10: PRINT WW" WRONG"
1720  VTAB 14: HTAB 14: PRINT "YOUR MAXIMUM IS NOW "MA
1730 SG =  FN RA(3)f GOSUB 1900: FOR X = 1 TO 500: NEXT :CC =
     0:WW = 0: RETURN
1740  REM  **** GET A$ ROUTINE AND RANDOMIZE THE RND FUNCTION
      ****
1750  POKE 49168,0
1760 KEY =  PEEK (49152)
1770 RR = RR - 1: IF RR <  - 32000 THEN RR =  - 1
1780  IF KEY < 128 THEN 1760
1790 A$ =  CHR$ (KEY - 128): IF Z9 = 0 THEN Z9 =  RND (RR)
1800  POKE 49168,0: RETURN
1810  REM  **** BUZZ THE SPEAKER ****
1820  FOR BU = 1 TO BL:BZ =  PEEK (49200):BZ = BL: NEXT : RETURN
      : REM  BZ=BL IS A TIME DELAY DURING BUZZ
1830  REM  **** CLEAR THE ERROR AND GO TO MENU ****
1840  CALL  - 3288: GOTO 150
1850  REM  **** PRINT A BOX FOR THE LETTERS ****
1860  INVERSE : HTAB 17: VTAB 10: PRINT "          "
1870  FOR BX = 1 TO 5: HTAB 17: PRINT " ":: HTAB 23: PRINT "
     ": NEXT
1880  HTAB 17: PRINT "          ": NORMAL : RETURN
1890  REM  **** PLAY SONG NUMBER SG (LONG MUSIC) ****
1900  FOR AA = 1 TO SL(SG)
1910  IF N(SG,AA) > 600 THEN LL = 255: POKE 768,N(SG,AA) - 60
      0: GOTO 1940
1920  IF N(SG,AA) > 300 THEN LL = 128: POKE 768,N(SG,AA) - 30
      0: GOTO 1940
1930 LL = 64: POKE 768,N(SG,AA)
1940  POKE 769,LL: CALL 770: NEXT : RETURN
1950  REM  **** SHORT MUSIC ROUTINE ****
1960 LL = 20:N = 127: GOSUB 2010
1970 N = 151: GOSUB 2010
1980 N = 143: GOSUB 2010
1990 N = 113: GOSUB 2010
2000  RETURN
2010  POKE 768,N: POKE 769,LL: CALL 770: RETURN
2020  REM  **** FLASH "?" AT (XH,XV), GET ANSWER, PRINT ANSWE
     R AT (XH,XV) ****
2030 FL = 0: POKE 49168,0
2040  HTAB XH: VTAB XV: IF FL THEN  PRINT "?";:FL = 0: GOTO 2
      060
2050  PRINT " ";:FL = 1
2060 KEY =  PEEK (49152)
2070  IF KEY < 128 THEN 2040
2080 A$ =  CHR$ (KEY - 128): POKE 49168,0: HTAB XH: VTAB XV: PRINT
     A$;: RETURN
2090  REM
2100  REM  **** INITIAL SETUP OF VARIABLES ****
2110  REM
2120  REM  **** SET UP SHAPE STRINGS ****
2130 D$ =  CHR$ (10):B$ =  CHR$ (8)
2140 SH$(1) = "       " + D$ + B$ + B$ + B$ + B$ + B$ + B$ + "
      " + D$ + B$ + B$ + B$ + B$ + B$ + B$ + B$ + "
      " + D$ + B$ + B$ + B$ + B$ + B$ + B$ + "       ": REM  5
     ,7,7,5 SPACES
2150 SH$(2) = "  " + D$ + B$ + B$ + "    " + D$ + B$ + B$ + B$ +
     B$ + "      " + D$ + B$ + B$ + B$ + B$ + B$ + B$ + "
       ": REM  1,3,5,7 SPACES
2160 SH$(3) = "          " + D$ + B$ + B$ + B$ + B$ + B$ + B$ +
     B$: REM  7 SPACES
2170 SH$(3) = SH$(3) + SH$(3) + SH$(3) + "         ": REM  7 SP
     ACES
2180 SH$(4) = "        " + D$ + B$ + B$ + B$ + B$ + B$ + B$ +
     "      " + D$ + B$ + B$ + B$ + B$ +  + B$ + "      " + D$ +
     B$ + B$ + B$ + B$ + B$ + B$ + "        ": REM  7,5,5,7 SP
     ACES
2190 SH$(5) = D$ + "  KAY  "
2200 SH$(6) = D$ + "  GARY "
2210 L2(1) = 1:L2(2) = 3:L2(3) = 0:L2(4) = 0:L2(5) = 0:L2(6) =
     0: REM  OFSETS FOR PRINTING
2220 NS = 6: REM  NUMBER OF SHAPES
2230  FOR X = 1 TO 5
2240  REM  **** SET UP THE 20 PRINT LOCATIONS ****
2250 LH(X) = (X - 1) * 8 + 1:LH(X + 5) = LH(X):LH(X + 10) = L
     H(X):LH(X + 15) = LH(X)
2260 LV(X) = 2:LV(X + 5) = 7:LV(X + 10) = 12:LV(X + 15) = 17
2270  NEXT
2280  REM  **** POKE SOUND ROUTINE AT LOCATION 770 ****
2290  FOR X = 770 TO 790: READ Y: POKE X,Y: NEXT
2300  DATA  173,48,192,136,208,5,206,1,3,240,9,202,208,245,17
     4,0,3,76,2,3,96
2310  REM  **** LOAD NOTES FOR 3 SONGS ****
2320  FOR X = 1 TO 3
2330 Y = 1
2340  READ N(X,Y)
2350  IF N(X,Y) <  > 0 THEN Y = Y + 1: GOTO 2340
2360 SL(X) = Y - 1
2370  NEXT
2380  POKE 768,150: REM   STARTING TONE FOR SINGLE TONE MUSIC

2390  DATA 128,128,128,171,152,152,471,102,102,114,114,728,17
     1,128,128,128,171,152,152,471,102,102,114,114,728,0
2400  DATA  128,128,85,85,76,76,385,96,96,102,102,114,114,428
     ,85,85,96,96,102,102,414,85,85,96,96,102,102,414,128,128
     ,85,85,76,76,385,96,96,102,102,114,114,428,0
2410  DATA  102,114,128,114,102,102,402,114,114,414,102,85,3
     85,102,114,128,114,102,102,102,102,114,114,102,114,728,0

2420  RETURN
6000  IF (A = 79 AND A$ = "0") OR (A = 111 AND A$ = "0") OR (
     A = 48 AND A$ = "O") OR (A = 48 AND A$ = "0") THEN SC =
     SC + 1: GOTO 520
```

End of listing.

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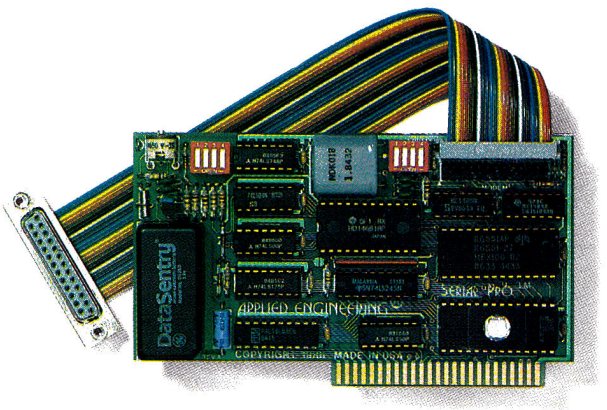

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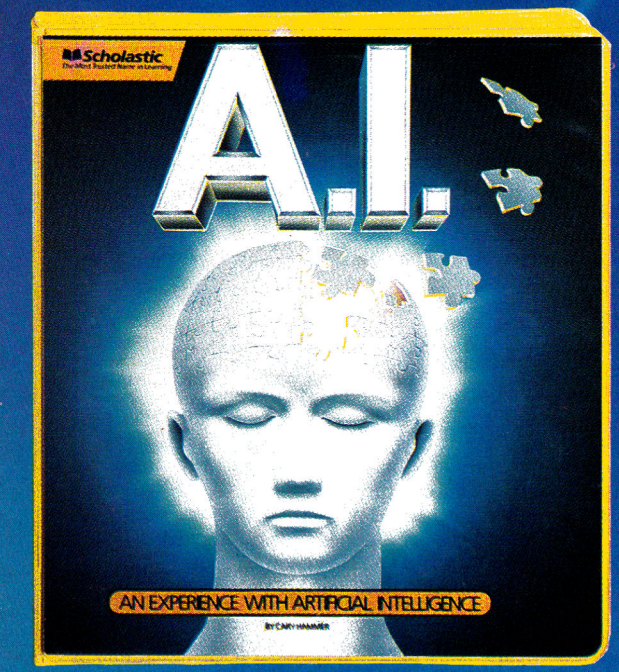

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Did Your Dealer Let You DOWN?

Dealers are an essential part of the Apple network. How can you find the right combination of courteous attention and prompt service?

by Lindsay Yarnall McGrath

In 1980, Kent Fillmore walked into a dealership to buy his first Apple, a II Plus. He was interested primarily in graphics, but he wasn't computer savvy enough to disagree with the saleswoman who told him he needed an extra $1000 worth of equipment, including a RAM-expansion card and graphics software. After the purchase, she couldn't offer any support when he had questions about the software.

Two months later, Apple introduced the IIe. At that time no upgrade was available for Fillmore's computer. "I was totally ignorant when I walked in there and totally broke when I walked out," he recalls.

Fillmore is now president of International Apple Core in San Francisco. He says his experience with dealers prompted him to work with user groups, so that he could keep others from suffering through similar experiences. (See the accompanying box, "User-Group Information," for addresses and phone numbers of the organizations mentioned here. Also check "Not for Hackers Only" and "Guide to User Groups," September 1985, pp. 16 and 105, respectively, for further details. To find the Apple user group nearest you, call 800-538-9696, extension 500.)

If you're thinking things haven't changed much since 1980, you're not alone. Dealing with dealers is still a frustrating, expensive adventure. Finding a good dealer isn't easy. It's not impossible, either, say Apple users—but you have to be willing to answer a lot of questions before you even begin looking. For example, how do *you* define a good dealer? What level of service and support do you expect from a dealer? How much of a discount represents a good deal?

YOU BETTER SHOP AROUND

Jerry Cline, president of the Phoenix-based Arizona Apple User Group, has some simple advice for users when it comes to buying: "Shop a lot and buy a little."

Many computer shoppers appear to be following his advice. According to one estimate, a first-time computer buyer visits an average of five stores before deciding on a system. While this approach is time-consuming, it seems to pay off.

For example, Cathleen Merritt, director of the National AppleWorks Users Group in Canton, Michigan, says working with a dealer was invaluable when she decided to produce her club's newsletter by converting IIe files to Macintosh format. Merritt says she was discouraged at first, though, when one dealer told her it would require $85 and a couple of days to transfer all the files from one Apple IIe floppy to a Mac disk. Merritt continued searching and found another dealer who did the job for $15 in about 30 minutes.

ADVICE FOR THE DEALER-BOUND

There are about 2000 Apple dealers in the U.S., but there's no quick-and-easy way to find a good one. You can take steps to make working with dealers more satisfying, though. The following pointers were culled from conversations with Apple users across the country:

- Do your part: Be able to explain your needs to a dealer when you go in for your initial visit.
- Ask a lot of questions. If you're buying your first computer, shop with a friend who knows computers. Before you even step into the store, call first and ask a routine technical question. The way the dealer's representative treats you over the phone may be a good indication of how you'll fare once you're in the store.
- Find out whether your local Apple user group has any information on a particular dealer.
- Follow a good salesperson. Quality of service varies among stores and even among people working in one Apple dealership. Turnover in computer stores is high. If you find a good salesperson, don't hesitate to follow him or her to another store.
- When visiting a store, check out more than just the computers. Ask to see the dealer's repair area—it may tell you a lot about its turnaraound. A lot of open computers lying about may indicate a backlog in service. Find out whether the store loans machines.
- Visit more than one store. If possible, find a dealer who stocks the entire Apple II line. Ask the salesperson to explain the unique advantages of each system. Don't get stuck with a dealer who tries to sell you an Apple IIc just because he or she is out of the other II machines.
- If you're unhappy with your system or your dealer's service, discuss your concerns with the store management. If you can't resolve matters, contact Apple Computer for help; your regional Apple office is a good place to start. Many user groups also have dealer-relations committees or members who specialize in helping users and dealers iron out their differences.

User-Group Information

Richard Bloom
Boston Computer Society
One Center Plaza
Boston, MA 02108
(617) 367-8080

Dick Hubert, CEO
A.P.P.L.E. Co-op
290 S.W. 43rd Street
Renton, WA 98055
(206) 251-5222

Andy Reese, Chairman
Apple Corps of Dallas
P.O. Box 835537
Richardson, TX 75083
(214) 357-9185

Jerry Cline, President
Arizona Apple
User Group
3035 East Topaz Circle
Phoenix, Az 85028
(602) 277-8511

Kent Fillmore, President
International Apple Core
P.O. Box 880338
San Francisco, CA 94188
(415) 863-7412

Cathleen Merritt, Director
National AppleWorks
Users Group
P.O. Box 87453
Canton, MI 48187
(313) 397-1594

Lavona Rann, Chairman
Third Apple Users
1113 Wheaton Oaks
Drive
Wheaton, IL 60187
(312) 665-6319

Tom Warrick, President
Washington Apple Pi
8227 Woodmont Avenue
#201
Bethesda, MD 20814
(301) 654-8060

THE SERVICE AND SUPPORT DEBATE

Service and support constitute two of the biggest areas of debate between dealers and users. Most users say dealers don't offer enough, while dealers say customers' demands for support are already stretching them to the limit.

Apple dealers don't know enough about Apple computers, users say, or what Apple is doing with software updates, including upgrades for AppleWorks and ProDOS. Many dealers don't support customers once they've bought their equipment and left the store, users claim.

Some warn that dealerships, especially large ones that carry multiple brands of computers, may try to sell you a more expensive computer, even if an Apple II system fits your needs. "The Apple II series isn't recognized as a big-business system," says Richard Bloom, group director of Apple/Boston, the Apple II user group of the Boston Computer Society. "When you go into a big store, they're looking to sell you an IBM, a clone, or some other business system."

While dealer-user relationships vary, Tom Warrick, head of the 5200-member Washington Apple Pi, based in Bethesda, Maryland, points out some of the customer's basic rights when buying an Apple system.

First, he says, your dealer should set up your new system for you or show you how to do it yourself—a particularly important service for Apple II systems that include modems and printers. If your system breaks down within a few days of its purchase, a dealer should replace the merchandise immediately, instead of treating it as a regular warranty repair. A dealer should be able to answer your technical questions or know where to send you for help. If your dealer doesn't have the answers, your local user group is the perfect place to find technical advice, he adds.

Many Apple dealers acknowledge these concerns, but contend that providing ideal service and support isn't as simple as it appears.

Although Pat Kearney, Apple's manager of U.S. dealer operations, says dealers make average gross profit margins of 20 to 25 percent, some dealers say they make much less. Price competition has become so fierce, one dealer reports, that his margin on an Apple IIc color system dropped below 10 percent during a recent sales negotiation. This kind of pricing pressure has made many dealers begin charging separately for service and support.

YOU GET WHAT YOU PAY FOR

Widespread price competition encourages some users to shop solely for price and to demand the biggest discount and best support from a full-service dealer. Other users try a different tack: They'll visit a dealer, become educated about the hardware and software they need, then leave and buy their systems from a discount computer store. Both ways of buying computers contribute to higher prices.

Many Apple users who buy their systems from stores offering little support end up looking for technical advice at a full-service Apple dealer. Dealers, however, say they don't have the resources to support users who buy their Apple systems from discounters or unauthorized "gray-market" dealers, who sell Apple products illegally.

Andy Reese, head of the Apple Corps of Dallas, says expecting outstanding support for the lowest price is contradictory: "If you demand the lowest price, you're going to give something up—often service."

Some users recognize dealers' problems and are beginning to work with them to help provide support. The Third Apple Users group, based in Wheaton, Illinois, matches people interested in specific applications with experienced members; sometimes they'll refer a user to a local dealer who they know will provide real consulting services, not just a sales pitch.

The Third Apple Users group found a way to help dealers cope with the ever-growing demand for support, while educating its own members. According to Chairman Lavona Rann, one local dealer hires user-group members on a part-time basis and sends them to authorized Apple training classes. These knowledgeable users tend to stay on the job longer than other employees, she says—something both users and dealers appreciate.

APPLE USERS AS DEALERS

In Renton, Washington, members of the Apple Puget-Sound Public Library Exchange (A.P.P.L.E.) took the approach "if you want something done right, do it yourself" and became dealers themselves.

While many user groups sell a few software products by mail order, the A.P.P.L.E. Co-op takes that idea a step further. The group's store, which opened in 1983, offers everything from Apple repair service to software from manufacturers such as Electronic Arts. The Co-op isn't currently authorized to carry Apple computers, however, and has decided against carrying Apple clones.

Dick Hubert, chief executive officer of the A.P.P.L.E. Co-op, says he thinks the need for the store arose because users weren't satisfied with the level of service they were receiving from area dealers. "They weren't getting the service that normal dealer markup should have been associated with," he notes. Apple dealers in his area haven't reacted favorably to the user group's move into their territory, he adds: "Because of the volume of products we sell, we're very price competitive with the dealers."

According to Hubert, the Co-op repairs Apples all the way down to the board level and has found sources for Apple parts primarily through mail-order parts suppliers.

Dealers: Caught in the Middle of the Apple Network?

If you're wondering what you can expect from dealers, it may be helpful to know what Apple requires of them.

According to Pat Kearney, Apple's manager of U.S. dealer operations, the company publishes a set of guidelines for dealers who carry Apple II products. First, an Apple II dealer must be able to service and support all II products. Second, dealers must send representatives to Apple sales training focusing specifically on the II line. And, finally, they must be able to offer ongoing training to their customers. According to Kearney, the company won't renew a dealer's yearly contract if the dealer doesn't meet Apple's guidelines.

Last year, Apple didn't renew contracts with about 600 dealers. "The reason we cut back was to make sure the [dealers] who were truly supporting [Apple] products would be profitable," Kearney explains.

While Apple's move has strengthened its dealer channel, many dealers say they're caught in the middle and must grapple with pressure from the company, including product-distribution problems, and from customer demands resulting in fierce price competition.

"Product availability is a real killer with Apple," says Phil Hess, vice president of Data Domain of Schaumburg, Illinois. "The IIGS was the worst situation." Apple rolled out the GS in September 1986. But between September and last January, Hess' store received only four machines, much to the dismay of his customers. Although availability is fine now, Hess says, at the time "it didn't make us look very professional."

In addition, another dealer notes, many third-party manufacturers put dealers in a bad position by announcing and advertising products that won't be available for months, leaving end users enraged by empty shelves and explanations.

Support can be a problem, too. Apple dealers say that stores denying support to customers are almost as much of a problem to them as they are to users. Many dealers who sell strictly on price leave customers high and dry when it comes to ongoing help with their computer systems. And these dissatisfied users wander into more reputable dealerships to look for free help.

Apple's marketing strategy means dealers will remain important to users; your satisfaction with the computer may depend to some extent on the quality of your relationship with an Apple dealer. Knowing more about your dealer's operation may prevent the frustration of not getting what you thought you paid for.□ **—L.Y.McG.**



The store also maintains a healthy hardware and software mail-order business. In addition, the A.P.P.L.E. Co-op store does extensive product testing to ensure that customers don't encounter compatibility problems when they buy non-Apple-brand peripherals and software.

The store is open to the public and charges members and nonmembers the same prices. The Co-op pays dividends only to its members, however (more than 50,000 users).

Hubert says A.P.P.L.E. wants its Co-op to become an official Apple dealer. If the Co-op store receives authorization, Hubert says, "we'll be competitive with other Apple dealers in the area."

While the A.P.P.L.E. Co-op has taken a dramatic step to ease its concern about working with dealers, other users are taking more subtle approaches. For instance, when Apple released the IIGS, Richard Bloom contacted a dealer and asked whether he'd be willing to work out a special package price for group members interested in buying the new system. The dealer agreed. He sold the GS at the regular price, but discounted the peripherals included with the system (color monitor, ImageWriter printer, and two disk drives) to just under $2600. He sold about 20 systems.

CAN'T LIVE WITH THEM . . .

In the world of Apple computing, the people who sell you your system are almost as important as the products you buy. (See the accompanying sidebar, "Apple Dealers: Caught in the Middle of the Network?") But, according to Lavona Rann, that doesn't have to be a problem. Rann says she plans to include dealers in her group's business user's conference. Dubbed Phase III, the meeting will be held October 2–4, 1987, in Woodfield, Illinois, a suburb of Chicago, and will highlight the professional and business use of Apples. It will feature manufacturers, representatives from Apple, and dealers. Bob Lissner, author of AppleWorks, will be a featured speaker.

Are users selling out? On the contrary. Opening up the lines of communication benefits both dealers and customers—it's the key to satisfactory service and support. Users and dealers in partnership make Apple computing effective and enjoyable.■

Lindsay Yarnall McGrath is a free-lance writer whose work has appeared in InfoWorld, Micro Marketworld, *and a variety of other computer and general-interest publications. Write to her at 1232 Date Street, Montara, CA 94037.*

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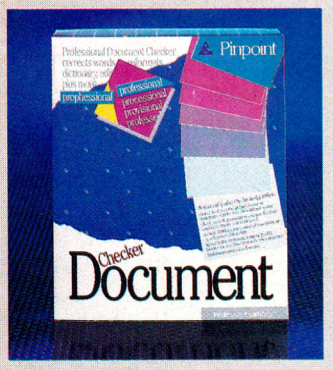

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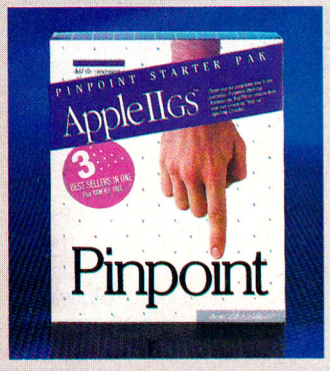

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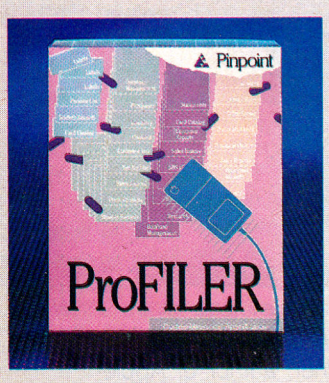

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The GS in Education:

Looking Into The Future

What can the GS offer students and teachers? inCider *goes to school to report on the latest in Apple education.*

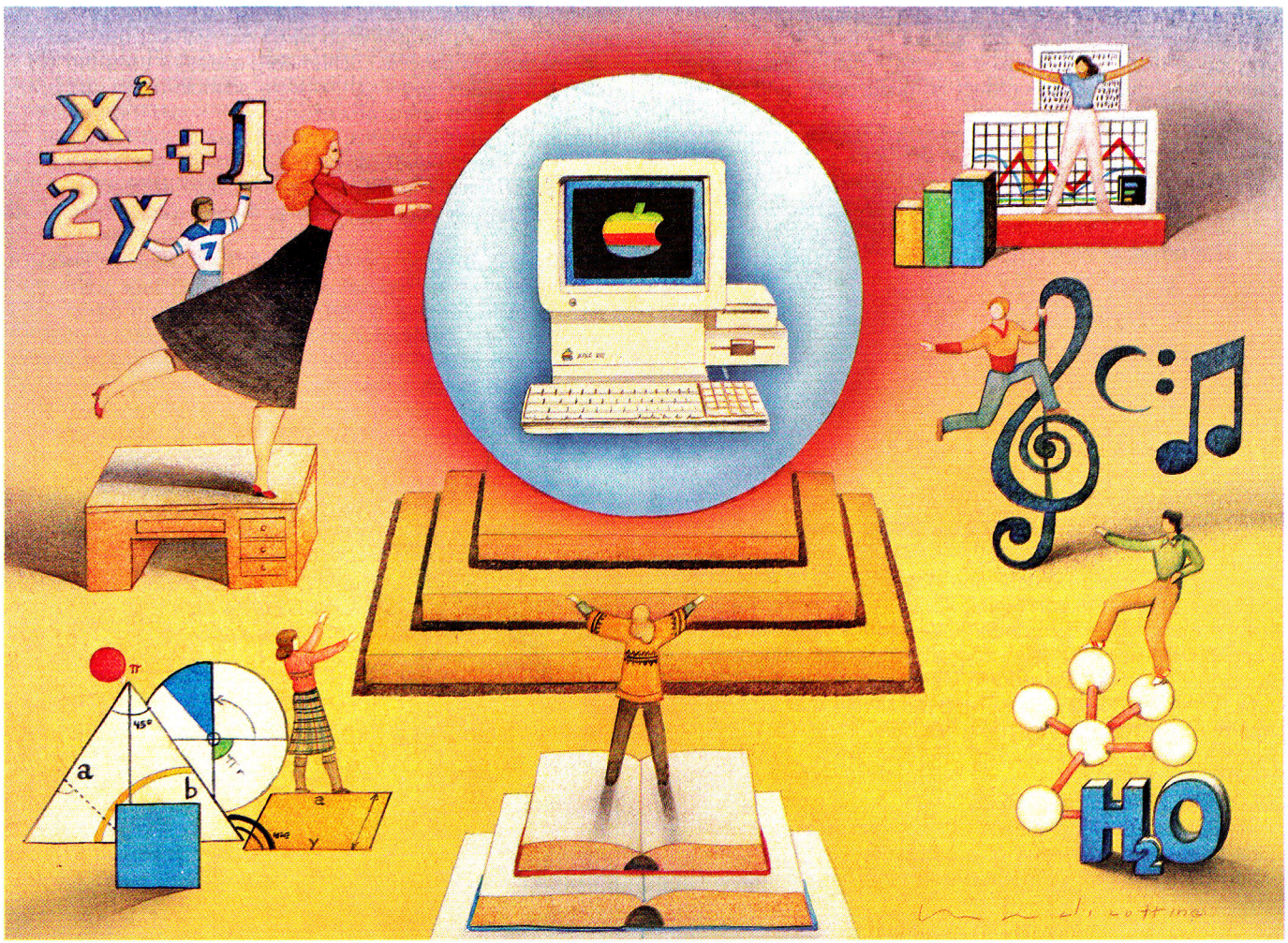
by Lafe Low, Assistant Editor, and Eric Grevstad, Review Editor

If the Apple IIGS' presence in America's schoolrooms were analyzed in math class, you might see a graph climbing steadily upward, though a graph of original expectations would be higher. If the GS' educational role were discussed in biology class, it might illustrate the question, "Which came first, the chicken or the egg?" A year after its introduction, the IIGS is finding a place in more and more schools. But teachers who have GS systems are waiting for more educational software that uses the new machine's capabilities, while software publishers are waiting for more GS school sales.

INCREASING ATTENDANCE

inCider surveyed several school districts and software companies in June, a month or two before Apple started its big third- and fourth-quarter GS marketing push. (See "The GS: Now Selling" in this issue's News Line, p. 16.) Even so, the consensus is that the GS is getting into a growing, although not skyrocketing, number of schools.

Philip Brody, director of technology development for the St. Louis, Missouri, public schools, purchased 267 GS systems for his district last year. He'd already prepared an order for that number of Apple IIes, but when the com-



pany introduced the GS, he changed his plans. "It's the future," he says of the new Apple, "not the past."

Other major school systems have placed similar orders for GSs. The New Haven Unified School District in Union City, California, has received approximately 330 new computers for 11 schools. "We got a lot of the first IIGSs," notes Rob Schamberg, district coordinator of educational technology. He received his first machines last December.

Software companies are keeping a close watch on GS sales. Kathleen Hurley, vice president of Mindscape Inc.'s educational division, reports, "The representatives we talk to say it's not taking off as fast as [Apple might] like, but the reports I'm getting back from the field are that schools are getting it. I think there are pockets of school districts that are buying a lot of GSs, but they seem to be some of the more advanced districts, people who had Mac labs and videodiscs and are looking at CD-ROMs, those kinds of things."

Tom Snyder, president of Tom Snyder Productions, sees a different audience: "There are schools that have three- or four-year-old II Pluses or IIes and are getting a GS at upgrade time."

Even with the discounts Apple, like other manufacturers, offers educators, two GSs cost about as much as three IIes. According to Apple's April 15, 1987, educational price list, a GS bundle with 512K, 5¼- and 3½-inch disk drives, and an RGB monitor costs $1405 (less for volume purchases), compared with $960 or less for a IIe with one 5¼-inch drive and a color composite monitor. Nevertheless, when *inCider* played devil's advocate and asked whether the GS' higher price was to blame for its slow start, software publishers disagreed.

Judi Bliss, president of MindPlay, notes that price may be a reason the GS "so far has been going into the administration side as opposed to the classroom side," but says a more basic reason is that administrative offices are "where things usually get into schools. I think schools are very conservative and it takes a while for an institution to switch over, even if the product is much better and will in the long run provide much more for a school."

"There are definite niche areas the GS is really better equipped for."



Judi Bliss, MindPlay

Hurley agrees: "I don't think it's the price point; I think teachers are still really comfortable with the Apple II and keep buying IIs. Education doesn't move fast; educators traditionally are not the people who jump on something new. I think we always kind of overestimate that and think that they're going to buy really fast, and they don't. It takes a while."

OLD PROGRAMS, NEW USES

Regardless of price, claims Richard Jacks, president of First Byte Inc., "the value of a computer system is provided by software." Compared with other new computers, such as the 1984 Macintosh or 1985 Amiga, of course, the IIGS earns its keep running Apple II programs. Today's GS-owning educators divide their time between creating applications with 8-bit programs and waiting impatiently for the next step in software.

Edward Radanovich, head of South High School's computer department in Omaha, Nebraska, explains, "Planning for the future was the biggest thing. We think that with the added capabilities of the IIGS, there will be a lot of sound and graphics software, and we wanted to be prepared for that." Meanwhile, he reports, his district owns about 450 Apple software titles as "something to use right away."

Rob Schamberg was "looking at the growth potential down the road" when he ordered GSs for his school district. Although Union City, unlike most systems sticking with the II line, doesn't have a large base of Apple IIs, Schamberg says the schools "didn't want to start a new program with an old machine. It's an investment for the future."

"We're using them as IIes now," Schamberg admits. "If you took a snapshot of what we're doing today, you'd say, 'Why didn't they get IIes?' Take a snapshot in two years and you'll see why."

Until that day, teachers are still finding the GS a helpful machine in education. It's succeeding with a variety of age groups in all sorts of settings and curricula. "The good thing about the GS," Radanovich observes, "is that it doesn't necessarily have a niche [in education]. Anyone who wants to use it can."

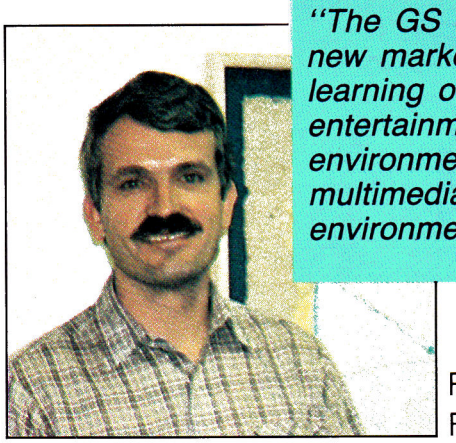
That's the way it has to be in most school districts, where budget dollars are stretched as far as they can go. "If [the computer] isn't being used for one thing, it better be used for something else, as it's a limited resource," Schamberg remarks. "[For a computer to be] utilized efficiently, all classes have to be able to use it. We had to choose the most flexible machine."

In elementary schools, Schamberg's district uses the GS for language arts and math. Middle schools use it primarily for typing and word processing, with some instruction in math and language arts; high schools in the New Haven Unified area have just begun using GS systems, running predominantly MECC software, mainly in special education and in computer labs at the alternative high school.

Students love using the IIGS, Schamberg reports. He's replaced all manual typewriters in the typing labs with GSs; he observes that although "typing used to be a course you got dumped into if you couldn't get the course you wanted," the change to keyboarding lets kids see a reason to learn the skill.

Brody's use of the GS in St. Louis is more focused. According to Brody, the GS' strengths lie in the middle

"The GS opens up a new market: A learning or entertainment environment is a multimedia environment."



Richard Jacks, First Byte

and elementary schools: He says he'll use them mostly in grades 6–8, with the primary emphasis on language arts, reading, writing, and word processing. High schools will use the machines in math classes, particularly for solving word problems.

A pilot elementary school in Brody's district is testing educational software in its computer labs. "We set up one lab site to see how the kids work with [the GS and to] see what it's like in a lab setting," he says. St. Louis plans to establish 17 such labs this school year.

Dr. Glenn Kessler, supervisor of instructional computing and educational technology for the Prince William County Public Schools in Manassas, Virginia, bought GSs mainly for use in high-school and middle-school science and with gifted and talented students. He says he'd like to see the GS used for subjects "not traditionally attributed to computer use—I'm most excited about music."

Kessler's district also developed a plan for art teachers to design parts of their courses around the GS: "The potential we see with the GS is providing us with enough of a tool-based format for developing an art curriculum," he says. "What we're seeing now is a trend in software production toward tools, not canned CAI [computer-aided instruction] software. Drill-and-practice can teach a concept, but a tool [is something] they can use forever."

Brody agrees: "I'd like to see things that take advantage of the capabilities [of the GS]. We need a new way of looking at software. We need people to break loose from what they've been doing in the past."

WAITING FOR CUSTOMERS

While teachers look for software, software vendors are looking for buyers. A few GS educational products were available at press time: Great Wave Software's pioneering pair of child's games, **KidsTime II**; the talking version of The Learning Company's **Reader Rabbit**; and three talking titles from First Byte (**MathTalk**, **First Shapes**, and **Mad Libs**, sold through Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, 415-571-7171). In the "coming soon" category were five more from First Byte and a lone program for older students (Broderbund's GS version of the Macintosh tutorial Geometry). In the "coming later" or "keeping an eye on it" class was nearly every educational publisher you can name.

To put it bluntly, no publisher wants to invest programming and marketing money in a machine whose audience is too small to pay back the investment. According to MindPlay's Bliss, "The GS has a lot of strengths, but we need a bigger base before we can develop for it. I think it's standard [for all new computers]; it takes two or three years to get your base up there to a million units, which is what we can develop for as an exclusive title."

Mindscape's Hurley agrees: "I think Apple's trying its best to help publishers see it's a really good machine, but I don't see a lot of companies I work with doing GS software. I don't see a whole lot of new-software development, period. A lot of decisions about products are going to be made after the June-July-August purchasing season for schools, so I don't think there'll be much [software] out 'til January. When we're doing our projections for next year, if we don't know there are GSs out there, we're not going to develop GS software."

Lest that sound too negative, Hurley adds, Mindscape is releasing GS versions of **Principal's Assistant** and a second program to be selected from its 177-title Apple library. If the GS seems slow now, she notes, so were other systems a while ago: "Publishers are seeing a great increase in their MS-DOS sales. We're seeing the Mac moving now, and that took a couple of years to take hold. I think it'll take another year or two for teachers to see the benefits of [the GS], and I think then they'll buy into it."

"For developers, the GS is very exciting. Now we can give people what they want."



Mary Cron, First Byte

LIKES AND DISLIKES

Some manufacturers are more excited about the IIGS than others. Jan Davidson, president of Davidson & Associates, says, "I hope it does take off in a big way," but until then her company is in a "wait-and-see mode." As for the GS' extra abilities, Davidson is unenthusiastic: "It's a few more colors and a little more sound—that's all we'd be adding. I want to put speech into educational software more than anyone else in the industry, but GS speech is not that good. We were early adopters of speech with Word Attack on the Macintosh, but Mac speech is good and clear [compared to the GS']."

Tom Snyder, who sees the idea of a computer on every student's desk as an unrealistic diversion from the real goal of helping teachers do a better job, said the GS' features are "overplayed as being useful. I was out at Apple and I heard Jean-Louis Gassée talking about how excited he was about the sound capabilities for schools, and I said, 'Give me a break. We haven't even learned how to use an Apple I in schools, let alone speech.' "

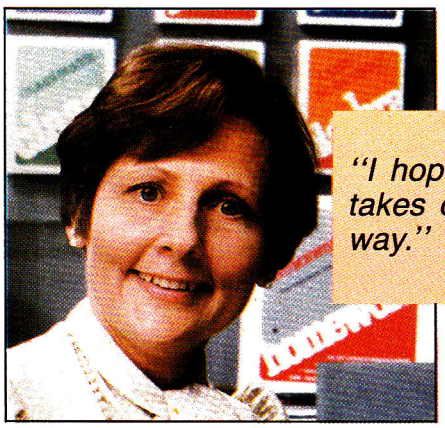
To Snyder, the GS' strengths are "more storage and more memory," turning the computer into "a serious no-nonsense workstation for the teacher. That excites me. The added graphics and sound are great for the consumer market and maybe for some very particular tutorial jobs in schools, but as far as that being the reason the GS is appropriate for classrooms, that's nonsense."

Mary Cron, First Byte's vice president for software design, disagrees. Although the GS "is not the quickest thing in the world," she says, "for developers it's very exciting. The added memory and desktop interface make it much easier to deal with; the graphics are great; and the sound capabilities, I think, add another dimension to educational software that has been sort of relegated to beeps and whistles before. All together, it'll end up supporting software that is much richer and more multidimensional. Lots of times, teachers tell us, 'I want this, this, and this,' and I have to say, 'You want it on an Apple IIe with 64K?' Now we can give people what they want."

MindPlay's Bliss takes a more intermediate course: "We're kind of straddling the fence. We'll have two products in our January catalog that use the sound on the GS, but not all the other features, so [the same program] will also work on the Apple IIs. I think the case with software development and hardware sales is always a chicken-and-egg thing, but with the GS it gives us a [compromise] path we didn't have with the Mac; you can take advantage of sound without having to come up with a completely new version."

As for software companies' GS plans, First Byte's Jacks sees the machine as "opening up a new market, [the realization] that a learning or entertainment environment is a multimedia environment." Bliss echoes the majority in mentioning speech instead of speed or graphics: "There are definite niche areas the GS is really better equipped for. One is preschool and early-grades speech, and it's needed—it really will help kids."

Mindscape's Hurley sums it up: "I think now people are looking at it for language-arts classes and speech, and I think school administrators are looking at it. I just think Apple has to do a better job of convincing teachers that this machine is better than what they already have, and that's a big job. You know teachers; it takes them three years to decide on anything. They get comfortable with what they have, they like what they have, and they keep buying that until someone convinces them there's a good reason not to do that anymore."■



"I hope the GS takes off in a big way."

Jan Davidson,
Davidson & Associates

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Mad Libs, $19.95
MathTalk, $49.95
First Byte
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#302
Long Beach, CA 90806
(213) 595-7006

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KidsTime II
Great Wave Software
5353 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-1990
$39.95

Reader Service Number 328

Principal's Assistant
Mindscape Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
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by Cynthia E. Field

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Besides the national 800 number (and, where appropriate, an in-state 800 number), a regular toll number is also included. You'll pay the customary rates, but you might find it easier to get through to a company whose toll-free line is continually busy. The list also includes mailing addresses and a product category.

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If your favorite company and its toll-free number aren't listed, write to me (10 Border Avenue, Wakefield, R.I. 02879) and include the appropriate information. I'll collect your suggestions and prepare an update for publication in a future issue of *inCider*.■

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(408) 988-0258
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(408) 973-2222
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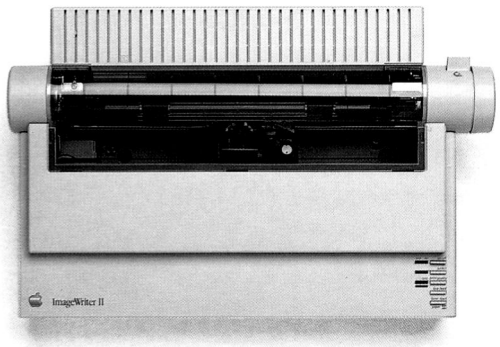

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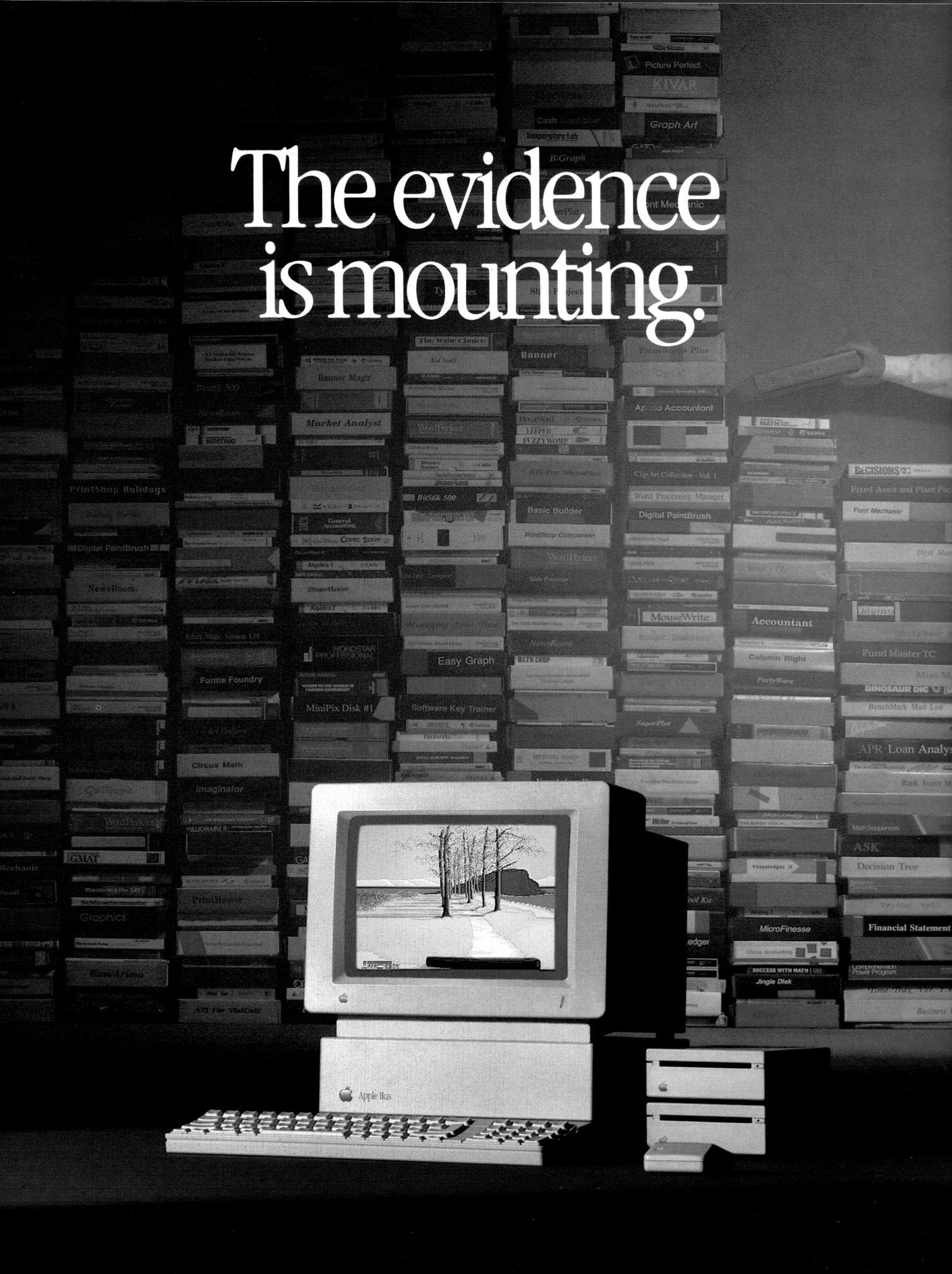
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Using Your Electronic Checkbook

Practice using the checkbook spreadsheet you created last month, and learn more about AppleWorks' IF function.



by Ruth K. Witkin

In last month's AppleWorks in Action ("Creating an Electronic Checkbook," August 1987, p. 64), you designed a powerful spreadsheet template that keeps a running balance, totals your checks and deposits, and reconciles your numbers with your bank statement. This month, you'll find out how to put the checkbook through its paces. If you haven't created the checkbook yet, now is a good time to do it.

The checkbook's tough to top, but it's followed by something really special—a demonstration of my favorite spreadsheet tool, the versatile IF function.

USING THE ELECTRONIC CHECKBOOK

First, use the AppleWorks Startup and Program disks to load the file named CHECKBOOK. Now let's pick up where we left off. You've finished reconciling your checkbook with the August bank statement. Everything checks out perfectly and you have a hardcopy for your records. Let's practice with it and see what happens when you start a new month, in this case, September. **Figure 1** shows how the checkbook looks when you're finished.

You want to total the checks and deposits in the September cells, so copy the formulas from the August cells: Place your cursor on J50. Press OA-C and hit the return key to confirm *Within worksheet*. Press the right arrow key to highlight J50 and K50, the source, then press the return key. Press the down arrow key to move the cursor to J51, the destination, and press the return key again.

AppleWorks highlights E28 on the entry line and asks whether it's *No change* or *Relative*. The formulas work with the same cells each period—checks in E7 to E29 and deposits in G7 to G29. Therefore, each cell reference is *No change*. Press the return key four times. You now have matching numbers in August and September.

When you blank out the August entries, the formulas in J50 and K50 have nothing with which to work, and the totals become zero. You want a record of total checks and deposits in August, so overtype the formulas with the numbers they generated: Leave your cursor on J50 and type **2829.84**. Move your cursor to K50, wait for recalculation to stop, type **2972.88**, and press the return key.

Now refer to the previous period on your hardcopy for a check or deposit with a tick mark (a number 1) beside it, indicating an item accounted for on the bank statement. This month, you have only the phone bill in row 34. Blank it out: Place your cursor on A34. Press OA-B to bring up the Blank screen. Type **B** to select *Block*. Press OA-right arrow to highlight A34 to I34 and press the return key. AppleWorks warns that you're about to clear protected cells (because of empty cell I34, which was included in the formula group for convenience). Go ahead and type **Y**.

Refer to the current period on your hardcopy for items without a tick mark beside them—the checks in rows 18 and 19 and the deposit in row 21. First, copy the Abner Supermarket entries to the previous period: Place your cursor on A18 and press OA-C. Press the return key to confirm *Within worksheet*. Press OA-right arrow, then the left arrow to highlight A18 to H18, the source, and hit the return key. Press OA-6, then the up arrow twice to move the cursor to A34, the destination, and hit the return key again.

Next, copy the inCider Magazine entries to the previous period: Place your cursor on A19, press OA-C, and press the return key. Press OA-right arrow, then the left arrow, and hit Return again. Press OA-6, then the up arrow key to move the cursor to A35, and press Return.

Now for the deposit: Place your cursor on A21, press OA-C, and press the return key. Press OA-right arrow, then the left arrow, then the return key again. Press OA-6 to jump the cursor to A36 and press Return. All the currently outstanding items are now safe and secure in the Previous Period Outstanding section.

You want to start fresh in the current period, so the next step is to blank out the old items: Press OA-2

Figure 1. Electronic checkbook ready for new entries.

```
======A======B====C==========D==============E=====F======G=====H======I=========J========K=====
 1| Account 42-A-3955                    ELECTRONIC CHECKBOOK
 2| ================================================================================================
 3| CURRENT PERIOD TRANSACTIONS              Check       Deposit                  *** Outstanding ***
 4| Date  Check#  Issued To                  Amount  C   Amount  D   Balance      Check     Deposit
 5| ------------------------------------------------------------------------------------------------
 6| 1987          OPENING BALANCE---------------------------------->  1,580.82
 7|                                                                    1,580.82     0.00      0.00
 8|                                                                    1,580.82     0.00      0.00
 9|                                                                    1,580.82     0.00      0.00
10|                                                                    1,580.82     0.00      0.00
11|                                                                    1,580.82     0.00      0.00
12|                                                                    1,580.82     0.00      0.00
13|                                                                    1,580.82     0.00      0.00
14|                                                                    1,580.82     0.00      0.00
15|                                                                    1,580.82     0.00      0.00
16|                                                                    1,580.82     0.00      0.00
17|                                                                    1,580.82     0.00      0.00
18|                                                                    1,580.82     0.00      0.00
19|                                                                    1,580.82     0.00      0.00
20|                                                                    1,580.82     0.00      0.00
21|                                                                    1,580.82     0.00      0.00
22|                                                                    1,580.82     0.00      0.00
23|                                                                    1,580.82     0.00      0.00
24|                                                                    1,580.82     0.00      0.00
25|                                                                    1,580.82     0.00      0.00
26|                                                                    1,580.82     0.00      0.00
27|                                                                    1,580.82     0.00      0.00
28|                                                                    1,580.82     0.00      0.00
29|               CLOSING BALANCE------------------------------------>  1,580.82
30| ================================================================================================
31| PREVIOUS PERIOD OUTSTANDING              Check   C   Deposit  D                  Check     Deposit
32| ------------------------------------------------------------------------------------------------
33| Jul 23   412   Country Printers           15.00                                 15.00      0.00
34| Aug 27   431   Abner Supermarket          96.23                                 96.23      0.00
35| Aug 27   432   inCider Magazine          38.00                                 38.00      0.00
36| Sep 3          Deposit                                 25.00                    0.00     25.00
37|                                                                                 0.00      0.00
38|                                                                                 0.00      0.00
39|                                                                                 0.00      0.00
40| ================================================================================================
41| RECONCILIATION                                                  Y-T-D        CHECKS    DEPOSITS
42| ----------------------------------------------                  ------------------------------
43| Checkbook Closing Balance:          1,580.82                    January     2,376.44  2,570.00
44|  Plus bank credits                                              February    1,234.78  2,134.00
45|  Less bank charges                                              March       2,256.23  1,980.00
46|                                     ---------                   April       2,789.50  1,878.90
47| Adjusted Checkbook Balance          1,580.82                    May         1,987.00  2,476.00
48|                                                                 June        2,133.00  2,903.00
49| Bank Statement Balance:                                         July        2,345.67  3,076.01
50|  Plus deposits in transit             25.00                     August      2,829.84  2,972.88
51|  Less outstanding checks             149.23                     September       0.00      0.00
52|                                     ---------                   October
53| Adjusted Bank Statement Balance      (124.23)                   November
54| Variance (Checkbook minus Statement) 1,705.05                   December
55| Maximum Balance During Month        1,580.82                                ---------  ---------
56| Average Balance During Month        1,580.82                    Totals     17,952.46  19,790.79
57| ================================================================================================
```

to jump to row 8 and place your cursor on A7. Press OA-B to bring up the Blank screen. Type **B** to select *Block*. Press OA-4, OA-right arrow, then the left arrow to highlight the block to column H, and press the return key.

Now blank out the opening balance: Place your cursor on I6, press OA-B, and press Return. The formulas now show zeros. Next, blank out the credits and charges in the Reconciliation section: Press OA-7 to jump to row 43. Place your cursor on E44 and press OA-B. Type **B**, press the down arrow key, and press Return. And finally, blank out the bank-statement balance: Place your cursor on E49, press OA-B, and press Return. You now have a clean spreadsheet with all the formulas ready and waiting to calculate your new entries.

Most of the blanked cells are in standard format (commas with two decimal places), which means they're unaffected by blanking. Cells with a nonstandard format, however, lose their format when blanked. Therefore, cells containing check numbers in column B and tick marks in columns F and H need to be reformatted for *Appropriate*. Press OA-2 to jump to row 8 and place your cursor on A7. Press OA-L to bring up the Layout screen. Type **B** to select *Block*. Press OA-4, OA-right arrow, then the left arrow key to highlight the block, and press the return key. Press the return key again to confirm *Value format* and type **A** to select *Appropriate*.

Now reformat the cells in column F for *Appropriate*: Place your cursor on F7 and press OA-L. Type **B** and press OA-4. Press the return key twice and type **A**. The last group of cells is in column H: Place your cursor on H7 and press OA-L. Type **B** and press OA-4. Press Return twice and type **A**. You can avoid the blanking and reformatting steps by overtyping the old entries, but that's risky. If you overlook a number, you'll spend more time trying to figure out why your checkbook won't balance.

Start the new period where the last one left off: Place the cursor on I6, type **1580.82** (the previous month's closing balance), and press the return key. When recalculation stops, press OA-K to recalculate a second time. You're now ready for the next period.

It's a good idea to enter your checks and deposits as they happen—not in a bunch when you feel up to it—so that your running balance is always current. Then, when you receive the bank statement, tick off the transactions by typing a 1 in columns F and H next to the item. In the Reconciliation section, type in the bank service charges, credits, and bank-statement balance. Remember to recalculate a second time—and stand back!

EXPLORING THE IF FUNCTION

High on my list of favorite things is the IF function—that nifty built-in routine that lets a formula choose the right answer for you. When I was first learning about spreadsheets, the IF function was a real mystery. In my struggle to master it, I discovered a multifaceted gem that has helped me turn many a complex spreadsheet concept into reality. If IF is still a mystery to you, here's how to break the code.

The IF function is known as a *conditional* function because it establishes a test condition that can be either true or false. True means the test is met, false means the test fails.

Let's say you're planning your weekend. You say to yourself, "If the temperature is in the 80s, I'll go to the beach. Else, I'll stay home and read." You've just set a test condition and two alternate actions. In spreadsheet terms, the first alternate is called the *Then* statement; the second alternate is the *Else* statement.

Your action depends on the test result. If the test is true (the temperature is at least 80 degrees), you heed the Then statement and go to the beach. If the test is false (the temperature is below 80 degrees), you heed the Else statement and stay home.

This concept in the form of an AppleWorks formula looks like

@IF(Temperature>=80,Go To Beach, Stay Home)

The IF formula begins with *@IF* followed by an open parenthesis, and ends with a closed parenthesis. The

parentheses enclose the Test, Then, and Else statements, separated by commas. The Test statement contains one of six symbols known as *comparison operators*: < (less than), > (greater than), = (equal to), <= (less than or equal to), >= (greater than or equal to), and <> (not equal to).

The Test statement compares only values, either a number in a cell or a number you type into the formula. For example, @IF(B7<100 compares the number in B7 to see whether it's less than 100. You can compare the contents of two cells, such as @IF(B7>C14, or the results of calculations, such as @IF(B7 + D19 = G22/J4. Similarly, the Then and Else statements can be numbers in cells, numbers you provide, or calculations. There are no spaces in an IF formula.

Figure 2 shows a spreadsheet that calculates a sales bonus. A company pays a 5 percent bonus for sales over $5000, no bonus for anything less. Therefore, you need a formula to distinguish between salespeople who are eligible for the bonus and those who aren't. The formula, entered in C3, is

@IF(B3>5000,.05*(B3 – 5000),0)

The elements of the formula are

Test statement: @IF(B3>5000,
Then statement: .05*(B3 – 5000),
Else statement: 0)

The Test statement looks at B3, which contains more than $5000. The Test is true, so the Then statement calculates 5 percent of the remainder after subtracting $5000 from $9500 (the amount in B3) and enters the result in C3.

When you copy the formula into C4, C5, and C6, it works with the other sales amounts the same way. The formula in C4 finds an amount less than $5000 in B4, so the Else statement enters a zero. The formula in C5 finds $7275, so the Then statement calculates 5 percent of the amount over $5000. The formula in C6 finds $5000, and the Else statement enters a zero.

Sometimes you need an IF formula that satisfies more than two conditions. This situation calls for a *nested IF* formula which, as its name implies, is one IF formula nested in another.

Figure 3 shows a spreadsheet for a heating-oil distributor whose customer rate is determined by usage during the billing period. A customer who uses less than 100 gallons pays a rate of $1.22 per gallon; a customer who uses 250 gallons or more pays $1.09 per gallon; and a customer who uses between 100 and 250 gallons pays $1.16 per gallon. This is a situation with three possible results.

Figure 2. IF formula that calculates a sales bonus.

	A	B	C
1	EMPLOYEE	SALES	BONUS
2			
3	D Johnson	$9,500	$225.00
4	E Flynn	$4,450	$0.00
5	A Einstein	$7,275	$113.75
6	L Jourdan	$5,000	$0.00
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			

C3: (Value) @IF(B3>5000,.05*(B3-5000),0)

The formula in D3 is

@IF(B3<100,B3*1.22,@IF(B3>=250,
B3*1.09,B3*1.16))

The elements of the formula are

Test statement: @IF(B3<100,
Then statement: B3*1.22,
Else statement (nested IF):
@IF(B3>=250,B3*1.09,B3*1.16))
  Nested Test statement: @IF(B3>=250,
  Nested Then statement: B3*1.09,
  Nested Else statement: B3*1.16))

- The Test statement in the first IF formula looks at B3, which contains the number of gallons the customer used. If the number is less than 100, the test is true, and the Then statement multiplies the amount in B3 by $1.22.
- If the number in B3 is greater than or equal to 100, the test is false, and the formula evaluates the Else statement.
- The Else statement is the nested IF formula. This Test statement also looks at the number of gallons in B3. If the number is greater than or equal to 100, the test is true, and the Then statement multiplies the amount in B3 by $1.09.
- If the number in B3 is less than 250, the test is false, and the Else statement multiplies the number of gallons in B3 by $1.16.

Copied into the other cells in column D, the formula works with the amount for each customer the same way.

The IF function is one of the tools that gives a spreadsheet real power. We'll explore other built-in functions as space permits. Next month, it's database time again, and you'll find out how to organize the numbers that clutter your life.■

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

Figure 3. Nested IF formula that selects one of three answers.

	A	B	C	D	E	F	G
1	CUSTOMER	GALLONS		BILLING			
2							
3	Bob Nelson	88		$107.36			
4	Michael Aven	275		$299.75			
5	Karen A. David	136		$157.76			
6	Burt E. Byrd	105		$121.80			
7	Jeff Wennerstrom	65		$79.30			
8	Don England	321		$349.89			
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

D3: (Value, Layout-D2) @IF(B3<100,B3*1.22,@IF(B3>=250,B3*1.09,B3*1.16))

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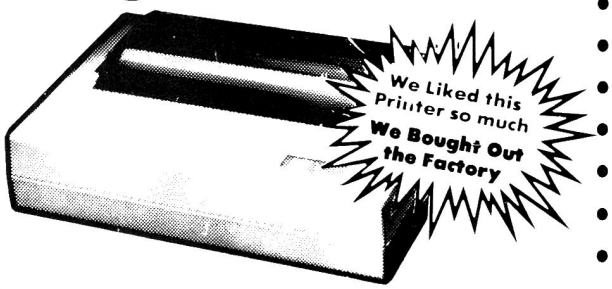

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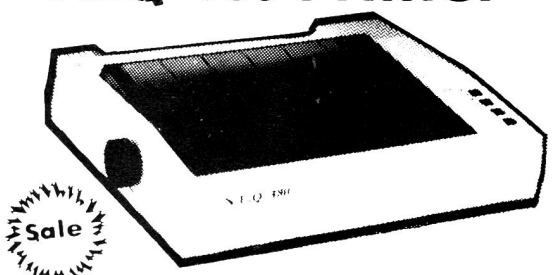

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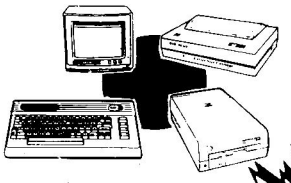

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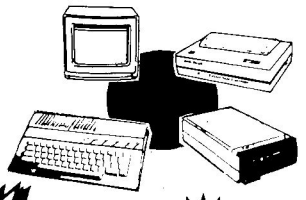

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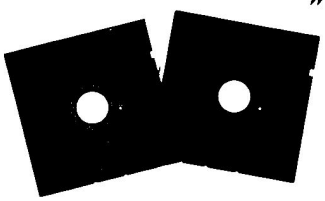

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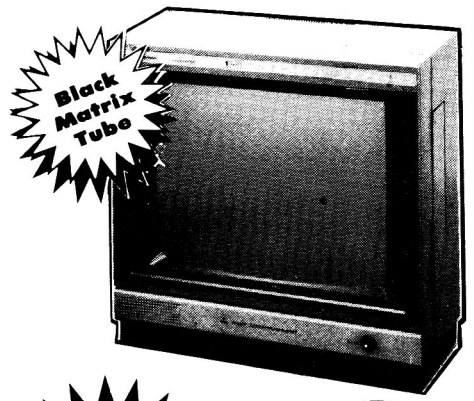

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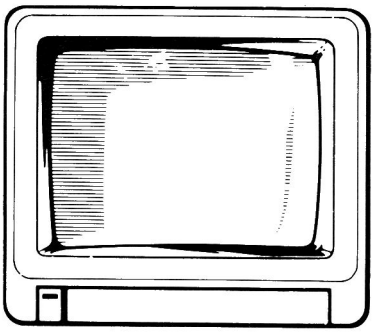

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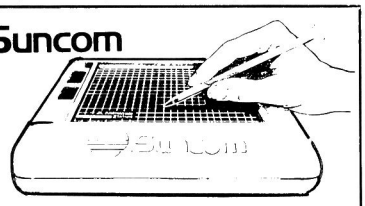

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Calorie Burner

Keep a daily log of your activities and the calories you burn as an aid to better health and fitness.



by Dan Bishop

Calorie Counter, a program that appeared in my February 1987 column (p. 89), lets you keep track of the calories you consume. In that program, you identify the types and quantities of food you've eaten. Judging from my mail, I must have hit on a subject of interest to a lot of readers.

This month's program deals with the reverse side of the coin. Calorie Burner (see the accompanying **Program listing**, plus a corresponding data strip on p. 134) helps you calculate the number of calories you'll burn during a given activity. The program contains an internal data list of typical activities, with the number of calories a 100-pound person burns per minute during each activity.

Since only a few of us weigh 100 pounds, the program lets you enter your sex, age, and weight at the start, and uses this information to calculate your own approximate calorie expenditure for any activity. Calorie Burner also calculates and displays your approximate basal metabolic rate (BMR), the number of calories your body uses in one day when you do nothing at all (such as watch TV).

Calorie Burner includes two interesting features. First, you can enter the number of minutes in one day you devoted (or plan to devote) to a given activity. Each activity you add to a day's list changes the total number of calories burned that day. The program lets you print your list of selected activities along with the times you entered and the calculated number of calories your body will burn for each.

Second, when the program displays a specific activity, it gives you the option of relating this activity to pounds and weight loss. When you choose this option, you enter the number of pounds you want to lose and the number of minutes each day you're willing to devote to that activity. Calorie Burner then calculates the minimum number of days you must perform that activity to lose the specified weight. The program also lets you print this report.

DISCLAIMER

Before going into detail on this program's operation, I must make its limitations clear. First, the number of calories you burn per minute in a given activity depends on more than just your weight (which is the only factor taken into account here). The temperature, the amount of clothing you wear, the shape you're in, and how actively you participate during the time period in question all enter in. Even the basal metabolic rate will differ among individuals of the same sex, age, and weight, which are the only factors this program counts.

Furthermore, the program assumes that individuals using it are at least 20 years old. The BMR for adolescents and children isn't likely to fit a simple formula like Calorie Burner's.

On the other hand, this program can help you predict the number of calories your body will burn in one day when you enter a set of activities and times that describe your day or your intended fitness regimen. It can also give you a realistic view of how long it takes to "burn off" a specified number of pounds by pursuing a given activity daily. Although this figure may discourage you at first, it can keep you from developing unrealistic expectations. And if you know how long it takes to get rid of those extra pounds, you might be more determined to stick with your regimen until you achieve your goals.

USING THE PROGRAM

When you first run Calorie Burner, the computer pauses slightly while it reads your data list. It then prompts you to indicate your sex (1 for female, 2 for male), age, and weight (no cheating, now). Calorie Burner uses this information to calculate the BMR and to properly determine the number of calories *you* will burn with each selected activity. To use the program for a second person, end it and run it again from the start, entering that person's sex, age, and weight.

Calorie Burner presents two option menus. The Master Menu (lines 700–790) pops up as soon as you've

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APPLESOFT ADVISER

Program listing. Calorie Burner.

```
1  REM     CALORIE BURNER
2  REM     CALCULATE CALORIES BURNED
3  REM     IN A DAY, INCLUDING BMR
4  REM
5  REM     *********************
6  REM      BY DAN BISHOP
7  REM      APPLESOFT ADVISOR
8  REM      INCIDER MAGAZINE-09/87
9  REM     *********************
10  READ NA: DIM AC$(NA),TP$(NA),T(NA),CB(NA),QB(NA),JX(NA)
20 L$ = "----------": READ TB$
30 L$ = "---" + L$ + L$ + L$ + L$
35 BL$ = "                                    ": REM  30 BLANK SPAC
   ES
40  GOSUB 200: REM  READ DATA
50  GOSUB 1200: GOSUB 1400: REM  GET PERSONAL DATA AND BMR
60  GOSUB 700: REM  DISPLAY MENU
70  ON M GOSUB 300,800,1100,250,90
80  GOTO 60
90  HOME : END
94  REM
95  REM
96  REM  *********************
97  REM  COMMONLY USED ROUTINES
98  REM  *********************
99  REM
100  INPUT "PRESS <RETURN> TO CONTINUE...";X$
110  HOME : RETURN
115  REM
116  REM
120  GOSUB 190
130  PRINT "ACTIVITY.............CAL/MIN MIN    TTL"
140  PRINT L$: PRINT : RETURN
145  REM
146  REM
150  GOSUB 500: PRINT PL$
160  PRINT L$
170  IF P$ = "Y" THEN  GOSUB 1500
180 P$ = "N": RETURN
190  HOME : PRINT TB$: PRINT "TOTAL CALORIES BURNED IN 1 DAY:
     ";
191 T = BR * ((24 * 60) - TM) + TB
192  PRINT  INT (T): PRINT L$: RETURN
194  REM
195  REM
196  REM  *********************
197  REM  ROUTINE TO READ DATA
198  REM  *********************
199  REM
200  READ NB
210  FOR J = 1 TO NA
220  READ AC$(J),TP$(J),CB(J)
230 JX(J) = J
240  NEXT J
250 TB = BR:TM = 0
260  FOR J = 1 TO NA
265 T(J) = 0
270 QB(J) = 0
280  NEXT J
290  RETURN
294  REM
295  REM
296  REM   *********************
297  REM  ROUTINE TO DISPLAY
298  REM  NR RECORDS AT A TIME
299  REM  ***********************
300  HOME :NU = 0:P$ = "N"
310  INPUT "DO YOU WANT RECORDS PRINTED ON PRINTER?   (Y/N):
     ";P$
320  IF P$ = "Y" THEN  GOTO 400
```

Continued on p. 105

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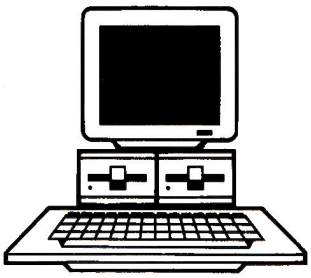

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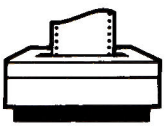

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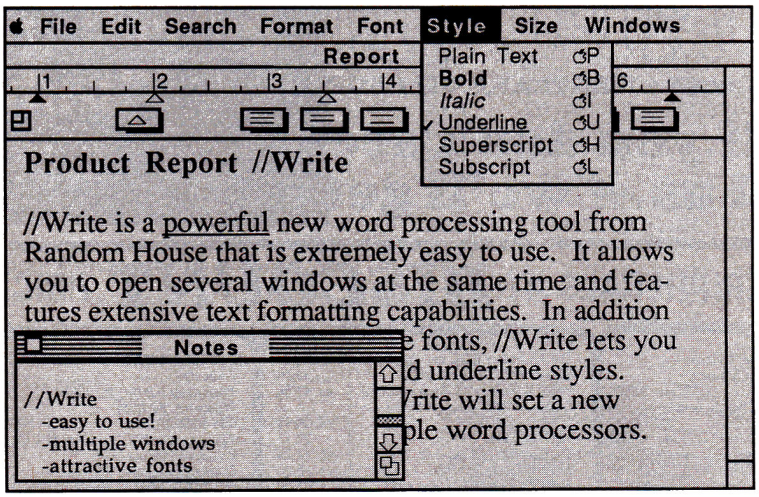

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Circle 258 on Reader Service Card.

Continued from p. 99

Listing continued.

```
330  GOSUB 120: FOR J = 1 TO NB:NU = NU + 1
340  GOSUB 150: REM  DISPLAY RECORD JX(NU)
350  IF NU = NAX THEN J = NB
351  REM  NAX AND NA ARE THE SAME
360  NEXT J
370  GOSUB 100: IF NU = NAX THEN 390
380  GOTO 330
390 P$ = "N": RETURN
393  REM
394  REM
395  REM  ********************
396  REM  PRINT ROUTINE FOR
397  REM  ENTIRE LIST
398  REM  ********************
399  REM
400  HOME : PRINT "WHAT DO YOU WANT PRINTED...": PRINT "   1.
      ENTIRE ACTIVITY LIST.": PRINT "   2. ONLY ACTIVITIES EN
     TERED IN COUNTER."
410  INPUT "    ===> ";EL: IF EL < 1 OR EL > 2 THEN 400
420  PRINT  CHR$ (4);"PR#1"
430  GOSUB 120
440  FOR J = 1 TO NA
450 NU = J
460  IF EL = 2 AND QB(JX(NU)) = 0 THEN  GOTO 480
470  GOSUB 500: PRINT PL$: PRINT L$
480  NEXT J:P$ = "N"
490  PRINT  CHR$ (4);"PR#0": RETURN
494  REM
495  REM
496  REM  ********************
497  REM  DISPLAY FORMATTER
498  REM  ********************
499  REM
500 PL = 20 -  LEN (AC$(JX(NU)))
510 PL$ = AC$(JX(NU)) + " " +  LEFT$ (TP$(JX(NU)),PL)
520 PL$ =  LEFT$ (PL$ + BL$,20)
530 PL$ = PL$ +  RIGHT$ ("       " +  STR$ (CB(JX(NU))),7): REM
      7 BLANK SPACES
540 PL$ = PL$ +  RIGHT$ ("     " +  STR$ (T(JX(NU))),5): REM
      5              BLANKS
550 PL$ = PL$ +  RIGHT$ ("       " +  STR$ ( INT (QB(JX(NU)))
    ),7): REM            7 BLANKS
560  RETURN
594  REM
595  REM  ********************
596  REM  QTY ENTRY ROUTINE
597  REM  ********************
598  REM
599  REM
600  PRINT : PRINT "ENTER THE NUMBER OF MINUTES PER DAY "
610  PRINT "TO BE LOGGED FOR THIS ACTIVITY."
620  INPUT X
630  IF T(JX(NU)) = 0 THEN  GOTO 660
640 TM = TM - T(JX(NU))
650 TB = TB - T(JX(NU)) * CB(JX(NU)) * (1 + .01 * (WT - 100))
660 TM = TM + X:T(JX(NU)) = X
670 QB(JX(NU)) = X * CB(JX(NU)) * (1 + .01 * (WT - 100))
680 TB = TB + QB(JX(NU))
690  RETURN
694  REM
695  REM
696  REM    ********************
697  REM  ROUTINE TO DISPLAY MENU
698  REM   ********************
699  REM
700  GOSUB 190
710  PRINT "ENTER THE NUMBER OF YOUR SELECTION...": PRINT
720  PRINT "     1. LIST ALL ACTIVITIES."
730  PRINT "     2. SEARCH FOR AN ACTIVITY."
740  PRINT "     3. SORT ACTIVITIES IN THE LIST."
750  PRINT "     4. RESET CALORIE COUNTER AND TIMER."
```

Listing continued.

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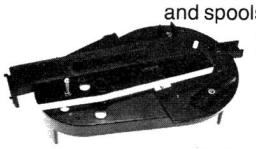

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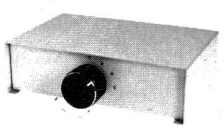

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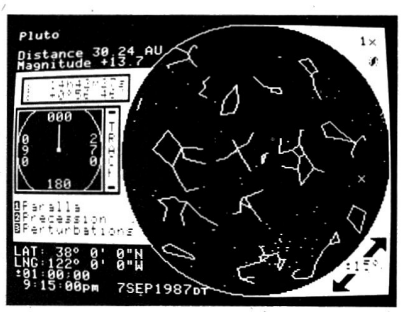

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Listing continued.

```
760  PRINT "      5. END THE PROGRAM."
770  PRINT : INPUT "  CHOICE ====> ";M$
780 M =  VAL (M$): IF M < 1 OR M > 5 THEN  PRINT "**** INVALI
     D                          CHOICE ****": PRINT : GOTO 72
     0
790  RETURN
794  REM
795  REM
796  REM  ******************
797  REM  ARRAY SEARCH ROUTINE
798  REM  ******************
799  REM
800  GOSUB 190
810  PRINT : PRINT "YOUR ACTIVITY LIST WILL BE SEARCHED"
820  PRINT "FOR ANY PARTIAL MATCH ON ACTIVITY NAME.": PRINT
830  PRINT "ENTER THE CHARACTER STRING TO BE USED"
840  PRINT "FOR THE SEARCH (OR PRESS RETURN):"
850  PRINT : INPUT "====>  ";S$
860  IF S$ = "" THEN  RETURN
870 S =  LEN (S$):NU = 0
880  GOSUB 1000
890  IF F = 0 THEN  GOTO 980
900  GOSUB 120: GOSUB 150
910  PRINT
920  PRINT "PRESS <N> FOR NEXT MATCH;"
921  PRINT "       <T> TO CHANGE TIME LOG;"
922  PRINT "       <C> TO CALC. WEIGHT LOSS;"
923  PRINT "       <P> FOR PRINTED COPY;"
924  PRINT "    <Q> TO QUIT & RETURN TO MENU ===>";
930  GET X$
940  IF X$ <  > "N" AND X$ <  > "T" AND X$ <  > "C" AND X$ <
      > "P" AND X$ <  > "Q" THEN 930
950  PRINT X$: IF X$ = "P" THEN  GOSUB 1500: GOTO 900
955  IF X$ = "Q" THEN  GOTO 995
960  IF X$ = "T" THEN  GOSUB 600: GOTO 900
965  IF X$ = "C" THEN  GOSUB 1600: GOTO 900
970  IF NU < NAX THEN  GOTO 880
980  PRINT : PRINT "NO FURTHER MATCHES FOUND."
990  GOSUB 100
995  RETURN
996  REM   ********************
997  REM    SEQUENTIAL ARRAY
998  REM    SEARCH ROUTINE
999  REM   ********************
1000 F = 0:NU = NU + 1
1005  HOME : PRINT "SEARCHING INDEX ENTRY "NU"..."
1010 L =  LEN (AC$(JX(NU)))
1020  IF S > L THEN 1090
1030 D = L - S + 1
1040  FOR J = 1 TO D
1050 D$ =  MID$ (AC$(JX(NU)),J,S)
1060  IF D$ = S$ THEN J = D + 10:F = 1
1070  NEXT J
1080  IF J >  = D + 10 THEN  GOTO 1095
1090  IF NU < NAX THEN  GOTO 1000
1095  RETURN
1096  REM  *****************
1097  REM   SORT INDEX BY
1098  REM    ACTIVITY NAME
1099  REM  *****************
1100  GOSUB 1300
1110  FOR J = 1 TO NU
1120  IF AC$(JX(J)) > AC$(JX(NXT)) THEN K = J:J = NU + 10
1130  NEXT J
1140  GOSUB 1330
1150  IF NXT <  = NAX THEN  GOTO 1110
1160  RETURN
1196  REM    ******************
1197  REM     INITIAL ENTRY OF
1198  REM     PERSONAL DATA
1199  REM    ******************
```

Listing continued.

Listing continued.

```
1200  HOME : PRINT "TO CALCULATE BASAL METABOLISM RATE"
1210  PRINT "YOU MUST ENTER YOUR SEX, AGE & WEIGHT."
1220  PRINT
1230  PRINT "FOR SEX, PLEASE ENTER:  1 FOR FEMALE;"
1240  PRINT "                        2 FOR MALE;"
1250  INPUT SX: IF SX < 1 OR SX > 2 THEN  GOTO 1220
1260  PRINT : INPUT "PLEASE ENTER YOUR AGE: ";AG
1270  PRINT : INPUT "NOW ENTER YOUR WEIGHT (IN POUNDS): ";WT
1280  RETURN
1296  REM   ********************
1297  REM    GENERAL ROUTINES
1298  REM    USED BY SORT
1299  REM   ********************
1300  HOME : PRINT "SORTING RECORDS."
1310  PRINT "  PLEASE WAIT..."
1320 NU = 1:NXT = 2: RETURN
1330  IF J < NU + 10 THEN  GOTO 1390
1340 XX = JX(NXT)
1350  FOR J = NXT TO K + 1 STEP  - 1
1360 JX(J) = JX(J - 1)
1370  NEXT J
1380 JX(K) = XX
1390 NU = NU + 1:NXT = NXT + 1
1395  RETURN
1396  REM   ********************
1397  REM   BMR CALCULATION
1398  REM   ********************
1399  REM
1400 BR = WT * (10 + SX)
1410 BR = BR - .02 * BR *  INT ((AGE - 20) / 10 + .5)
1420  PRINT : PRINT "**************************************"
1430  PRINT " YOUR BASAL METABOLISM RATE IS ABOUT:"
1440  PRINT "           " INT (BR)" CAL/DAY."
1450  PRINT "**************************************"
1460  GOSUB 100
1470 BR = BR / (24 * 60)
1480  RETURN
1494  REM
1495  REM
1496  REM  ******************
1497  REM  PRINT-OUT ROUTINE
1498  REM  ******************
1499  REM
1500  PRINT  CHR$ (4);"PR#1"
1510  GOSUB 120
1520  GOSUB 500: PRINT PL$
1550  PRINT L$
1560  PRINT
1570  PRINT  CHR$ (4);"PR#0"
1580  RETURN
1590  REM   ***********************
1591  REM   DATA ENTRY OF WT LOSS
1592  REM   DESIRED AND TIME TO
1593  REM   DEVOTE TO ACTIVITY.
1594  REM   ***********************
1600  IF CB(JX(NU)) = 0 GOTO 1690
1610  PRINT : INPUT "HOW MANY POUNDS DO YOU WANT TO LOSE? ";W
    L
1620  PRINT "HOW MANY MINUTES PER DAY WILL YOU"
1630  PRINT "DEVOTE TO "AC$(JX(NU));
1640  INPUT WM: IF WM = 0 GOTO 1690
1650  GOSUB 1830
1660  INPUT "DO YOU WANT THIS PRINTED (Y/N)...";P$
1670  IF P$ = "Y" THEN  GOSUB 1800
1690 P$ = "N": RETURN
1790  REM   ***********************
1791  REM   ROUTINE TO PRINT DATA
1792  REM   RELATING WT LOSS TO
1793  REM   TIME REQUIRED FOR A
1794  REM   GIVEN ACTIVITY.
1795  REM   ***********************
```

Listing continued.

entered the personal data and offers five options:

1. LIST ALL ACTIVITIES
2. SEARCH FOR AN ACTIVITY
3. SORT ACTIVITIES IN THE LIST
4. RESET CALORIE COUNTER AND TIMER
5. END THE PROGRAM

This menu reappears whenever the program completes one of the first four options.

After you select option 1 (list all activities), the program asks whether you want to print the records. Answer Y or N. If you respond N, the computer displays all activities in your data list, eight at a time (controlled by line 2000), prompting you to press the return key after each page.

If you choose to print the records, the program asks whether you want to print the entire activities list or just those activities for which you've entered times. **Figure 1** shows how the entire list might look when printed. Note that **Figure 1** shows entered times for three activities. **Figure 2** illustrates a hardcopy for selected activities only.

To enter times and obtain calorie versus weight-loss information, select option 2 from the Master Menu. Option 2 produces the following prompt:

YOUR ACTIVITY LIST WILL BE SEARCHED FOR ANY PARTIAL MATCH ON ACTIVITY NAME. ENTER THE CHARACTER STRING TO BE USED FOR THE SEARCH (OR PRESS RETURN):

If you press Return, the program cycles back to the Master Menu. Otherwise, you can enter any portion of the activity name (the first entry in the data list), such as SK for skiing or BOWL for bowling. Of course, if your list includes SKY DIVING, entering SK will bring up sky diving as well as skiing. The computer now searches through the list and presents the first activity containing a match for the characters you entered. Below this activity is the option 2 menu:

PRESS <N> FOR NEXT MATCH;
<T> TO CHANGE TIME LOG;
<C> TO CALCULATE WEIGHT LOSS;
<P> FOR PRINTED COPY;
<Q> TO QUIT. = = =>

If the activity displayed isn't the one you're looking for, press N to continue searching through the list for the next match. If you want to enter a time (in minutes) for this activity and add it to the calorie counter, press T. The program then asks you to enter the number of minutes per day to be logged for this activity. The value you

type in replaces the old value already in this slot. When you enter a value, the program displays under TTL the approximate number of calories you'll burn during that time period, and updates your daily TOTAL CALORIES BURNED, shown at the top.

There are two important items to note here. First, the number of calories displayed under TTL isn't simply the calories per minute multiplied by the number of minutes (unless you entered 100 pounds for your weight). TTL is the approximate number of calories burned by a person with the weight you entered.

Second, TOTAL CALORIES BURNED isn't simply your BMR plus the TTL just computed. This is because TTL includes the number of calories burned at rest. So your rest BMR, in calories per minute, is multiplied by the number of minutes you entered and subtracted from TOTAL CALORIES BURNED before TTL is added. This prevents the program from adding in BMR twice.

Suboption C in the option 2 menu lets you calculate weight-loss projections. Choosing this option presents the following prompts:

HOW MANY POUNDS DO YOU WANT TO LOSE?

HOW MANY MINUTES PER DAY WILL YOU DEVOTE TO THIS ACTIVITY?

If you enter a zero for the number of minutes, the program cycles back to the option 2 menu. Otherwise, you'll get a report like the following, using the data you just entered:

900 MINUTES OF THIS ACTIVITY ARE ABOUT EQUAL TO ONE POUND. YOU WILL HAVE TO DEVOTE 30 MINUTES PER DAY FOR ABOUT 300 DAYS IN ORDER TO LOSE 10 POUNDS.

At this point, the program also gives you the option of sending this report to your printer. **Figure 3** shows an example of a printed report.

Another disclaimer needs to be made here. If your activity causes you to increase your food intake, then the time the program indicates could be much longer. You could even gain weight if you aren't careful! If you match the calories you eat (use February's Calorie Counter to find the number of calories you consume) to your BMR, however, then add activities on top of the BMR, the above report should be fairly accurate. Although it doesn't account for the 30 minutes of BMR included in the total calories burned, it's known that for several hours after a strenuous activ-

Listing continued.

```
1800  PRINT  CHR$ (4);"PR#1"
1810  PRINT L$: GOSUB 130
1820  GOSUB 500: PRINT PL$: PRINT L$
1830 MP =  INT (3500 / (CB(JX(NU)) * (1 + .01 * (WT - 100))))

1835 WD =  INT (WL * MP / WM)
1840  PRINT MP" MINUTES OF THIS ACTIVITY ARE ABOUT"
1850  PRINT "EQUAL TO 1 POUND."
1860  PRINT : PRINT "YOU WILL HAVE TO DEVOTE " INT (WM)" MINU
     TES"
1870  PRINT "PER DAY FOR ABOUT " INT (WD)" DAYS IN ORDER"
1880  PRINT "TO LOSE " INT (WL)" POUNDS."
1890  PRINT L$: PRINT  CHR$ (4);"PR#0"
1900  RETURN
1990  REM
1991  REM
1992  REM  *****************
1993  REM   DATA BASE
1994  REM  *****************
1995  REM
1996  REM
1998  DATA  53 : REM  NUMBER OF ACTIVITIES CURRENTLY IN YOUR
     DATA BASE.
1999  DATA   CALORIE BURNER
2000  DATA  8: REM  NUMBER OF ITEMS TO BE DISPLAYED AT ONE TI
     ME ON SCREEN.
2001  REM  ACTIVITIES
2002  DATA  STROLLING,"2 MPH",1.5
2003  DATA  WALKING,"3 MPH", 2.7
2004  DATA  WALKING,"4 MPH",3.9
2005  DATA  WALKING,"5 MPH",5.1
2006  DATA  CYCLING,"6 MPH",3.1
2007  DATA  CYCLING,"8 MPH",4.2
2008  DATA  CYCLING,"10 MPH",5.4
2009  DATA  CYCLING,"11 MPH",5.8
2010  DATA  CYCLING,"12 MPH",6.3
2011  DATA  CYCLING,"13 MPH",6.9
2012  DATA  RUNNING,"12 MIN.MILE",6.1
2013  DATA  RUNNING,"8 MIN.MILE",9.4
2014  DATA  RUNNING,"5 MIN.MILE",13.1
2015  DATA  SWIMMING,"BREAST STRK",4.8
2016  DATA  SWIMMING,"CRAWL",5.8
2017  DATA  CALISTHENICS,"(MANY)",3.3
2018  DATA  BALLET EXERCISES," ",3.3
2019  DATA  DANCING, FOXTROT, 3.3
2020  DATA  DANCING, FOLK, 4.5
2021  DATA  SKATING, ROLLER, 3.6
2022  DATA  SKATING, ICE, 3.6
2023  DATA  SKIING, WATER, 4.5
2024  DATA  SKIING, DOWNHILL, 6.3
2025  DATA  SKIING,"CROSS-COUNTRY",7.2
2026  DATA  CANOEING," ",4.6
2027  DATA  MOUNTAIN CLIMBING," ",6.6
2028  DATA  GOLF, POWERCART, 2.3
2029  DATA  GOLF, PULL-CART, 2.7
2030  DATA  GOLF, CARRY CLUBS, 3.6
2031  DATA  HORSEBACK RDG, TROT, 3.1
2032  DATA  HORSEBACK RDG, POSTING, 3.6
2033  DATA  HORSEBACK RDG, GALLOP, 6.3
2050  REM  COMPETITIVE SPORTS
2051  DATA  BOWLING, " ", 2.5
2052  DATA  BADMINTON, " ", 4.3
2053  DATA  TABLE TENNIS, " ", 2.7
2054  DATA  VOLLEYBALL, " ", 2.3
2055  DATA  TENNIS, DOUBLES, 3.6
2056  DATA  TENNIS, SINGLES, 4.5
2057  DATA  PADDLEBALL," ", 6.6
2058  DATA  BASKETBALL," ",6.6
2059  DATA  HANDBALL," ",6.3
2060  DATA  SQUASH," ", 6.8
2061  DATA  RACQUETBALL," ",6.3
```

Listing continued.

Listing continued.

```
2100  REM  CHORES
2101  DATA  HOUSEWORK, LIGHT, 2.1
2102  DATA  TYPING, MANUAL, 2.6
2103  DATA  MOWING, TRACTOR, 2.6
2104  DATA  MOWING, POWER, 2.8
2105  DATA  MOWING, PUSH, 4.3
2106  DATA  CLEANING, WINDOW, 4.3
2107  DATA  MOPPING, FLOOR, 4.3
2108  DATA  SCRUBBING, FLOOR, 5.0
2109  DATA  VACUUMING, " ", 4.3
2110  DATA  SAWING, HARDWOOD, 6.3
```

End of listing.

Figure 1. *Partial activities listing.*

```
CALORIE BURNER
TOTAL CALORIES BURNED IN 1 DAY: 3033
-------------------------------------
ACTIVITY.............CAL/MIN MIN   TTL
-------------------------------------

BADMINTON                4.3   0     0
-------------------------------------
BALLET EXERCISES         3.3   0     0
-------------------------------------
BASKETBALL               6.6   0     0
-------------------------------------
BOWLING                  2.5   0     0
-------------------------------------
CALISTHENICS (MANY)      3.3   45    267
-------------------------------------
CANOEING                 4.6   0     0
-------------------------------------
CLEANING WINDOW          4.3   0     0
-------------------------------------
CYCLING 6 MPH            3.1   0     0
-------------------------------------
CYCLING 8 MPH            4.2   25    188
-------------------------------------
CYCLING 10 MPH           5.4   0     0
-------------------------------------
CYCLING 11 MPH           5.8   0     0
-------------------------------------
CYCLING 12 MPH           6.3   0     0
-------------------------------------
CYCLING 13 MPH           6.9   0     0
-------------------------------------
DANCING FOXTROT          3.3   0     0
-------------------------------------
DANCING FOLK             4.5   0     0
-------------------------------------
GOLF POWERCART           2.3   0     0
-------------------------------------
GOLF PULL-CART           2.7   0     0
-------------------------------------
GOLF CARRY CLUBS         3.6   120   777
-------------------------------------
HANDBALL                 6.3   0     0
-------------------------------------
HORSEBACK RDG TROT       3.1   0     0
-------------------------------------
HORSEBACK RDG POSTIN     3.6   0     0
-------------------------------------
HORSEBACK RDG GALLOP     6.3   0     0
-------------------------------------
HOUSEWORK LIGHT          2.1   0     0
-------------------------------------
MOPPING FLOOR            4.3   0     0
```

Figure 2. *Daily-activity log.*

```
CALORIE BURNER
TOTAL CALORIES BURNED IN 1 DAY: 3033
-------------------------------------
ACTIVITY.............CAL/MIN MIN   TTL
-------------------------------------

CALISTHENICS (MANY)      3.3   45    267
-------------------------------------
CYCLING 8 MPH            4.2   25    188
-------------------------------------
GOLF CARRY CLUBS         3.6   120   777
-------------------------------------
```

Figure 3. *Calories-to-pounds conversion report, obtained from suboption C of Master Menu option 2.*

```
-------------------------------------
ACTIVITY.............CAL/MIN MIN   TTL
-------------------------------------

SWIMMING CRAWL           5.8   0     0
-------------------------------------
335 MINUTES OF THIS ACTIVITY ARE ABOUT
EQUAL TO 1 POUND.

YOU WILL HAVE TO DEVOTE 30 MINUTES
PER DAY FOR ABOUT 134 DAYS IN ORDER
TO LOSE 12 POUNDS.
-------------------------------------
```

ity, your BMR will be higher. I'm assuming one effect balances the other.

When you're finished with this suboption, the option 2 menu reappears. If you want a hardcopy of this single-activity entry, press P. When you're ready to return to the Master Menu, press Q.

Option 3 in the Master Menu simply alphabetizes the list of activities. You might want to select this option before printing a list with option 1.

If you change your mind about some of your time entries, you can go back to each activity you need to edit and enter a new time (or zero). You can also reset to zero all entries you've made and return to your BMR by selecting option 4 from the Master Menu.

Option 5 ends the program. If you select this option accidentally after making several entries, all is not lost. Type GOTO 60 and, with luck, all your entries will still be there.

ENTERING NEW ACTIVITIES

The **Program listing** contains 53 common activities. You can reduce or expand this list as you like. The only requirement is that you change the number in line 1998 so that it's always the correct value for the number of activities in your list.

If you want to add activities, you'll need a table that contains appropriate calories-per-minute data. For the program to work properly, the calories-per-minute figure you enter in the data line should be for a 100-pound person. This information should be listed in whatever source you use. If the calories-per-minute data are given for a heavier person, subtract 0.01 times the number of pounds over 100 from the calories-per-minute listed. For example, suppose you find that knitting burns 3.1 calories per minute for a 130-pound person and you want to enter that into the table. Subtract 0.01 times 30 (0.3) from 3.1, giving roughly 2.8 calories per minute for a 100-pound person. (This example should help illustrate how approximate these calculations really are.)

For each activity you add to the list, enter a new data line like those included with the **Program listing**. The first entry after the word *DATA* is the name of the activity the program uses when you sort the list alphabetically. The second entry, separated from the first by a comma, is a descriptor. If the descriptor contains special characters or begins with a number, you must enclose it within quotes. If you have no descriptor to add, it's best to enter a blank space enclosed within quotes to ensure that you won't get a type-mismatch or out-of-data error when you run the program.

Following the descriptor is another comma, then the calories-per-minute value for a 100-pound person. Be sure to save your program to disk after making these additions. If you don't, the next time you load or run the program you'll have only the old data with which to work.

Keep the activity name and descriptor short, or the descriptor will be cut off when the line is printed. Calorie Burner allows 21 characters for the name and descriptor.

THE PROGRAM

If you paid close attention to Calorie Counter in my February column, you've probably recognized many similarities between that program and Calorie Burner. Both programs are organized and designed the same way. I added a few new subroutines and changed most of the variable names. I renamed variables to make the programs compatible, should I decide later to combine them into a single program.

Lines 10–90 contain the main program. These lines initialize variables and arrays, read data from the data lines (lines 1998 and up), input per-

sonal data and calculate BMR, and call the Master Menu display subroutine from line 60. The display subroutine returns M, the menu selection. Line 70 uses M to call the appropriate processing subroutine. When that subroutine returns control to the main program, the program cycles back to line 60 again.

Line 10 reads the first data item from line 1998 into NA. (This number *must* correspond to the number of activities in your list.) Line 10 dimensions six arrays with NA. AC$, TP$, and CB are filled with the activities, type descriptors, and calories per minute from your data list. T and QB hold the cumulative amounts of minutes and calories burned for all activities you select while running the program. The sort routine uses JX, an index array.

The data list is read in the subroutine at lines 200–290. If you get an "OUT OF DATA IN 220" or a "TYPE MISMATCH ERROR IN 220" error when you run the program, the problem isn't in line 220, but somewhere in your data list—a difficult place to track down errors. Missing commas and quotation marks are particularly common sources of error.

The subroutine at line 1200 prompts for and receives the individual's sex, age, and weight. The subroutine at line 1400 then calculates a generic BMR for the individual, based on these data. The formula in the subroutine multiplies the weight by 11 (for females) or 12 (for males) and reduces this value by 2 percent for each decade that person is over age 20. The program displays this for your general information, then divides the BMR by 1440 minutes per day to give your BMR in calories per minute.

Now whenever you enter a time for a given activity, the program subtracts that amount of time from 1440, multiplies the result by your BMR per minute, then adds in the calories burned by the selected activity.

The menu routine in line 700 simply displays the list of choices, obtains your response as M$, verifies that the response is allowed, and returns M, the numeric value of M$, to the main program. Line 70 handles branching to different program functions with an ON M GOSUB statement.

In case you missed Calorie Counter, you should pay special attention to the display-formatter subroutine at line 500. This subroutine converts an entire line of output to a single string (PL$) so that you can display the result or print it with a single, simple print statement. This approach is about as close as you can come to the PRINT USING command available in other versions of BASIC.

You should also study the code for the sequential-search process, controlled from the subroutine at line 800. The subroutine beginning at line 1000 performs the actual string comparisons for the search process. It searches each activity in your list, character by character, to find any part of a word that matches the search string you specified. The MID$ function is the key to this process.

Finally, the program uses the index array, JX, to refer to the data arrays (AC$, TP$, and CB) and the accumulator arrays (T and QB). JX is set up

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initially to contain the numbers one through NA in sequence, so that the program accesses the activities in the order in which they appear in your data statements. After sorting, however, the values in the JX array contain the activity subscripts in the order in which they would appear if the activities were listed alphabetically.

Indexing array data requires a little extra overhead in the program, since all subscripts must contain index references instead of simple variables. The time you save during a sort makes the index approach worthwhile, though. For example, sorting five parallel arrays would require 15 assignment statements each time two items in the list needed to be exchanged. With an index, only the index references are swapped, requiring just three statements. Furthermore, exchanging elements that are simple integers is considerably more efficient than exchanging complete names and strings.

CONCLUSION

Although the results you obtain from Calorie Burner are approximate, I think you'll find the program helpful in any type of fitness program or weight-management regimen, especially if you use it in conjunction with Calorie Counter. If you want to lose weight, you clearly must consume fewer calories than you burn. If you're physically active and want to maintain your weight, then the number of calories you burn must match the number of calories your food provides. (Don't we all wish it were as simple as that!)

Please take the time to compare the two programs. You'll gain insight into how you can easily modify the basic structure of one program to handle a different problem. Too often we set about "reinventing the wheel" every time we start to write a new program. Learning to use what we've already created not only increases our efficiency and output, it also helps us avoid "programmer's burnout."■

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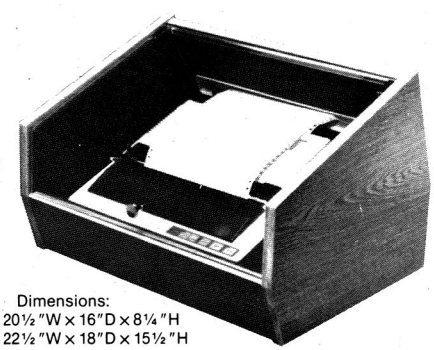

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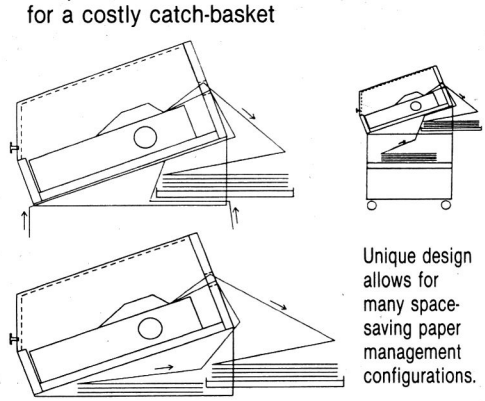

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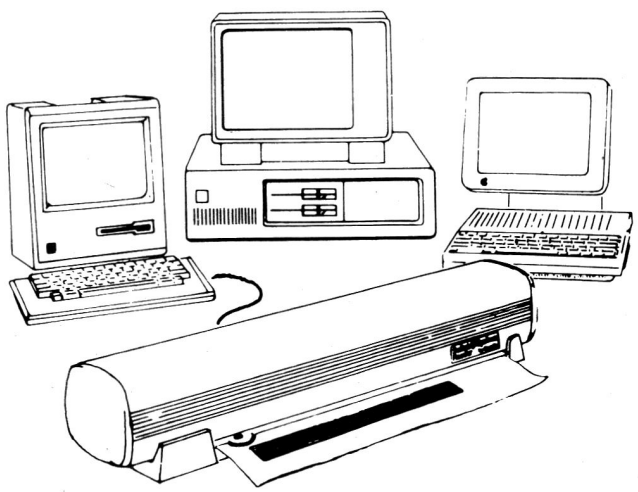

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GS File Prompts

Your GS' Standard-File dialog tools simplify filename selection.



by Tom Swan

How shall I prompt thee? Let me count the ways. On second thought, I won't even try—the number of ways Apple II programs prompt for filenames may be countless. Some programs force you to type names in full. Others display a directory; too many don't. The better ones let you use the arrow keys to select filenames from a list. Fortunately for Apple IIGS owners, the ROM toolbox does away with this confusion. Its two Standard File (SF) dialog tools offer consistent, easy-to-learn methods to open existing files or create new ones.

A dialog is a window (usually with a double-line border) through which you give commands, select program options, and read messages. Dialogs might ask you to click various buttons to select among a program's features. Others ask you to respond to questions. Some dialogs are one-way only, displaying error messages and other notes, for example. Two-way dialogs are more conversational, letting you "talk" to a program as well as receive messages. The SF dialogs—part of the File Manager toolset—are prime examples of the two-way variety. First, let's look at how they operate and then at how you can add them to your own programs.

USING STANDARD-FILE DIALOGS

If you're familiar with the Program Launcher, the program that lets you run other applications, you already know how to use the SF dialog SFGetFile, shown in **Figure 1**. Inside the dialog window, a prompt line such as "Open what file?" appears, followed by the disk's volume name plus the names of any open folders. Below this is the most important part: a window displaying the filenames from this disk or folder.

To select a file, click the mouse pointer on the filename, then click the Open button or press Return. To save time you can rapidly double-click the filename, which has the same effect. Click and drag the mouse pointer up or down to scroll more names into the window. You can also click the scroll-bar arrows, move the thumb (the unshaded block), or click in the shaded scroll-bar area to the left of the window. Notice that some files are bold, others dim. You can select only the bold ones.

On the right in the SFGetFile dialog are four buttons. Click Disk to switch to your second or third drive. Or remove a disk, insert another, and click Disk to view its directory. Remember to click the button after you change disks, not before. To change to a different folder on the same disk, select its name and click Open. Click Close to do the opposite, moving from one folder back to another, or click anywhere on the volume and folder name (above the file window). If you decide not to select a filename, click the fourth button, usually Quit or Cancel, to erase the dialog and return to the program. (In the Program Launcher only, the Quit button lets you change system disks or reboot.)

PROMPTING FOR NEW FILENAMES

When a program needs a new filename, it displays the SF dialog SFPutFile, shown in **Figure 2**. Similar to SFGetFile, this dialog adds a small text-entry window below the filename list. Type a name in this window and press Return or click Save. Use the mouse to position the flashing vertical-bar cursor, then click, drag, cut, and paste text as in other GS applications. Click Cancel if you change your mind about saving a file and want to return to the program. Click the New Folder button to create a folder in the current directory; be careful to always type the name of the folder before clicking the button. The other buttons—Close, Disk, and Open—operate as they do in SFGetFile.

While viewing SFPutFile, you might see two other smaller dialogs at the center of the screen. If you attempt to save a file that has the same name as another, the File Manager asks, "Replace existing file?" Click Yes to erase the original file and replace it with the information you're saving. Click No to return to the dialog window. If you type an illegal name (one that begins with a digit, for example) you'll see the message "This file's name is invalid." If this happens, click OK and type a different name.

SFPutFile and SFGetFile dialogs are intuitive and easy to learn. Best of all,

once you learn how to use them in one program, you'll know how to use them in others. Some GS application programs, such as Activision's Music Studio, employ nonstandard dialog windows that can detract from an otherwise excellent program. But in most GS software, the SF dialogs are like old friends. Even if you know what they're going to say, you're always glad to have them pop in for a visit.

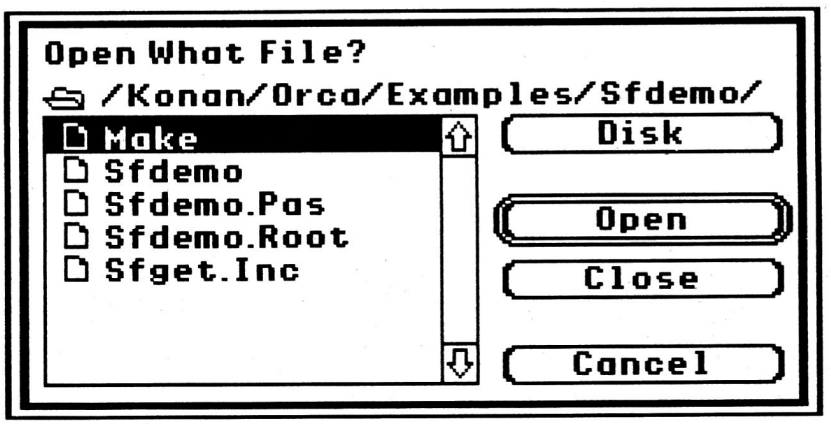
PROGRAMMING STANDARD-FILE DIALOGS

The most important rule to remember when programming SF dialogs is that they never read or write data to disk—that's the program's responsibility. The dialogs merely prompt for filenames and guard against accidentally erasing other files already there. Both tools require the ReplyRecord data structure in **Figure 3**. (Other languages, such as C and 65816 assembler, use similar constructions.)

The File Manager displays the dialog windows and fills in the six ReplyRecord fields, handling all mouse clicks and text-editing chores for you. After SFGetFile, if Boolean field good is TRUE, then the program should read the file of the name in fields fileName or fullPathName. After SFPutFile, the program should create a new file on disk.

After either dialog, the fileName field represents the file in the current prefix, number zero in ProDOS 16. The fullPathName adds volume and folder names. For example, if fileName is MYFILE.PAS, fullPathName could be /ORCA/TML/MYFILE.PAS. Field filler is unused. The fileType integer represents the ProDOS file-type value: Hexadecimal $1A signifies an AppleWorks word-processor document, 4 identifies a ProDOS text file, and so on. Field auxFileType catego-

Figure 1. SFGetFile dialog window.



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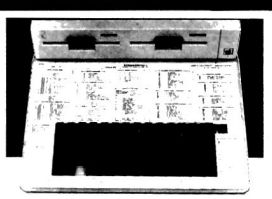

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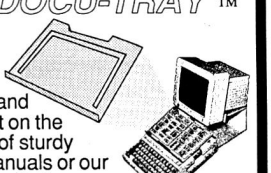

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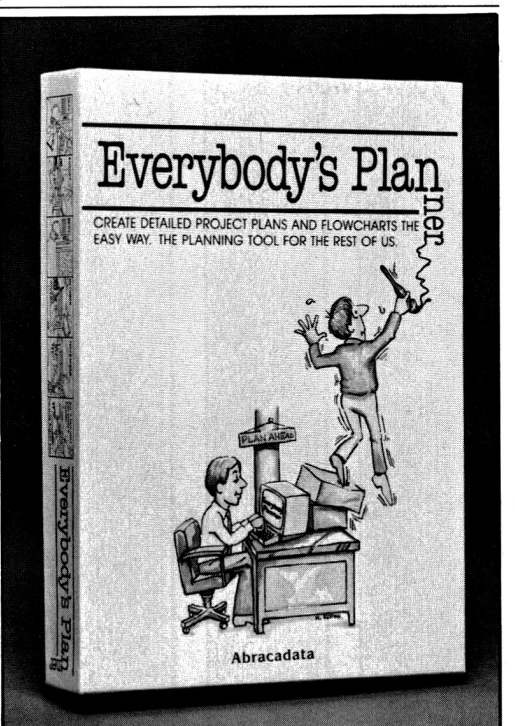

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rizes files further. ORCA/M uses it to distinguish source-text files (fileType $B0) as belonging to Pascal, assembler, C, or another language.

USING SFGETFILE AND SFPUTFILE

To prompt for a file to open, first create a variable of type Reply-Record. Let's call it *reply*. Then, execute SFGetFile this way:

```
SFGetFile( x, y, 'Open what file?', NIL,
NIL, reply );
```

Integers x and y locate the top-left coordinate of the dialog window, excluding the double-line border. Usually, you set y to 50. Set x to 150 in 640-by-200-pixel displays or to 28 in 320-by-200 mode. The string parameter is the prompt that appears above the filename list. I'll explain the two NILs in a moment. The last parameter is the reply record. After SFGetFile, if reply.good is TRUE, open the file. Otherwise, assume the operator clicked Cancel. Using SFPutFile to prompt for new names is nearly the same as this sample demonstrates:

```
SFPutFile( x, y, 'Save file as?', fName, 15,
reply );
```

Integers x and y again locate the top-left corner of the dialog window. The prompt string appears above the entry window where you type or edit filenames. Field fName is a 15-character string variable that can be empty (null) or a default filename. The 15 represents the maximum number of characters you can type. Use a smaller value (11, for example) if your program adds a suffix such as .TXT or .DAT to filenames. The final parameter is a reply record with the structure shown in **Figure 3**.

After you call SFPutFile this way, if reply good is TRUE, use the name in field fileName or fullPathName to create and save your file immediately. Don't worry about whether this action erases an existing file. The File Manager toolset warns you about this possibility automatically and requests permission to remove old files.

A STANDARD-FILE DEMONSTRATION

Type in the TML Pascal program in **Listing 1** and save it as SFDEMO .PAS. Use the following commands to compile and link the program under ORCA/M, then type SFDEMO to run it:

```
COMPILE SFDEMO.PAS
LINK SFDEMO KEEP = SFDEMO
```

The program in **Listing 1** has two pull-down menus in a 320-by-200-pixel display. Any desk accessories appear in the Apple menu to the extreme left. The program name SfDemo appears here, too, but does nothing. A second menu, File, contains three commands: *Open* displays the SFGetFile dialog; *Save* brings up SFPutFile; and *Quit* ends the program.

Feel free to experiment with these commands. The demonstration opens no files and writes nothing to disk. You can't harm files, even if you click Yes when a dialog requests permission to erase something.

When you open a file, its name later appears as the default when you choose the Save command. This is an important feature to understand. Look at this program's variable, fName, a 15-character string. Near the middle of **Listing 1**, procedures DoGetFile and DoPutFile execute the SF dialogs, setting fName to the result from the reply record if Boolean field good is TRUE. This way, the

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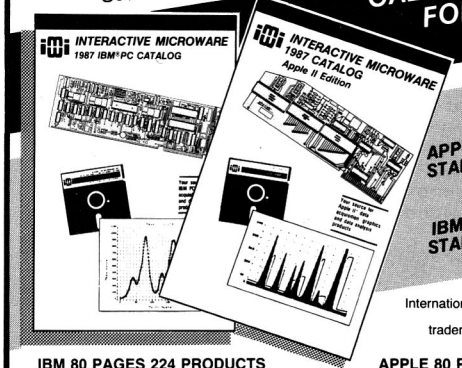

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program keeps track of a selected file while letting the File Manager do most of the work.

SELECTING FILES BY TYPE

In place of SFGetFile's two NIL parameters, you can store pointers to engage special options for restricting files to specific types. Replace the first NIL with the address of a filter procedure that decides whether to display filenames. It's too complicated to describe how to do that here, but, to summarize, you design a procedure the File Manager calls for each filename in the directory. This gives you complete control over which files appear in the window.

An easier way to display only specific files is to replace the second NIL with the address of a TypeListRec, as **Figure 4** defines. Set numEntries to the number of file types you assign to the remaining fields (up to eight). As an example, replace procedure DoGetFile in **Listing 1** with all of **Listing 2**. The new routine declares a typeList variable, sets numEntries to 2, and assigns two file types, limiting the dialog window to ProDOS TXT and ORCA/M SRC files. The at symbol (@) preceding typeList tells Pascal to pass the variable's address to SFGetFile. When you run the modified program, only files of those types now appear in the file-list window.■

Sneak Previews

The people at ByteWorks (4700 Irving Boulevard N.W., Suite 207, Albuquerque, NM 87114, 505-898-8183) are working on an ISO (International Standards Organization) Pascal compiler for their ORCA/M development system. When finished, the compiler will comply with the requirements of level 1, ISO 7185. Programs written according to this standard are likely to compile and run on other ISO Pascal systems with minimal changes. It's too early for me to give a release date or price—watch this space for more information.□ **—T.S.**

Tom Swan is the author of Pascal Programs for Data Base Management *and* Mastering Turbo Pascal, *published by Howard W. Sams. Write to Tom at P.O. Box 206, Lititz, PA 17543.*

Listing 1. Standard-File demonstration.

```
PROGRAM SFDemo;

{ Demonstrate Standard File Dialogs.
  Apple IIGS / TML Pascal / by Tom Swan }

USES QDIntf, GSIntf, MiscTools;

CONST
   ScreenMode = 0;          { Prepare for 320x200 display }
   MaxX       = 320;

VAR
  MyMemoryID : integer;          { This program's memory id }
  ToolsZeroPage : Handle;        { Toolkit zero page handle }
  userQuits : boolean;           { TRUE to quit program }
  appleMStr : str255;            { Holds Apple-menu definition }
  fileMStr : str255;             { Holds File-menu definition }
  fName : String[15];            { Name of "open" file }


PROCEDURE StartUpGSTools;

{ Initialize GS Toolset }

VAR   toolRec : ToolTable;       { For loading RAM tools }
      i       : INTEGER;         { FOR-loop index }

BEGIN
   TLStartUp;                     { init Tool Locator }
   MyMemoryID := MMStartUp;       { init Memory Manager }
   MTStartUp;                     { init Misc Tools }

   ToolsZeroPage := NewHandle(8 * 256, MyMemoryID,
      fixedBank+fixedblk+locked, ptr(0));

   QDStartUp(LoWord(ToolsZeroPage^), ScreenMode, 160, MyMemoryID);

EMStartUp(LoWord(ToolsZeroPage^) + $300,
   20, 0, MaxX, 0, 200, MyMemoryID);

MoveTo(40,40);          { Display message while loading RAM tools }
SetBackColor(0);
SetForeColor(15);
DrawString('Loading RAM based tools...');

toolRec.numTools := 10;     { Number of tools following }

FOR i := 1 TO toolRec.numTools DO With ToolRec.tools[i] DO
   CASE i OF
      1 : BEGIN tsNum :=  4; minVersion := 1 END;  { QuickDraw II }
      2 : BEGIN tsNum :=  5; minVersion := 1 END;  { Desk Mgr }
      3 : BEGIN tsNum :=  6; minVersion := 1 END;  { Event Mgr }
      4 : BEGIN tsNum := 14; minVersion := 0 END;  { Window Mgr }
      5 : BEGIN tsNum := 15; minVersion := 1 END;  { Menu Mgr }
      6 : BEGIN tsNum := 16; minVersion := 1 END;  { Control Mgr }
      7 : BEGIN tsNum := 21; minVersion := 0 END;  { Dialog Mgr }
      8 : BEGIN tsNum := 20; minVersion := 0 END;  { Line Edit }
      9 : BEGIN tsNum := 22; minVersion := 0 END;  { Scrap Mgr }
     10 : BEGIN tsNum := 23; minVersion := 0 END;  { Standard File}
   END; { case }
      LoadTools(ToolRec);    { Load tools into RAM }

      WindStartUp(MyMemoryID);
      Refresh(nil);
      CtlStartUp(MyMemoryID, LoWord(ToolsZeroPage^) + $400);
      MenuStartUp(MyMemoryID, LoWord(ToolsZeroPage^) + $500);
      ScrapStartUp;
      LEStartUp(LoWord(ToolsZeroPage^) + $600, MyMemoryID );
      DialogStartUp(MyMemoryID);
      SFStartUp(MyMemoryID, LoWord(ToolsZeroPage^) + $700);
      DeskStartUp
   END; { of StartUpGSTools }
```

Listing continued.

Listing continued.

```
PROCEDURE SetUpMenus;

{ Initialize pull-down menu bar }

VAR   Height : INTEGER;

BEGIN
   appleMStr := '>>@\N0X\0==SfDemo\N400\0==-\N401D\0.';
   fileMStr  := concat( '>>  File  \N1\0',
                        '==Open...\N401*Oo\0',
                        '==Save as...\N402*Ss\0',
                        '==Quit\N403*Qq\0.');
   SetMTitleStart(15);
   InsertMenu(NewMenu(@fileMStr[1]),0);
   InsertMenu(NewMenu(@appleMStr[1]),0);
   FixAppleMenu(0);
   Height := FixMenuBar;
   DrawMenuBar
END; { SetUpMenus }


PROCEDURE ShutDownGSTools;

{ Shut down tool sets before ending program }

BEGIN
   GrafOff;           DeskShutDown;     SFShutDown;
   DialogShutDown;    LEShutDown;       ScrapShutDown;
   MenuShutDown;      WindShutDown;     CtlShutDown;
   EMShutDown;        QDShutDown;       MTShutDown;
   MMShutDown(MyMemoryID);              TLShutDown;
END; { ShutDownGSTools}


PROCEDURE DoGetFile;

{ Prompt for file to open }

VAR   reply : ReplyRecord;

BEGIN
   SFGetFile( 28, 50, 'Open What File?', NIL, NIL, reply );
   IF reply.good THEN
      fName := reply.fileName
END; { DoGetFile }


PROCEDURE DoPutFile;

{ Prompt for name to save open file }

VAR   reply : ReplyRecord;

BEGIN
   SFPutFile( 28, 50, 'Save File As?', fName, 15, reply );
   IF reply.good THEN
      fName := reply.fileName
END; { doPutFile }


PROCEDURE ProcessMenu( codeWord : LONGINT );

{ Respond to a pull-down menu command }

BEGIN
   CASE LoWord( codeWord ) OF
      401 : DoGetFile;
      402 : DoPutFile;
      403 : userQuits := TRUE
   END; { case }
   HiliteMenu( false, HiWord( codeWord ) )
END; { ProcessMenu }


PROCEDURE MainEventLoop;

{ Intercept events (for example, mouse clicks) and respond }
```

Listing continued.

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Listing continued.

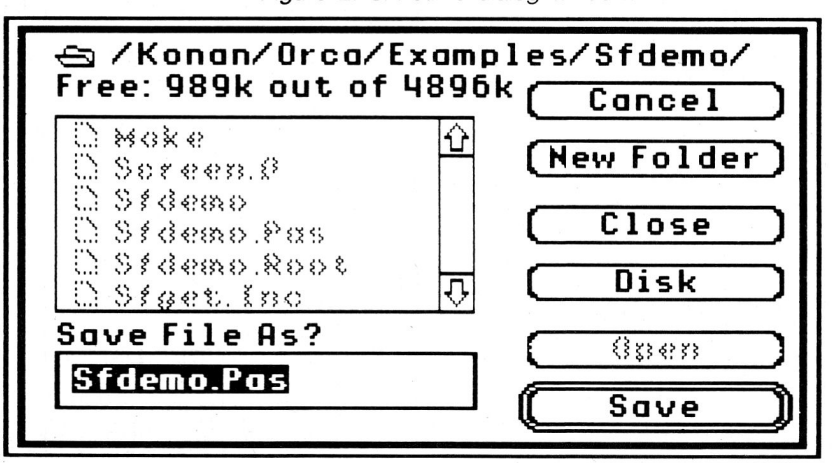
```
VAR   Event : EventRecord;
      code  : INTEGER;

BEGIN
   Event.TaskMask := $1FFF;       { Engage TaskMaster }
   userQuits := false;
   REPEAT
      code := TaskMaster(-1, Event);
      IF code = wInMenuBar
         THEN ProcessMenu( Event.TaskData )
   UNTIL userQuits
END; { MainEventLoop }


BEGIN
  fName := '';
  StartUpGSTools;
  SetUpMenus;
  ShowCursor;
  MainEventLoop;
  ShutDownGSTools;
END.
```

End of listing.

Figure 2. SFPutFile dialog window.



***Listing 2.** DoGetFile procedure displays only files of the specified type.*

```
PROCEDURE DoGetFile;

{ Prompt for text files only }

VAR

   typeList : TypeListRec;
   reply    : ReplyRecord;

BEGIN
   WITH typeList DO
   BEGIN
      numEntries := 2;     { Number of entries following }
      fileType1 := 4;      { Any ProDos TXT file }
      fileType2 := $B0     { Any ORCA/M SRC file }
   END;
   SFGetFile( 28, 50, 'Open what file?', NIL, @typeList, reply );
   IF reply.good THEN
      fName := reply.fileName
END; { DoGetFile }
```

Figure 3. SF dialog data structure.

```
ReplyRecord =
   RECORD
      good : BOOLEAN;
      filler : BOOLEAN;
      fileType : INTEGER;
      auxFileType : INTEGER;
      fileName : String[15];
      fullPathName : String[127]
   END;
```

Figure 4. Type-list record.

```
TypeListRec =
   PACKED RECORD
      numEntries : Byte;
      fileType1 : Byte;
      fileType2 : Byte;
      fileType3 : Byte;
      fileType4 : Byte;
      fileType5 : Byte;
      fileType6 : Byte;
      fileType7 : Byte;
      fileType8 : Byte;
   END;
```

Letters

Several readers have pointed out that the Applesoft BYE command does the same job as my program Relaunch (June 1987, p. 78). To return to the program launcher from BASIC, just type BYE. You don't need Relaunch. (Ah, well, I live and learn.)

Bill Basham of Diversi-Cache fame reminds us that typing Open apple-Control-Delete unlocks a sticky keyboard by flushing (erasing) all characters in the type-ahead buffer. In my June 1987 column (p. 80), I suggested using the control panel to turn off keyboard buffering. Bill's way is easier.□ **—T.S.**

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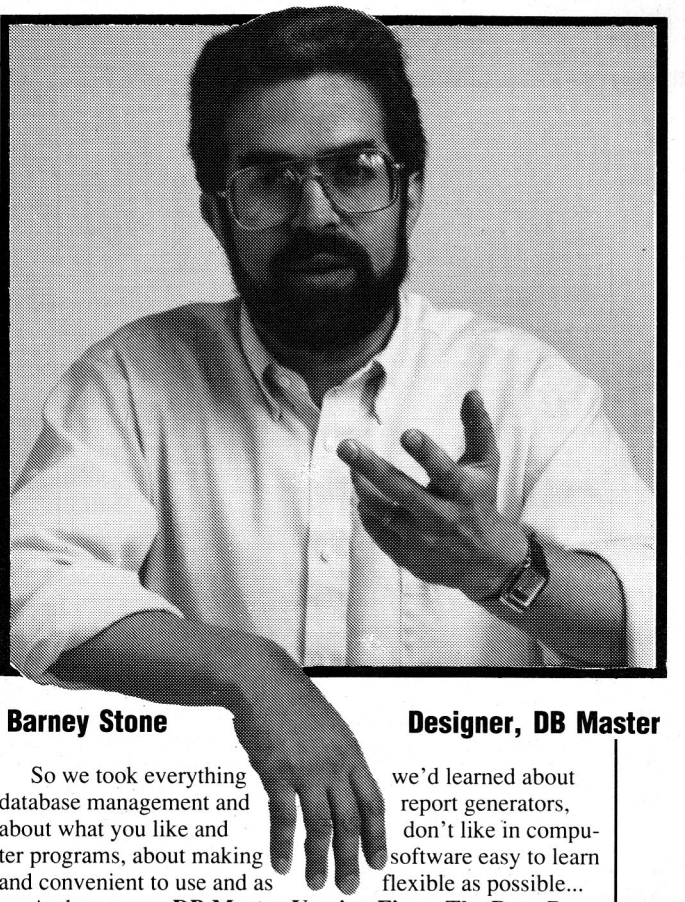

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- Yes/No—only accepts "Y" or "N"
- Date—11 formats available
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- Edit Date—last date when record edited
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F28 = F10*(F50>=F10)+F50*(F50<F10)
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by Cynthia E. Field

Children today need to master the same math facts we learned when we entered school. While basic operations (addition, subtraction, multiplication, and division) were the same then as they are now, we didn't have Stickybear, Roboman, or Number Munchers to help us learn simple computations.

Virtually all programs highlighted in this month's column offer an appealing interface with ample color graphics, animation, and sound. Nearly all provide automatic or selectable levels of difficulty, so that the problems become more challenging as your child becomes more adept.

TEN . . . NINE . . . EIGHT

Once a child can reel off the numbers one to ten (an assortment of programs to help youngsters learn to recognize numerals is described in "Early-Learning Software," p. 56 in this issue), he or she can begin counting objects, matching sets of objects with numerals, and performing simple arithmetic. At least five programs are devoted to helping children acquire these skills.

Counters, from Sunburst Communications, teaches counting, addition, and subtraction, using the numbers zero to nine. The program features large, colorful, familiar objects, such as trains and sailboats. The manual suggests parents provide supervision and assistance, but encourages you to "let children learn by themselves." A clean-cut, uncomplicated program, Counters is appropriate for children even as young as 4 years old.

In my last column ("Fundamental Writing Skills," July 1987, p. 81), I introduced you to Writer Rabbit from The Learning Company. Well, this bunny is a true Renaissance rabbit—he can teach arithmetic, too! As **Math Rabbit**, he takes children to the circus, where a series of four games helps them learn to count and perform simple arithmetic.

My favorite Math Rabbit activity is Clown's Counting Games. A vertical line is presented on the left side of the screen, along with the numbers zero to eight. This setup is unique in that each location on the number line corresponds to a note on the musical scale.

The Apple plays the corresponding tones as your child moves a clown's face to the desired position. These games make 1-2-3 as easy as do-re-mi. After your child correctly positions a series of clown faces, the computer plays the tune he or she unwittingly (or wittingly!) created.

Other Math Rabbit activities include the Tightrope and Mystery Matching Games, in which children learn to match objects with a target number. Circus Train Game teaches kids easy addition, subtraction, and sequencing.

MATH GAMES

If your child prefers an educational computing environment disguised as an arcade game, take a look at **Math Magic** (ages 4–9) and **Robomath** (ages 5–7) from MindPlay. Math Magic reminds me of Little Brick Out, a game that mesmerized me for hours on end when I purchased my first Apple six years ago.

The game plan in Math Magic is to hit balls with the on-screen paddle to knock down a wall of bricks. Behind the bricks lurk friendly monsters who propose addition and subtraction problems your child must solve before play resumes.

Robomath is like Math Magic—but for the environmentally astute. Instead of brick walls that hide monsters, factories in this computer town assemble Trashbots—nasty little polluters that leave garbage all over the screen.

The objective in Robomath is to use a paddle and balls to clean up the trash and eventually put the factories out of operation. Your child has to solve multiplication and division problems in the Quiz Boxes that appear among the litter.

Another arcade-style math game, **Number Munchers** from MECC (age 8 to adult), offers plenty of practice in recognizing multiples, factors, prime numbers, equalities, and inequalities.

In this game, which reminds me of Pac-Man, the heroes are members of the species *Munchicus digitus*. You move each Muncher around a matrix of arithmetic expressions that may match a target expression—or simply

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Notes*N*Files

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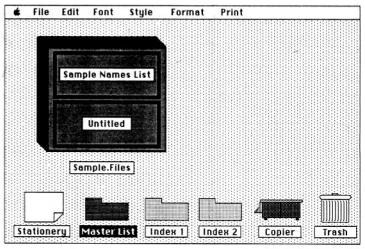
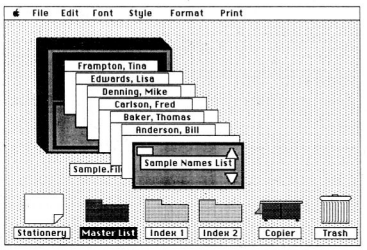
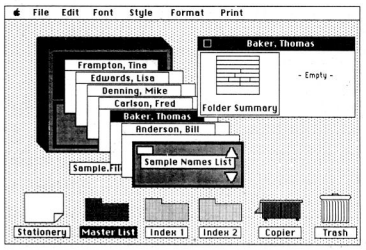


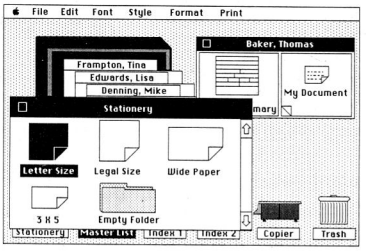
*1. In this picture of Notes*N*Files, the "file cabinet" is ready to be accessed.*



2. Using the Mouse, just pop open a drawer, and your "database" is revealed. (By the way, a drawer can hold over 3,000 folders with a single 3½" disk!)



3. Open up any number of folders with some quick mouse-clicks.



4. Then, as an option, you can write a letter, memo, etc., by merely grabbing a piece of stationery—and that letter or memo will be filed directly "inside" the folder of your choice.

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distract you. For example, if the target reads "Equals 4," you move your Muncher to any box containing an expression that returns the value 4 (4 x 1, 5 – 1, 9 – 5, and so on), skipping boxes that contain problems with the wrong solution (5 – 2 or 4 x 0, for instance).

To increase the tension, five species of Troggles follow in hot pursuit. Watch out for the Smarties—they munch on Munchers!

Number Munchers requires quick response—physically and mentally. This game isn't only motivating—it's downright captivating. Incidentally, another MECC program, Word Munchers, teaches phonics in much the same way.

DRILL AND PRACTICE

If you're looking for programs that teach arithmetic without the "game" scenario, consider **Stickybear Math** (addition and subtraction) and **Stickybear Math 2** (multiplication and division). These two products from Weekly Reader Software offer essential drill and practice in a colorful way, featuring Bedford Stickybear and his family.

In Stickybear Math, for instance, your child can help the Stickybears get out of various trouble spots. In one scenario, your child answers row or column math problems correctly to win blocks with which to build a platform to support Bedford, who dangles precariously from a window ledge.

A third program from Weekly Reader Software, **Math Word Problems**, isn't part of the Stickybear series, but could use some help from the Stickybears to liven things up.

Math Word Problems is simply a computerized database of about 150 problems whose internal numbers change to generate nearly limitless variations. Few educators would doubt that many students need help with word problems, and those presented in this program are reasonably interesting.

My disappointment lies in the program's lack of graphics. It does have an attractive pop-up calculator, but I suspect most parents and teachers prefer that kids at this level use paper and pencil to work out solutions to math problems.

Another program that would benefit from the Apple's graphics capabilities is **Numbers of Fortune**, a take-off on the popular TV game show *Wheel of Fortune*. In Numbers of Fortune, there are no "wheels"—instead, two vertical lines appear, along which potential points and phrases are listed, such as "Lose Turn" and "Bankrupt." At each "spin," a pointer runs up and down the line, finally stopping at a point value or phrase. The program presents a math problem your child must solve within the given time period. The idea is to accumulate 10,000 points.

This game has a lot of potential, but isn't quite ready for prime time. And at $49–$79, depending on the version, it seems a bit pricey.

Atypical



Open-Apple is Tom Weishaar's monthly newsletter for knowledgeable Apple II users. It's thin but packed tight with Apple II lore, humor, letters, tips, advice, and solutions to *your* problems. Compared to other Apple II publications, ***Open-Apple*** has the highest new-idea-per-issue ratio, the clearest writing, the funniest cartoons, the longest index, the *only* warranty (all your money back if you're not satisfied), and it takes up the least shelf space. The only thing it doesn't have is the most subscribers. Yet.

II cue #12

Hackers, by Steven Levy; *Fire in the Valley*, by Paul Freiberger and Michael Swain; and *The Little Kingdom*, by Michael Moritz, are three historical looks at personal computing with emphasis on the Apple II. *Hackers* has the broadest scope. It extends from MIT in the 1950s to Sierra On-Line in the 80s. *Fire in the Valley* concentrates on the convergence of forces that created the personal computer. *The Little Kingdom* is an historical look at Apple itself. For more information on these books, see our August 1985 issue, page 161.

From our fan mail:

After receiving my first issue, I immediately ordered and received Volume 1 and all back issues. I am up to my eyebrows in back issues, and my lovely wife is muttering something about wanting a separation agreement until I return to the land of the living. The sudden influx of meaningful, well presented information about the Apple is like having a fresh fruit feast.

Andy O. Breece
Virginia Beach, Va.

Open-Apple
P.O. Box 6331, Syracuse, N.Y. 13217

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BEYOND THE BASICS

Although their delivery systems differ, each of the nine programs mentioned so far focuses on basic arithmetic skills. But what about computational skills that go beyond the basics? Are there programs that teach practical math?

One product that stands apart from the crowd is **Fish Scales** from DLM. The program consists of six games, all worked into a recreational-fishing scenario. In Today's Catch, for instance, your child measures the length of a fish a fisherman holds next to a measuring stick.

Fish Scales teaches linear dimension without getting bogged down with specific English or metric units. In one activity, the program displays three fish and asks, "Which fish is 3 long?" In another game, your child determines which of two fish is closer to the dock.

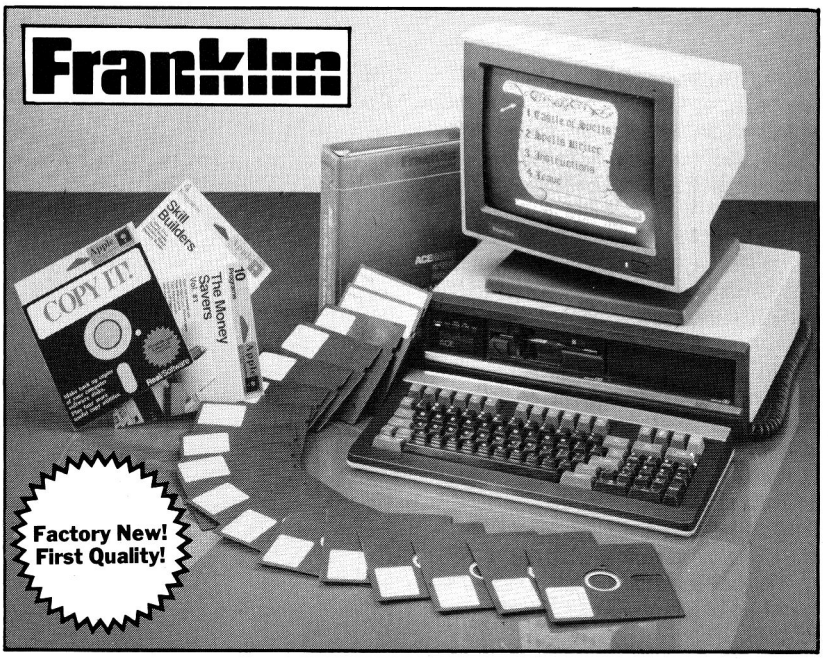
The program makes excellent use of color graphics—even the fish look real. The music is charming and appropriate. Among the tunes are *Sailor's Hornpipe* and *Row, Row, Row Your Boat.* At $29.95, Fish Scales is an excellent, inexpensive way to introduce your child to concepts of measurement and distance.

Older children (ages 6–15) move indoors from the fishing pier to the kitchen, where MindPlay's **Bake & Taste** helps them learn precise measurement. In this program, the child selects a dessert to create *à la* computer. The program then helps him or her learn where to gather ingredients (which ones are refrigerated? which ones are in the cupboard?) and how to measure and mix them according to the recipe.

As a follow-up activity, you can print the selected recipe and try it in a real kitchen with real measuring spoons and cups—followed by a real family taste test.

While Fish Scales and Bake & Taste teach measurement of tangible objects such as mackerel and milk, two programs for children aged 8 and up teach measurement of intangibles, such as people's opinions. In **Campaign Math** from MindPlay, your child plays the role of a politician. He or she must build a platform by polling imaginary people and determining the popularity of certain issues. Fund raisers are held and campaign contributions spent on advertising.

INCREDIBLE COMPUTER CLOSEOUT!



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Surveys Unlimited, from Learning Well/Mindscape, lets the political hopeful or social scientist in your family design and implement his or her own real-life statistical studies or opinion polls.

The program guides your child in setting up survey questions, which he or she can print and distribute to family members, fellow classmates, or neighborhood friends. The survey taker then enters the data and queries the program to display selected results in colorful graphics form.

The beauty of a program like Surveys Unlimited is its broad-spectrum application. Is it math? Social science? Communications? Computer literacy? This program is multidimensional and can act as a neat tool for any number of personal and school projects.

Besides statistics, another mathematical feature of everyday life is money. Two programs teach the value of work and its rewards.

Smaller children will enjoy **Donald Duck's Playground**, one of a series of Walt Disney Personal Computer Software programs from Sierra. In Donald Duck's Playground, your child helps Donald earn money to build a playground for nephews Huey, Dewey, and Louie. Donald takes jobs at places like McDuck Airlines, where your child helps him sort cargo to be shipped to various destinations. When Donald earns enough money, he can buy playground materials at Goofy's Junk Shop, Mickey's Hardware Store, or Minnie's 5 & 10.

In **Math Shop** from Scholastic, older children work in stores at the local shopping mall. Each store has its share of practical math problems you must solve to keep the customers happy. At Alice's Palace of Donuts, for example, your child has to recognize the correct proportion of various kinds of donuts ordered. All ten stores require quick and precise—not to mention practical—math skills.

DIFFERENT LEARNING STYLES

One child may take to numbers like the proverbial duck to water, while another may need extra support and encouragement to warm up to math. No matter what your child's previous experience is, take the time to introduce him or her to one or more of the programs described here. Who knows? Math anxiety may be eradicated in our lifetime—with a little help from Donald Duck, Roboman, and the Number Munchers.■

Write to Cynthia Field at 10 Border Avenue, Wakefield, RI 02879. Enclose a self-addressed, stamped envelope if you'd like a personal reply.

Product Information

Bake & Taste (ages 6–15)
Campaign Math (age 8 and up)
Math Magic (ages 4–9)
Robomath (age 7 and up)
MindPlay
82 Montvale Avenue
Stoneham, MA 02180
(800) 221-7911
(617) 438-5454
$39.99 each
$49.99 each (teacher's edition)

Reader Service Number 300

Counters
Sunburst Communications
39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
(800) 221-5912 (NY)
(914) 769-5030
(collect from Alaska and Canada only)
Ages 4–6
$59

Reader Service Number 301

Donald Duck's Playground
Sierra On-Line
P.O. Box 485
Coarsegold, CA 93614
(209) 683-6858
Ages 7–11
$29.95

Reader Service Number 302

Fish Scales
DLM Inc.
One DLM Park
P.O. Box 4000
Allen, TX 75002
(800) 527-4747
(800) 442-4711 (TX)
(214) 248-6300
Ages 4–8
$32.95

Reader Service Number 303

Math Rabbit
The Learning Company
545 Middlefield Road
Suite 170
Menlo Park, CA 94025
(800) 852-2255
(800) 852-2256 (CA)
(415) 328-5410
Ages 5–7
$39.95
$54.95 (school edition)

Reader Service Number 304

Math Shop
Scholastic Software
730 Broadway
New York, NY 10003
(212) 505-3000
Age 12 and up
$49.95
$69.95 school version (with teacher discount)

Reader Service Number 305

Number Munchers 1.1
MECC
3490 Lexington Avenue North
St. Paul, MN 55126
(800) 228-3504
(612) 481-3500
Age 8 to adult
$49 (5¼-inch disk)
$59 (3½-inch disk)

Reader Service Number 306

Numbers of Fortune
Addition and Subtraction, $49
Multiplication and Division, $49
Combined Operations, $79
three-disk package, $149
Fortune Software
70 Sierra Road
Boston, MA 02136
(617) 361-0900
Age 8 and up

Reader Service Number 307

Stickybear Math (ages 6–9)
Stickybear Math 2 (age 7 and up)
Math Word Problems (age 8 and up)
Weekly Reader Software
245 Long Hill Road
Middletown, CT 06457
(203) 638-2400
$39.95 each

Reader Service Number 308

Surveys Unlimited
Learning Well/Mindscape
3444 Dundee Road
Northbrook, IL 60062
(800) 443-7982
(800) 654-3767 (IL)
(312) 480-7667
Age 8 and up
$49.95

Reader Service Number 309

continued from p. 40

this way is far easier than using AppleWorks' "Other Activities," "select standard location of data disk," and "ProDOS directory" functions and typing slashes and pathnames.

PathFinder's "rename files" option is equally fast and convenient. Unlike AppleWorks' Open apple-N command, it changes the name of a file on disk instead of on the desktop. That's helpful if, for example, you want to keep an old version of a document and rename the disk file "old version" before you save the edited file.

I discovered one quirk—PathFinder renames files with upper- and lowercase letters in the same positions as in the original name. For example, if I changed a file called "AugExpenses" to "Expense Report," it would appear on disk as "ExpEnse report."

If you don't want to edit or delete a file, PathFinder's access to ProDOS' Lock and Unlock functions is helpful. If you try to save over a locked file, you won't be able to, but PathFinder will store the edited version you tried to save as an "AppleWorks.Temp" file on disk (until you unlock and resave the edited file). This is a nice touch if you decide to edit a locked file or forget you locked it.

The last menu option, "PathFinder Info," is, as author Randy Brandt notes in the on-disk documentation, "just that." Besides a plug for his Super MacroWorks (Beagle Bros) and a friendly recommendation of ExtraWorks, Brandt has a little fun with the legalistic prose of warranty disclaimers. After repeating Apple's licensing agreement for ProDOS ("Apple makes no warranties, either express or implied, regarding the enclosed software package" and so on), he paraphrases it: "About PathFinder: Like ProDOS, this product is basically useless and you're left holding the bag if anything goes wrong." Fortunately, PathFinder is definitely not useless.

WELL WORTH IT

In fact, at $20 a pop, both of these add-ons are well worth their cost. Whether you want custom-printing commands or want to make working with subdirectories smoother and faster, ExtraWorks and PathFinder are welcome additions to today's fleet of AppleWorks enhancements. ■

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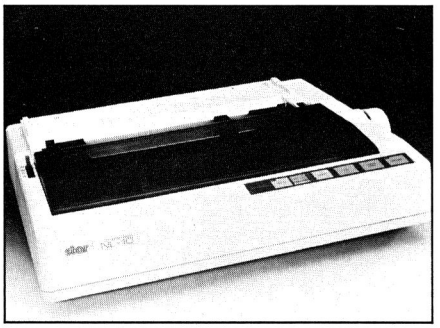

Looks Good on Paper

STAR NL-10

Star Micronics America Inc., 200 Park Avenue, New York, NY 10166, (212) 986-6770

Dot-matrix printer; parallel, RS-232C serial, or Apple IIc interface
$379 ($319 plus $60 interface cartridge)
Rating: ■■■

What category of computer products is breeding faster than IBM clones? Dot-matrix printers. Not only are there numerous printer companies, but each offers a fleet of models, with little apparent difference beyond speed increments of ten characters per second (cps). What's more, their printed output, whether draft or near-letter-quality (NLQ), is invariably described as "superior."

Star Micronics' latest entry into this crowded field, the NL-10, resembles any number of comparable printers currently available, but it can also claim several features that make it worth a closer look. Those features, however, may not be the ones most people consider first in the numbers game of "How much does it cost?" and "How fast does it print?"

PRICE AND PRINT

Price is obviously a legitimate concern, and the Star NL-10 is in the ballpark with competitive units in the low-to-medium price class. Its retail

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cost is $319—a slightly misleading number, since you'll also need a $60 plug-in serial or parallel interface as well as the proper cable. A ready-to-print Star setup, then, will cost around $400 before the discounters get hold of it.

As for performance, the NL-10 boasts bidirectional printing speeds of 120 cps in "superb" draft quality and 30 cps in "superior" NLQ mode. To put those numbers into context, the NL-10 printed a single-spaced draft page of 603 words in 53 seconds, or a little better than 600 words per minute. In NLQ mode, the same page took three minutes and 43 seconds.

Now, before you dismiss the NLQ mode as hopelessly slow, think twice—160 words per minute is faster than most of us can type without mistakes on the quickest electric typewriter, not to mention faster than other affordable NLQ printers.

If speed is relative, print quality is subjective. Compare samples from ten printers with similar features (true lowercase descenders and so on) and it becomes a case of beauty in the eye of the beholder. The Star NL-10 produces clean, readable type in draft mode (using a 9-by-11-dot matrix). The descenders are a full three dots below the line, for example, and openings in letters such as *e* and *a* don't have the squashed appearance produced by printers of lesser quality.

In NLQ mode, the NL-10 prints an italicized bold type (18-by-23 matrix) that results in an impressive-looking page. The slight slant of the italic font produces a unique, interesting appearance. It takes close scrutiny to confirm that it's indeed dot-matrix print.

EXTRA EASY

At this point, you might be wondering what sets the Star apart from its rivals. First of all, the NL-10 is one of the easiest of today's printers to operate. A handy front control panel gives excellent versatility at the touch of a button (or two, since most of the options require a combination of selections).

From the control panel, you can select the typeface, control the pitch (10, 12, or 16 characters per inch), and perform several other functions that, on other machines, require you to flip hardware DIP switches. To my knowledge, the Star is the only printer that lets you actually set left and right margins with the control panel, independent of any software you're using. Also, you can adjust the print-start position in increments of 1/72 inch. There are long and short self-tests and a hex-dump mode to help debug programs.

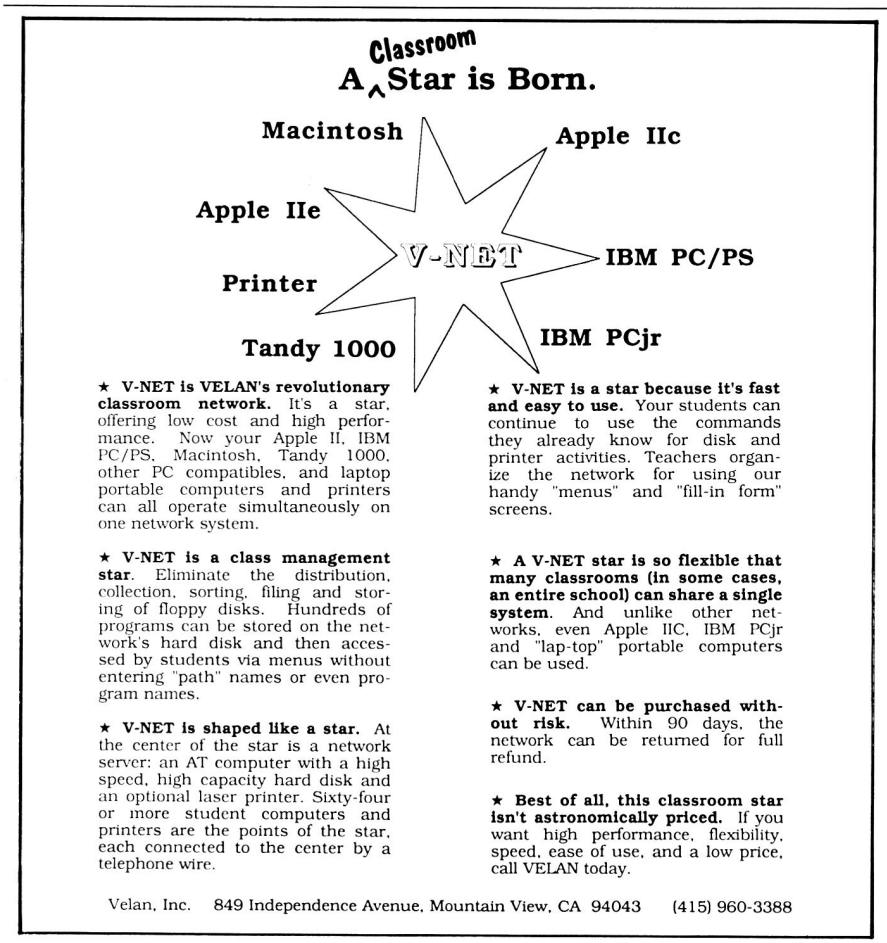
If you do need to access the NL-10's DIP switches, they're located on the back of the machine and are easy to reach once you turn the printer around and fight your way past cords and cables. Seriously, while I prefer DIP switches on the front or top of the printer to avoid moving the unit, the NL-10's are more conveniently located than those of many other printers. Besides, the Star is light and compact enough (13 pounds, 16 by 13 by 4 inches) to move without straining yourself.

Another important area in which the NL-10 shines is its compatibility with popular word-processing and graphics software. While the Star isn't ImageWriter-compatible, I had no text or graphics problems whatever with any program offering either a Star or Epson printer driver. The Print Shop, Certificate Maker, Dazzle Draw, and The Newsroom all worked without a hitch. AppleWorks underlined and boldfaced perfectly. Even Sideways operated successfully on the NL-10.

MORE FEATURES

The NL-10 uses either sprocket-feed paper (original plus two copies), handled by an adjustable tractor feed, or single sheets. You can select type of paper easily via a release lever conveniently located on the top left side of the printer, so there's no need to dig around inside the unit for strategically hidden switches. A short tear-off bar saves paper when removing printouts.

For single-sheet users, the Star comes equipped with an auto paper feed—not to be confused with the optional cut-sheet feeder—that engages the platen and rolls a sheet into position. Although the feeder works as advertised, it doesn't work as well as it sounds. I found the device saved no time compared to manually turning



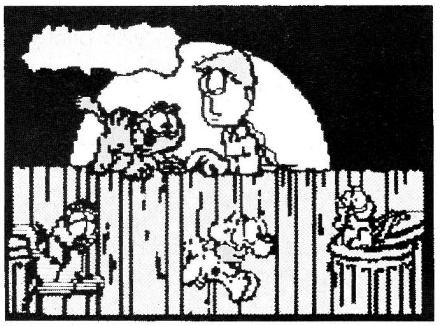
Circle 265 on Reader Service Card.

the platen knob, and if you fail to position the sheet correctly before employing the auto feed, the paper enters crookedly, requiring you to press the release lever again and realign. More valuable was the variable adjuster on the paper guide, which helps align paper in the first place.

Star's replaceable nine-pin printhead has an estimated life of 100 million characters. The NL-10 uses an easily installed ribbon cartridge that lets you replace either the entire cartridge or just the ribbon inside.

All in all, the NL-10 is worth a try if you're shopping for a full-featured yet relatively inexpensive printer. The unit is easy to use and produces attractive type, while giving you several extras that make it stand out among comparable printers.■

James V. Trunzo
Leechburg, PA



Comic-Strip Creativity

CREATE WITH GARFIELD

DLM Educational Software, One DLM Park, Allen, TX 75002, (800) 527-4747 or (214) 248-6300

Comic-strip designer; 64K Apple II Plus or later
$39.95
Rating: ■■■

WALT DISNEY COMIC STRIP MAKER

Bantam Software, 666 Fifth Avenue, New York, NY 10103, (212) 765-6500

Comic-strip designer; 64K Apple II Plus or later
$39.95
Rating: ■■■■

Most of us have chuckled over and clipped out a favorite newspaper comic strip to tape to our refrigerator or file cabinet. With DLM's Create with Garfield and Bantam Software's Walt Disney Comic Strip Maker, you no longer have to wait for a cartoonist: You can cast Garfield, Odie, Mickey, Donald, and other characters in adventures of your own.

THAT DARN CAT

Create with Garfield brought a great deal of enjoyment, along with one disappointment. To take the positives first, the user's guide is easy to read. After introducing you to Garfield and his friends (Odie, Jon, Arlene, Nermal, and Pooky), the booklet tells you how to boot and run the program in so simple a style that young children should be able to understand it with only slight coaching from an adult.

The program lets you choose from five backgrounds, then overlay various cutouts showing Garfield, his friends, and various props. Once you position characters and props, you're ready to add dialogue: Choose from a full set of preprinted word balloons or empty ones, into which you insert your own words. And, since no comic

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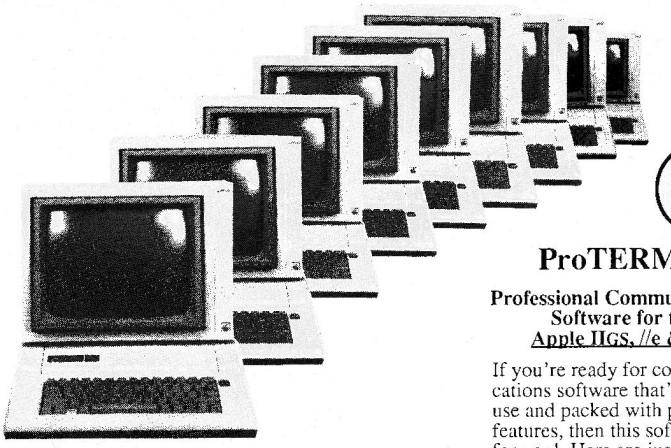

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Get all the advantages of expanded memory for your Apple //e at the lowest price anywhere! This card offers the ultimate in expandability:

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MultiRam™ Plus is //e memory that's ready for work when you are! The External Power Module (optional) keeps your programs and data alive, even after you call it a day. The next time you power up, your solid-state hard drive is ready for instant access!

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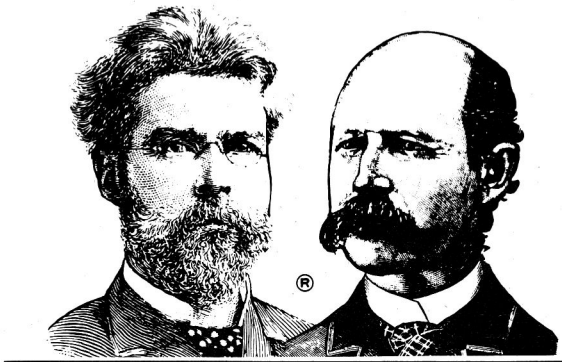

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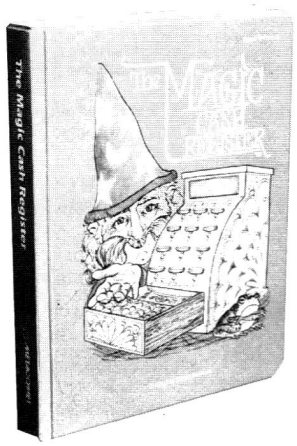
NEW PRODUCTS

edited by Ellen Otis

Software

KIDS CASH IN

Children in grades 3–6 can strengthen their **math skills** with The Magic Cash Register. Young entrepreneurs open their own store and buy products whose prices appear on the register; kids then add, subtract, and multiply to figure out the total cost and make change. The program analyzes any wrong answer: It first explains why you made an error, then introduces a "Wizard" character showing how to do the operation correctly. The game includes a coloring booklet and play money. It all adds up to $34.95 from Metacomet Software, P.O. Box 31337, Hartford, CT 06103, (203) 223-5911. Circle Reader Service number 353 for more information.



The Magic Cash Register helps develop children's math skills as they add, subtract, and multiply prices and make change.

MAKING HISTORY

History and political science come to life with Understanding the **United States Constitution**, a program designed to help students learn about and test their knowledge of our federal government and national political system. The package is also helpful for adults preparing to take the U.S. citizenship examination. Be ready for the Constitution's 200th birthday for $49.95 from Mindscape Inc., 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667. Circle Reader Service number 350 for more information.

LAND APPRECIATION

Learning the **real-estate** market is less overwhelming with Albert J. Lowry Real Estate Investment and Management. The program is designed to help you target the best real-estate buys and recognize those properties likely to increase in value. It shows you how to minimize your down payment and develop cost-effective management strategies. The documentation provides step-by-step instructions along with glossaries of real-estate terms, architectural styles, and structural types. The package lists for $99.95 from Simon & Schuster, One Gulf & Western Plaza, New York, NY 10023, (212) 373-8882. Circle Reader Service number 351 for more information.

HAND SIGNALS

Does your or a friend's handwriting reveal personality secrets? Given a signature or other script sample, Ciasa's **Handwriting Analyst** program leads you through a series of 63 multiple-choice questions about letter shapes and formations, then offers a quick or detailed personality profile. Trace your traits for $49.95 from Ciasa, 2017 Cedar Street, Berkeley, CA 94079, (415) 644-2771. Circle Reader Service number 354 for more information.

THE THIRD R

Math Tutor, a comprehensive series of four **arithmetic tutorials** for students in grades 1–6, teaches the basics of addition, subtraction, multiplication, and division.

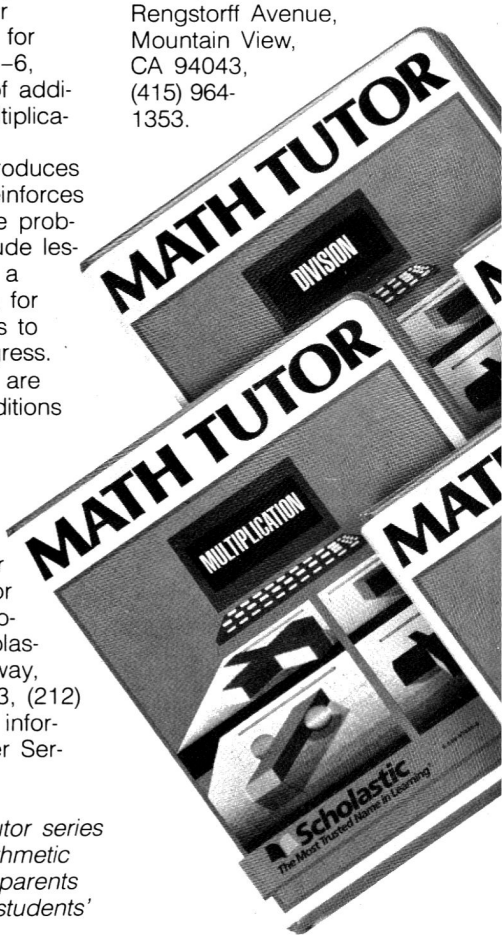
Each program introduces the operation and reinforces learning with practice problems. Packages include lesson worksheets and a management system for parents and teachers to track children's progress.

All four packages are available in home editions ($59.95 each) and school editions ($99.95 each), which include lab packs and are available at educator discounts. Math Tutor is produced by Scholastic Software, Scholastic, Inc., 730 Broadway, New York, NY 10003, (212) 505-3000. For more information, circle Reader Service number 355.

Scholastic's Math Tutor series teaches the four arithmetic operations and lets parents and teachers track students' progress.

BOMBS AWAY

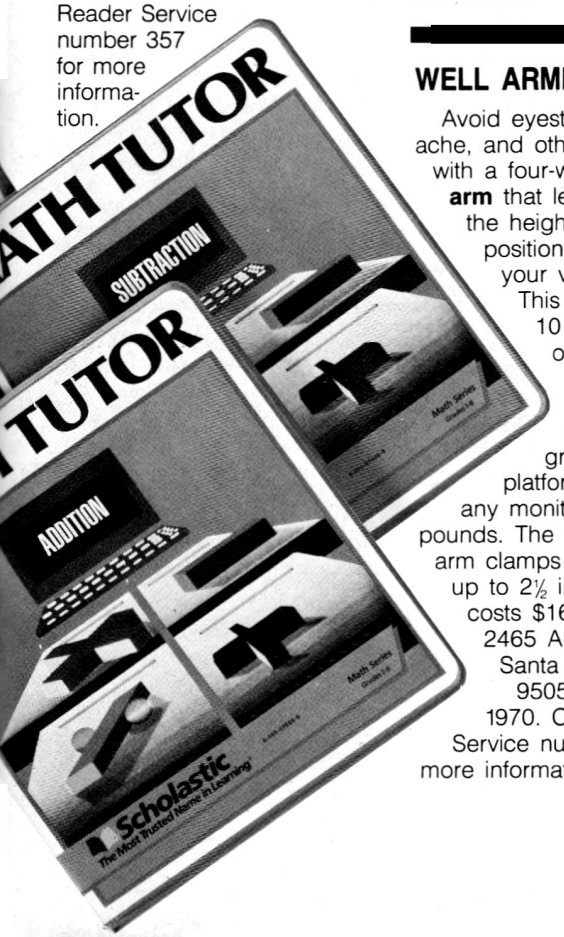
Be the pilot (and also the copilot, navigator, engineer, and bombardier) of a **B-24 Liberator** of the 406th Bombardment Group in World War II. B-24, a simulation of 19 combat missions, lets you determine the flight path, speed, altitude, and bomb-drop points for an entire bomber formation. Training missions sharpen your takeoff, landing, and bombing skills, while an on-screen instrument panel and variables such as engine-performance level and random weather conditions add to B-24's realism. The game costs $34.95 from Strategic Simulations, Inc., 1046 North Rengstorff Avenue, Mountain View, CA 94043, (415) 964-1353.



For more information, circle Reader Service number 352.

PRODOS FORTH

ProDOS programmers can now work with Go FORTH, an implementation of the 1979 language, which can be extended to the 1983 standard. This **FORTH compiler** comes with an assortment of extensions, including a built-in system editor and assembler for easier program development. The base-system software is $59.95 from Pair Software, 3201 Murchison Way, Carmichael, CA 95608, (916) 485-6525. Leo Brodie's tutorial manual, *Starting FORTH*, is available for an additional $19.95. Circle Reader Service number 357 for more information.



Hardware

FOR ALL TO SEE

Project computer images onto a screen or wall with the MagnaByte Imaging System. A transparent liquid-crystal display (LCD) "palette" that sits on top of a standard overhead projector displays 80-column text and graphics for classroom presentations. Distributed by MECC, this portable six-pound system sells for $1200 and carries a one-year warranty. Contact MECC, 3490 Lexington Avenue North, St. Paul, MN 55126-8097, (612) 481-3500. Circle Reader Service number 362 for more information.

WELL ARMED

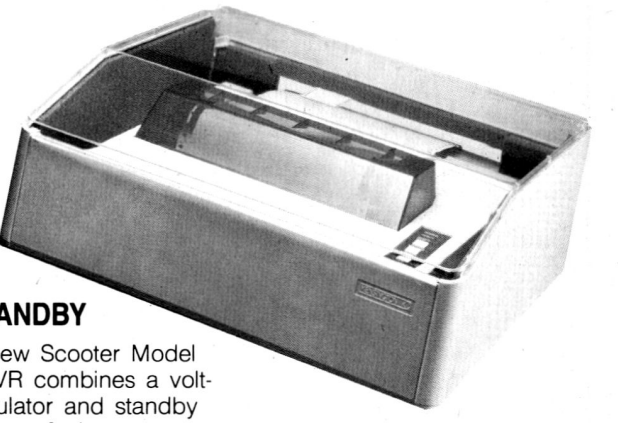
Avoid eyestrain, backache, and other problems with a four-way **monitor arm** that lets you control the height, distance, position, and angle of your video monitor. This device can tilt 10 degrees up or down, rise 11½ inches, and turn 360 degrees. A rubber platform mat grips any monitor up to 30 pounds. The steel monitor arm clamps onto desks up to 2½ inches thick. It costs $169 from Inmac, 2465 Augustine Drive, Santa Clara, CA 95054, (408) 727-1970. Circle Reader Service number 361 for more information.

ON STANDBY

The new Scooter Model SPS450VR combines a voltage regulator and standby **power supply** in a compact, 18-pound electronic unit. The system features an internal alarm for low battery or primary-power loss, regulated automatic recharging, automatic shutdown to protect the battery after discharge, and status-indicator lights. The Scooter SPS450VR sells for $895 from Ohm/Electronics, Inc., 746 Vermont Street, Palatine, IL 60067, (800) 323-2727. For more information, circle Reader Service number 360.

NO MORE FLOPPIES

Apple IIGS owners can access programs and files faster with MDIdeas' OctoRam ESP. The GS system and Control Panel software sees this add-on to the OctoRam memory card as a **bootable ROM disk**, though its static-RAM circuitry lets you write and retrieve files as you would with conventional RAM disks. A nickel-cadmium battery keeps data in RAM, ready for rebooting, even when your computer is turned off. The card costs $179.95 with 128K of memory, and is expandable to 512K using 64K upgrade packs ($35 each). Contact MDIdeas, Inc., 1163 Triton Drive, Foster City, CA 94404, (415) 573-0580, or circle Reader Service number 358 for more information.



Stifle your printer's noise and protect it from dust with Kensington's Printer Muffler.

PRINT IN THE BOX

Kensington's sturdy, foam-lined Printer Muffler enclosures keep printers safe from dust while cutting **printer noise** by 75 to 85 percent. The Printer Muffler 80 ($59.95) accommodates most 80-column printers, while the Printer Muffler 132 ($79.95) fits wide-carriage units. They're available from Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010, (212) 475-5200. Circle Reader Service number 359 for more information.

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

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- **How to print page numbers.**
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- **How to keep your tax records organized.**
- **Why you should leave your computer on.**

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ROMING AROUND

For answers to questions about **CD-ROM** applications, check out the second edition of the *Optical Publishing Directory.* This guide provides information on products from 48 publishers in seven separate categories—business, education and academia, government sources, science, library reference, library automation, and medicine. Cross-referenced data on publishers are also included. The directory costs $45 plus $2 shipping and handling from Learned Information, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8707, (609) 654-6266. The price includes two updates. Circle Reader Service number 364 for more information.

Product Updates

- Intuit has released a new ProDOS version of **Quicken**, featuring full subdirectory support, multiple-account data storage on larger-capacity disks, and built-in file-management tools. Current Quicken owners can upgrade to ProDOS for $20 and receive a conversion utility to translate their existing data files into ProDOS format. The upgrade is free if you bought Quicken after December 1, 1986. Contact Intuit at 540 University Avenue, Palo Alto, CA 94301, (415) 322-0573.
- Two popular games are now available in 16-bit, super-hi-res versions for the IIGS. **Hacker II: The Doomsday Papers** gives you sophisticated remote-control equipment, but few clues, to steal a plan for world domination from a Soviet laboratory vault. Start your mission with Activision, 2350 Bayshore Parkway, Mountain View, CA 94043, (415) 960-0410. If you'd rather save the town of Skara Brae from the evil wizard Mangar, **The Bard's Tale** has been retold in colorful GS detail. Assemble a band of warriors and raid Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171.
- The educational-software business is booming at **Mindscape Inc.**, which has bought most of the assets of the Holt, Rinehart & Winston software unit formerly known as CBS Interactive Learning. All operations will be moved to Mindscape's suburban Chicago offices.

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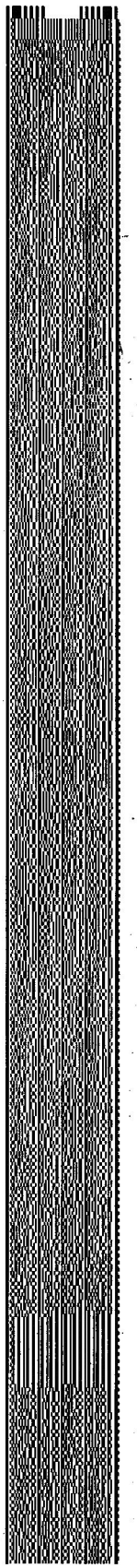

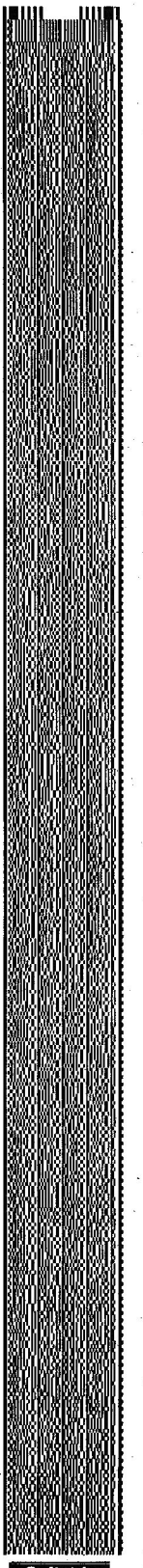

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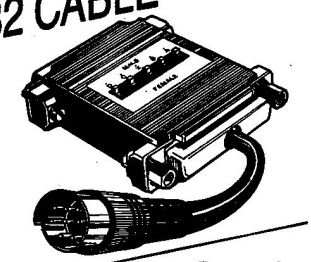

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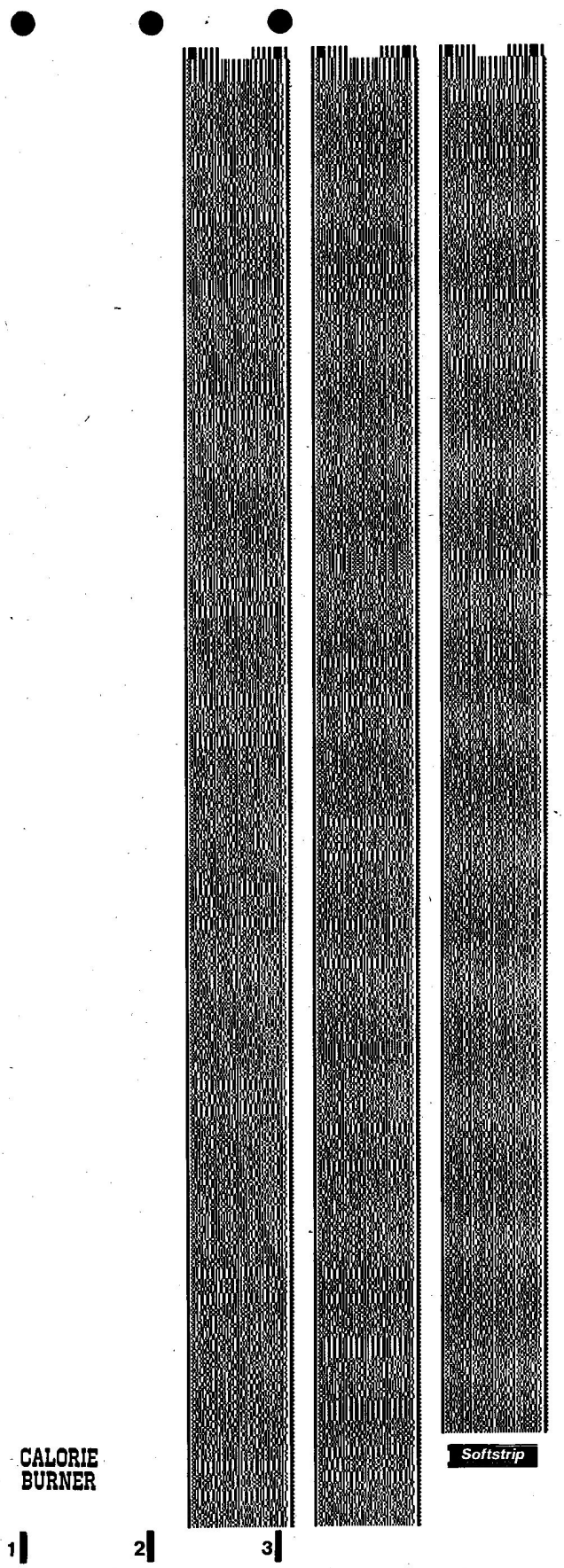

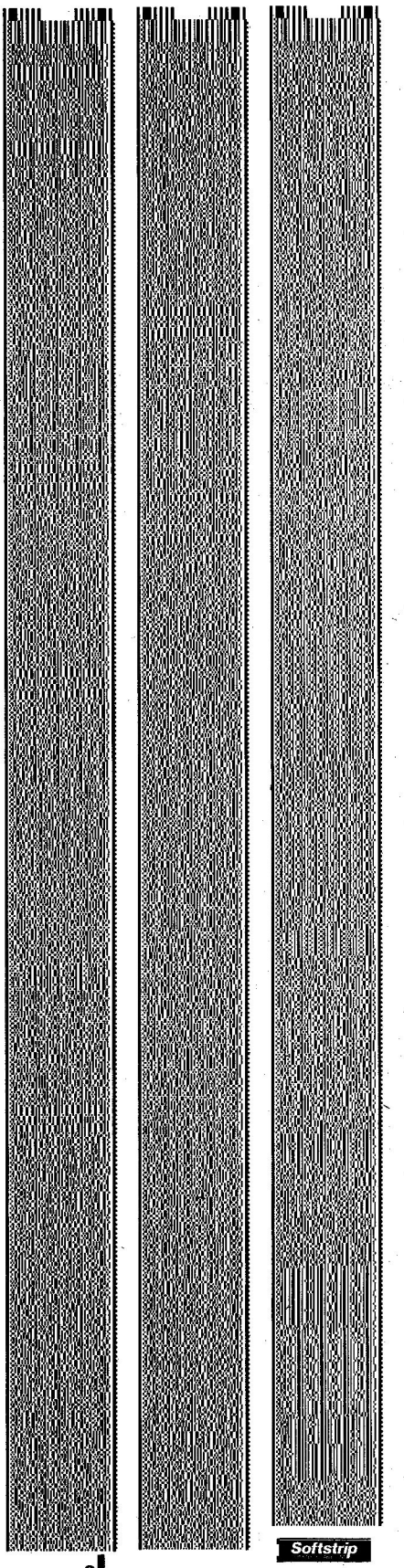

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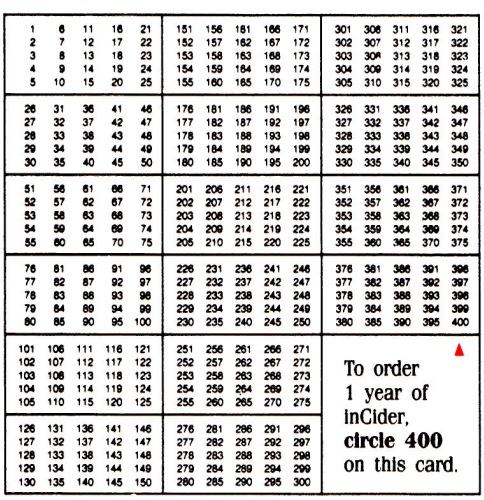

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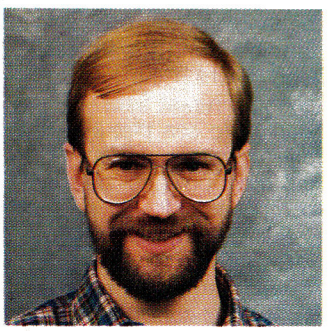
Sea Simulations: Halfway to Reality



"Good game play certainly helps sell software, but the true enthusiast craves realism, too."

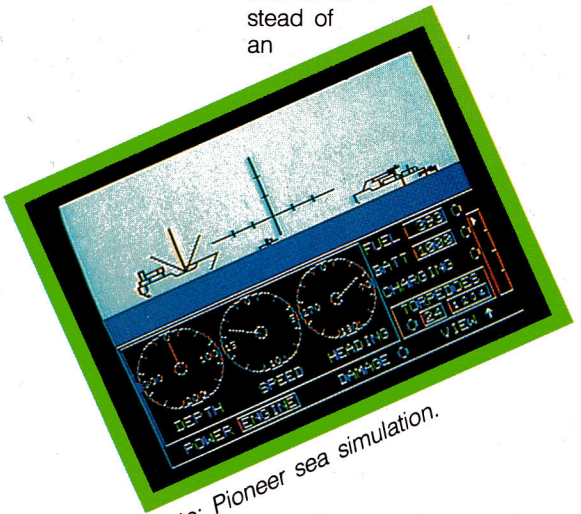
by Scott Mace

As computers grow more powerful, our view of the world through computer games becomes much more realistic. Early flight simulators represented the first wave of realism. Magically, coordinates on a grid became airport runways, roads, cities, and buildings. Gaming enthusiasts couldn't get enough of this "cockpit action."

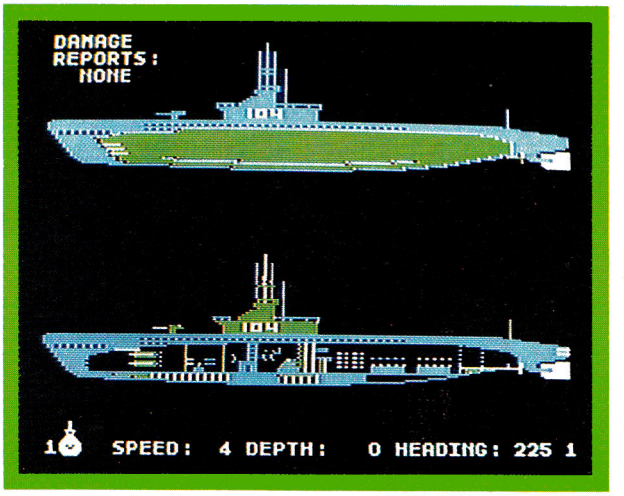
But the flaw in the original flight simulators was their lack of moving objects in the sky. Games that added mountains, valleys, or other aircraft often sacrificed realism for the sake of play action. Good game play certainly helps sell software, but the true enthusiast craves realism, too.

SUB TECHNOLOGY

That's why the appearance of Spectrum Holobyte's **Gato** (2061 Challenger Drive, Alameda, CA 94501, 415-522-3584, $39.95) in 1984 was a sensation. For the first time, a simulator let you pilot a submarine instead of an aircraft. In Gato you operate both sonar and radar; the sea is alive with targets, enemy craft, and islands. Underwater simulation proved very popular, and soon more sea simulations followed.



Gato: Pioneer sea simulation.



Silent Service: Fast combat, realistic detail, and attention to technology.

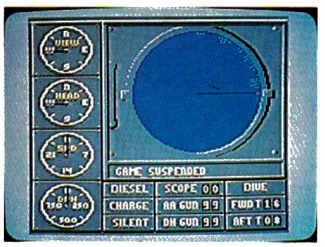
Silent Service from MicroProse (120 Lakefront Drive, Hunt Valley, MD 21030, 301-771-1151, $34.95) stresses confrontation and fast combat more than Gato. Damage and death come quickly and often. Even veteran sub captains say the experience is realistic—and it's a better game all around.

Silent Service ups the submarine ante by adding "reality levels," incorporating features such as limited visibility, whereby enemy ships appear only if they're within radar or sonar range; a "convoy zig-zag" setting that causes enemy ships to change course, making detection and tracking more difficult; dud torpedoes, a significant problem in 1942 and 1943; and tougher enemy destroyer escorts.

Silent Service also recognizes that even during a war, technology changes. For instance, hulls were built stronger after August 1943, letting you take your sub from the previous maximum depth of 300 feet to the new depth of 425 feet. The less-easily detected electric torpedo was added in late 1944.

For the full-time war-game buff, **Warship** from Strategic Simulations (1046 North Rengstorff Avenue, Mountain View, CA 94043, 415-964-1353, $59.95) is a must. In addition to the usual rigorous attention to detail typical of war games—including 24 types of guns with varying ranges and destructive power and four World War II Pacific Ocean scenarios—Warship is unique in letting you create your own missions.

By letting you draw your own custom maps, SSI has extended Warship's playability almost indefinitely. The game is mostly strategic, however, played from an overhead-map perspective, so it doesn't give you the thrill of looking at your newly created island through a periscope.



Sub Battle Simulator: 60 WWII missions.

Simulations continue to improve the seagoing experience incrementally. Epyx's **Destroyer** (600 Galveston Drive, Redwood City, CA 94063, 415-366-0606, $39.95) offers new enemy targets—low-flying aircraft. As a surface vessel, your craft is equipped with anti-aircraft guns.

Electronic Arts continues the surface-ship trend with **PHM Pegasus** (1820 Gateway Drive, San Mateo, CA 94404, 415-571-7171, $39.95; see Mace on Games, July 1987, p. 97), which brings even more realistic animation to your cockpit view of battle.

The added dimension of depth, though, ensures that sub games will provide better overall play than surface-ship simulations.

Epyx's **Sub Battle Simulator** ($39.95), for example, includes 60 missions, based on World War II scenarios. You play the role of commanding officer of one of six U.S. Navy subs or German Kriegsmarine U-boats.

Sub Battle Simulator's screen organization makes more sense than that of other games. It splits the screen into two windows. When you click the mouse on one of five choices, the right side gives you a view from the tower, through the periscope or binoculars, or via sonar or radar. Through the left window you'll see your maps—five displays, from seven to 2000 miles across.

If sub simulators have any fault, it's that real subs have whole walls of consoles. Most simulations require you to "hot key" back and forth among consoles. A single computer monitor can't do it all, but Epyx has put two main consoles on a single screen very nicely. Someday, perhaps, we'll see a generation of Apple IIs powerful enough to drive two or three displays.

The next step is to fill in the details of our undersea world. Designers will give us the canyons, crevasses, ice floes, and fjords where today's subs play a deadly game of hide-and-seek.

Even more impressive will be landing-party scenarios, the final trend toward realism, in which the terrain will change in real time. We're starting to see that in a few driving games written for the most powerful personal computers.

Full development will require far more processing power than the original flight simulators, but it will be the ultimate experience in reality on a computer. Today's sea games will have "paved" the way.■

Write to Scott Mace at 6510 Copper Ridge Drive #T-1, Baltimore, MD 21209.

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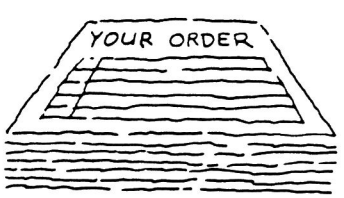

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Apple IIc /RAM Filer

by Merle C. Harton, Jr., Ph.D.

When you run a ProDOS program on the 128K Apple IIc, ProDOS gives you a usable pseudo disk drive, volume /RAM, under Applesoft. Your IIc has at least 119 blocks (61K) of available memory in RAM, after all ProDOS and BASIC.SYS startup demands are met, if you run programs that require no more than 61K of memory.

You can use this extra memory in two ways, as the following short utilities show. ProDOS lets you use a significant part of this extra memory to store programs while you use other applications. The IIc's memory capacity and the RAM disk's quick access time give you greater control over your programs.

CREATING A "DESKTOP"

Suppose you run in sequence a BASIC graphics game, a utilities program, and a calculator program. Each program is available in RAM, but only until you load a new application, leaving only one program in RAM at a time. You can keep these three programs on your "desktop" to use later, without having to load them again from floppies.

One way is to type SAVE/RAM */program name* to save each program to the RAM disk after loading it. As long as your Apple is still on, just type RUN/RAM/*program name* whenever you want to run a program again.

This procedure incurs two problems, however. First, the RAM-disk volume can store only 12 program files. ProDOS allocates only one volume block for the RAM disk instead of the usual four blocks for physical drives, which give you 51 standard entry possibilities. Second, the first files you save to the RAM disk are mapped to hi-res pages 1 ($2000–$3FFF) and 2 ($4000–$5FFF). If you intend to use hi-res graphics, you must protect the 34-page block (17K). Unfortunately, this also leaves a ten-file allocation in the remaining 44K area.

Listing 1. /RAM starter.

```
5  REM  /RAM STARTER
8  REM  Save as RAMSTARTER
10  HOME :D$ =  CHR$ (4)
20  PRINT D$;"BSAVE/RAM/0,A$2000,E$3FFF"
30  PRINT D$;"BSAVE/RAM/00,A$4000,E$5FFF"
40  PRINT D$;"CHAIN RAM1"
50  END
```

Listing 2. /RAM/PROGRAMS maker.

```
5  REM  /RAM Program Directory Maker
8  REM  Save as RAM1
10  PRINT D$;"CREATE/RAM/PROGRAMS"
20  PRINT D$;"RUN RAMFILER"
30  END
```

Listing 3. RAM-disk filer.

```
5  REM  /RAM Disk Filer
8  REM  Save as RAMFILER
10  HOME :D$ =  CHR$ (4): PRINT D$;"PR#3"
20  PRINT D$;"SAVE/RAM/RAM"
30  PRINT "/RAM Disk Filer"
40  PRINT : PRINT "Type <C> for RAM CAT";A$
50  GET A$
60  IF A$ = "C" OR A$ = "c" THEN  GOTO 80
70  IF A$ <  > "C" AND A$ <  > "c" THEN  GOTO 130
80  HOME : PRINT D$;"CAT/RAM/PROGRAMS"
90  PRINT : PRINT "Type program name"
100  PRINT : INPUT "or <E> to end - ";B$
110  IF B$ = "E" OR B$ = "e" THEN  GOTO 130
120  PRINT D$;"RUN/RAM/PROGRAMS/"B$""
130  HOME : END
```

Listing 4. /RAM binary filer.

```
95  PRINT : PRINT "<B>inary programs"
115  IF B$ = "B" OR B$ = "b" THEN  GOTO 140
140  HOME : PRINT "Binary /RAM Disk Filer"
150  PRINT : PRINT "Type program name"
160  PRINT : INPUT "or <Q> to quit - ";ML$
170  IF ML$ = "Q" OR ML$ = "q" THEN  GOTO 130
180  PRINT D$;"BRUN/RAM/PROGRAMS/"ML$""
190  END
```

The utilities in **Listings 1** through **4** serve several functions. **Listing 1** protects the contraband areas with blank files at memory locations $2000–$3FFF and $4000–$5FFF, then runs **Listing 2**, a directory-making program. It lets you load as many files as you can fit into the 43K area remaining in the /RAM drive (84 blocks, or 85 minus one block for the PROGRAMS directory). **Listing 2** also runs the /RAM Filer program (**Listing 3**), which (after saving itself to /RAM as "RAM") catalogs the /RAM /PROGRAMS directory and lets you run any program you saved there previously. The directory takes up an additional block, leaving an 83-block (42K) pseudo disk drive.

RAM-DISK OPERATION

To use these RAM-disk utilities, first add the following short line to each Applesoft BASIC program you want to keep on the desktop:

1 PRINT CHR$(4);"SAVE/RAM/PROGRAMS */program name*"

This places your BASIC program in the RAM disk (under the PROGRAMS directory) whenever you run it. The program remains there even after you've switched it for another or the destructive NEW command takes it from RAM. Before engaging another application, simply type RUN/RAM /RAM to use programs in the /RAM /PROGRAMS directory.

Machine-language or binary-format programs require special handling. Don't use them with the RAM disk unless you're familiar with the CPU's memory map and know how to place these programs in safe areas of the map without overlapping them.

If you intend to use /RAM Filer with binary files, simply BLOAD the machine-language program and BSAVE it to /RAM/PROGRAMS */program name*,Axx,Exx (using the appropriate beginning and ending memory locations). To use the /RAM Filer utility with binary files, load the **Listing 3** /RAM Filer, type in **Listing 4**, and save it again as /RAM Filer.

Run the /RAM Filer utilities only once per computing session. After saving them, just type RUN RAMSTARTER to get underway. After that, since the catalog program remains in the RAM drive until a large enough program replaces it, it's available (as are your /RAM programs) whenever you type RUN/RAM/RAM.■

Write to Merle Harton, Jr., at 1525 St. Ann Place, Slidell, LA 70460.

Converting BASIC to Text

by Brian L. Zimmerman

Whenever you need to convert BASIC program files to ASCII text—for transmission via modem, say, or to load into your word processor for easier editing—the accompanying utility, BASIC to Text, can handle the job.

You'd normally add only lines 1–6 of **Listing 5** to the beginning of your BASIC file, then run it. But instead of typing in these six lines every time, you can use lines 10–70 to insert this utility automatically into your BASIC program.

First type in **Listing 5** and save it as BASIC2TEXT. Type RUN BASIC2TEXT,@10 to create the text file Text Maker on disk. Text Maker can convert any BASIC program to text format: LOAD your BASIC file; type EXEC TEXT.MAKER to add lines 1–6 of **Listing 5**; and RUN the program. Text Maker saves your BASIC program to disk as a text file called TEXT.FILE. You can then RENAME TEXT.FILE whatever you prefer.

Listing 5. BASIC to Text.

```
1 D$ =  CHR$ (4)
2  PRINT D$;"OPEN TEXT.FILE"
3  PRINT D$;"WRITE TEXT.FILE"
4  LIST 10 -
5  PRINT D$;"CLOSE TEXT.FILE"
6  END
10 D$ =  CHR$ (4)
20  PRINT D$;"OPEN TEXT.MAKER"
30  PRINT D$;"WRITE TEXT.MAKER"
40  LIST 1 - 6
50  PRINT D$;"CLOSE TEXT.MAKER"
60  REM  SAVE THIS PROGRAM AS BASIC2TEXT
70  REM  THEN TYPE 'RUN BASIC2TEXT,@10'
```

EXEC Text Maker into any BASIC program with a first-line number of 10 or greater. (If the number is less than 10, Text Maker may overwrite your program; you'd also have to change line 4.) To bring your program back into memory from TEXT.FILE, type NEW, then EXEC TEXT.FILE.

Creating Text Maker is even easier if you have a word processor. Just type lines 1–6, then print them to disk as an ASCII text file.

You can also use this technique to write and edit any BASIC program with your word processor. Print it to disk as a text file, EXEC it into memory, then save it back to disk as a BASIC program file.■

Write to Brian Zimmerman at 14732 Esther Lane, Chester, VA 23831.

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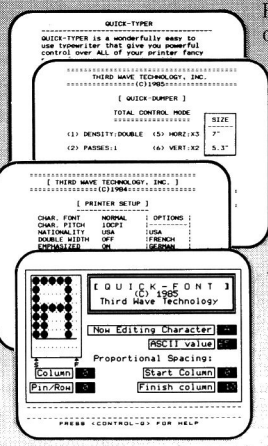

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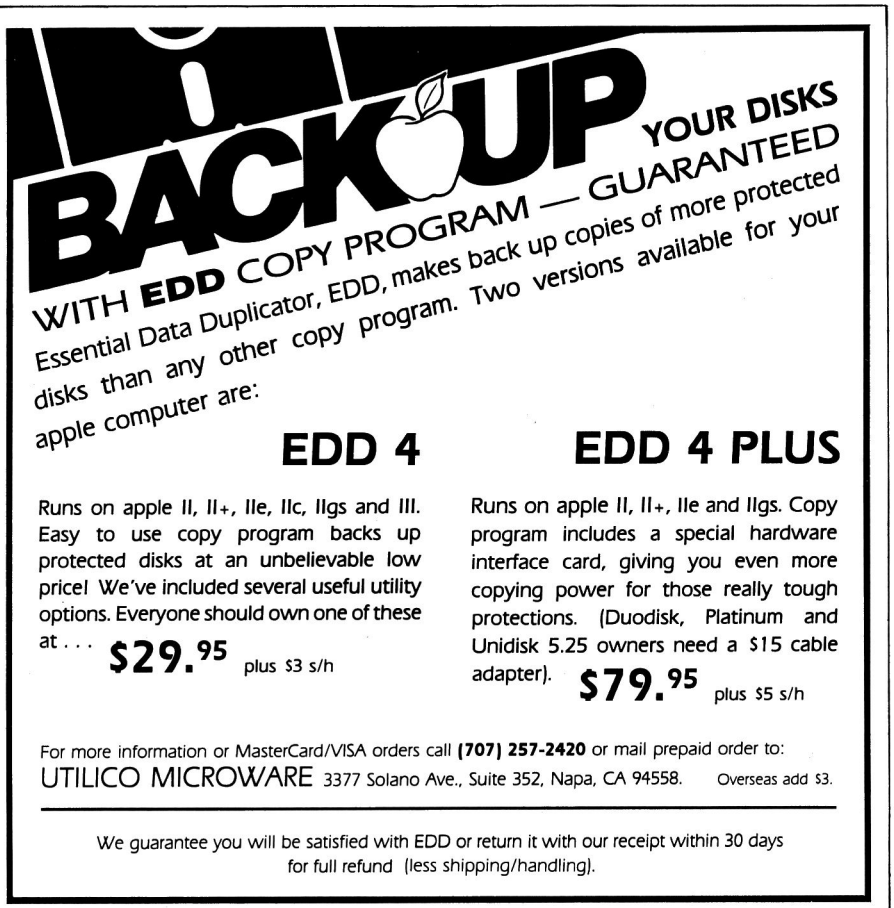
Listing 6. AppleWorks 2.0 patch for printing half-height subscripts and superscripts with the ImageWriter II.

```
100  REM  PROGRAM TO FIX IMAGEWRITER SUBSCRIPT AND SUPERSCRIP
     T CODES
110  REM
120  REM  BY PATRICK M. GORMLEY
130  REM  LAPEER EAST HIGH SCHOOL
140  REM  LAPEER, MI 48446
150  REM  MARCH 11, 1987
160  REM
170 D$ =  CHR$ (4)
180 PTH$ = "/appleworks/": REM   CHANGE PTH$ IF DIFFERENT FRO
     M /APPLEWORKS/
190  PRINT D$;"bload";PTH$;"seg.pr,tsys,a$2000"
200  FOR K = 9292 TO 9328
210  READ N: POKE K,N: NEXT
220  PRINT D$;"bsave";PTH$;"seg.pr,tsys,a$2000,13670"
230  PRINT D$;"bload";PTH$;"seg.ml,t$00,a$2000,b$16d11,l18"
240  FOR K = 8192 TO 8209
250  READ N: POKE K,N: NEXT
260  PRINT D$;"bsave";PTH$;"seg.ml,t$00,a$2000,b$16d11,l18"
270  DATA 2,27,120,0,0,0,0,0,2,27,122,0,0,0,2,27,121,0,0,0,2,
     27,122,0,0,0,0,0,0,0,0,0,0,0,0,0,0
280  DATA 17,73,109,97,103,101,87,114,105,116,101,114,32,50,3
     2,32,32,32
```

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Half-Height Subscripts

by Patrick Gormley

AppleWorks, including version 2.0, doesn't let you print half-height subscripts and superscripts with the ImageWriter II. Apple's *Using AppleWorks* manual lists the ImageWriter II among the printers AppleWorks 2.0 supports, though the printer isn't shown on that program's print menu. You can specify a custom printer, but you'll lose some of AppleWorks' printing features, such as proportional spacing.

The procedure below lets you change the ImageWriter codes in the AppleWorks 2.0 SEG.PR file to produce half-height subscripts and superscripts without configuring a custom printer. The ImageWriter printer codes in the SEG.PR file begin at $2446 and end at $2451 when you BLOAD the file at A$2000. The codes for subscripts and superscripts begin at $244C.

Each printer code consists of a string of hexadecimal numbers preceded by a length byte. By changing the codes in the SEG.PR file, you won't have to give up proportional printing to get half-height subscripts and superscripts. This patch not only places the correct printer codes in the SEG.PR file, but also changes the SEG.M1 file to list the ImageWriter II on the "Add a Printer" submenu. Use a backup copy of AppleWorks to make these changes.

From BASIC, type BLOAD SEG.PR,A$2000 and press Return. Type CALL -151 and press Return to enter the monitor. Now type the following code:

```
244C: 02 1B 78 00 00 00 00 00 02 1B
7A 00 00 00 02 1B 79 00 00 00 02 1B
7A 00 00 00 00 00 00 00 00 00 00 00
00 00 00
```

Press Return, then press Control-C and Return to reenter BASIC. Type BSAVE SEG.PR, A$2000,L3570 and press Return. Type BLOAD SEG.M1,A$2000,T$00,B$16D11,L18 and press Return.

Type CALL -151 and press Return to enter the monitor. Now type the following code:

```
2000: 11 49 6D 61 67 65 57 72 69 74
65 72 20 32 20 20 20 20
```

Press Return, Control-C, and Return to reenter BASIC. Now type BSAVE SEG.M1,A$2000,T$00,B$16D11,L18 and press Return.

If you'd rather not work in the monitor, the BASIC program in **Listing 6** will do the trick. You'll have to change the value of PTH$ in line 180 if your SEG.PR file isn't in the volume directory /APPLEWORKS, or if it's in a subdirectory. Enjoy your enhanced AppleWorks.■

Write to Patrick Gormley at Lapeer East High School, 933 South Saginaw Street, Lapeer, MI 48446.

ProDOS File Reader

by Harold D. Portnoy

Read File is a BASIC program (see **Listing 7**, or the accompanying data strip on p. 133) you use to read any ProDOS file. The program uses the global-page subroutine GOSYSTEM, which BASIC.SYSTEM uses to execute ProDOS machine-language interface (MLI) commands. The advantage of Read File is that parameter tables for the MLI calls are already set up in the global page.

Read File's poke.input subroutine (lines 50000–50060) POKEs the filename directly into the area in memory (starting at 48316) where GOSYSTEM expects to find it. Use poke.input wherever you must enter information directly from the keyboard. The subroutine in lines 50070–50090 converts the data in memory to a string or numeric variable.

Read File uses the MLI commands GETFILEINFO, GETEOF, OPEN, READ, and CLOSE. Some of the commands require you to fill in parts of the parameter table, in addition to the filename, before calling GOSYSTEM. The program POKEs these values into the parameter table (lines 60–130). Read File invokes GOSYSTEM by POKEing the appropriate command number into memory location 69 (the dummy accumulator register), then POKEs the low and high GOSYSTEM address bytes into locations 58 and 59, followed by a call to the monitor GO subroutine at $FEB9 (line 290). This is equivalent to loading the accumulator with the MLI command number and jumping to GOSYSTEM.

The program begins by printing the file type and auxiliary type code (obtained from GETFILEINFO), and the file length (from GETEOL, after first opening the file with OPEN). READ transfers the file from disk to memory,

Listing 7. RD.FILE.

```
10  REM   Read file/poke input....by Harold D. Portnoy
20  ONERR  GOTO 270
30  PRINT  CHR$ (4)"PR#3"
40 PP = 48316:LN = 64:BN = 31:EN = 127:TYP$ = "File name":
   REM   Poke pathname into TXBUF for GOSYSTEM
50  HOME : GOSUB 50010: GOSUB 50080: PRINT : IF CTR < 1 THEN
   270
60 GFI = 48820:O = 48843:GE = 48838:R = 48853: REM Start of
   GET_FILE_INFO, OPEN, GET_EOF, READ
70  POKE GFI + 4,0: REM Set up path not found error
80 AC = 196:SL = 112:SH = 190: POKE GFI,10: GOSUB 290: REM
   GET_FILE_INFO
90  IF  PEEK (GFI + 4) = 0 THEN 270: REM #Error
100 AC = 200: GOSUB 290: REM OPEN
110 AC = 209:RN =  PEEK (O + 5): POKE GE + 1,RN: GOSUB 290:
   REM  GET_EOF using reference number from OPEN
120 FL =  PEEK (GE + 4) * 65536 +  PEEK (GE + 3) * 256 +
   PEEK (GE + 2): REM  Calculate file length from GET_EOF
130 AC = 202: POKE R + 1,RN: POKE R + 2,0: POKE R + 3,32:
   POKE R + 4, PEEK (GE + 2): POKE R + 5, PEEK (GE + 3):
   GOSUB 290: REM Read reference number, buffer pointer,
   number of bytes
140 AC =  PEEK (GFI + 4):SL = 227:SH = 164:PL = 533:CTR = 3:
   GOSUB 290: GOSUB 50080: REM Get aux type abbreviation
   from catalog S/R
150  VTAB 1: HTAB 39: PRINT "Aux type = $";:AC =  PEEK (GFI
```

Listing continued.

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Listing continued.

```
    + 6): POKE 70, PEEK (GFI + 5): SL = 65:SH = 249: GOSUB
    290: PRINT : REM #Poke aux type into A and X and call
    PRNTAX
160  PRINT "File type = ";ST$;: HTAB 39: PRINT "File length
    = ";FL
170 HY$ =
"-------------------------------------------------------------
--------------------"
180  PRINT : VTAB 3: PRINT HY$: VTAB 23: PRINT HY$;: VTAB 1
190  PRINT : VTAB 24: PRINT " Control-S: Stop.   Any key:
    Start.    Control-C: End";: VTAB 1
200  POKE 34,3: POKE 35,22: VTAB 4: PRINT : REM  Set window
210 ST = 8192: REM # Start at page $20
220  FOR N = ST TO ST + FL
230 A =  PEEK (N): IN = 255: IF A < 32 THEN A = A + 64:
    INVERSE : GOTO 250: REM   Get character. Print control
    character (hi bit off) as inverse uppercase character
240  IF A > 127 AND A < 160 THEN A = A - 32: INVERSE : REM
    Print control character (hi bit on) as inverse
    lowercase character
250  PRINT  CHR$ (A);: NORMAL : IF  PEEK (1403) = 79 THEN
    PRINT : REM  Print character
260  NEXT : PRINT : PRINT : GOTO 270
270 AC = 204:SL = 112:SH = 190: GOSUB 290: REM Close files
280  PRINT : PRINT : GET A$: TEXT : NORMAL : HOME : END
290  POKE 69,AC: POKE 58,SL: POKE 59,SH: CALL  - 327: RETURN
    : REM #Poke into accumulator and call GO
50000  REM   Poke.input subroutine. Before calling define PP
      (Poke position), LN (input length), BN (ASCII of
      beginning character), EN (ASCII of end character),
      TYP$ (type of input)
50010 CTR = 0:PL = PP + 1: REM  Initialization
50020  PRINT TYP$;": ";
50030  GET A$:A =  ASC (A$): ON A = 13 GOTO 50060: ON A = 8
      GOTO 50050: ON A > BN AND A < EN GOTO 50040: GOTO
      50030
50040  ON (CTR > LN - 1) GOTO 50030:CTR = CTR + (CTR < LN):
      PRINT A$;: POKE PL,A:PL = PL + 1: GOTO 50030
50050  ON CTR < 1 GOTO 50030:CTR = CTR - (CTR > 0): PRINT
      A$;" ";A$;:PL = PL - 1: GOTO 50030
50060  POKE PP,CTR: RETURN : REM Number of characters before
      string for ProDOS
50070  REM   Byte to string and number converter
50080 A = 0:ST$ = "": ON CTR < 1 GOTO 50090:PL = PL - CTR:
      FOR N = 1 TO CTR:A$ =  CHR$ ( PEEK (PL)):ST$ = ST$ +
      A$:PL = PL + 1: NEXT :A =  VAL (ST$)
50090  RETURN
```

End of listing.

and lines 220–260 print it to the screen. The program displays control characters in inverse type—characters zero to 31 in uppercase, characters 128 to 159 in lowercase.

To copy the program, get out your word processor, type in **Listing 7**, and save it as a text file. EXEC the text file, and RD.FILE will be saved to disk. Try reading an AppleWorks word-processor file with RD.FILE. With a little studying, you'll be able to decipher the way each line of text is stored.

Write your own program to read a word-processing file, or use RD.AWP from "AWP-File Reader" (August 1987, p. 100).■

Write to Harold Portnoy at 1431 Woodward, Bloomfield Hills, MI 48013.

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UNNEW

by Matt Britz

If you've ever typed NEW inadvertently when you really wanted to type SAVE at the end of a long session of BASIC programming, don't give up—UNNEW, the machine-language routine in **Listing 8**, can bring back your file.

Listing 8. UNNEW.

```
      00 01 EF D8 00
*300L

0300-   A0 05        LDY   #$05
0302-   B9 00 08     LDA   $0800,Y
0305-   C9 00        CMP   #$00
0307-   D0 15        BNE   $031E
0309-   C8           INY
030A-   8C 01 08     STY   $0801
030D-   A2 08        LDX   #$08
030F-   8E 02 08     STX   $0802
0312-   EA           NOP
0313-   A2 01        LDX   #$01
0315-   8E 03 01     STX   $0103
0318-   A2 08        LDX   #$08
031A-   8E 04 01     STX   $0104
031D-   60           RTS
031E-   C8           INY
031F-   4C 02 03     JMP   $0302
0322-   00           BRK
0323-   00           BRK
0324-   00           BRK
0325-   00           BRK


*300.322

0300- A0 05 B9 00 08 C9 00 D0
0308- 15 C8 8C 01 08 A2 08 8E
0310- 02 08 EA A2 01 8E 03 01
0318- A2 08 8E 04 01 60 C8 4C
0320- 02 03 00
```

The NEW statement changes the address of the end of the first program line to zero. For example, the following two lines show what a BASIC program looks like from the monitor:

```
800- 00 0B 08 BA 22 4D 41 54
808- 54 22 00 00 00
```

Bytes $801 and $802 tell the pointer where to go after the first program line executes. When you type NEW, these bytes change to zero:

```
800- 00 00 00 BA 22 4D 41 54
808- 54 22 00 00 00
```

Your program is still in memory, but the pointer can't find its address. UNNEW finds the address of the end of the first program line and rewrites it to locations $801 and $802 in the example.■

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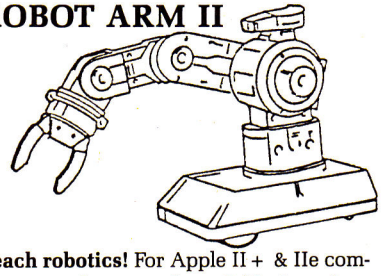

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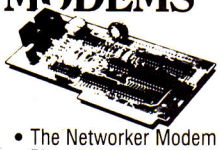

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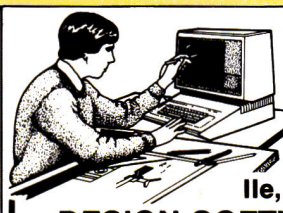

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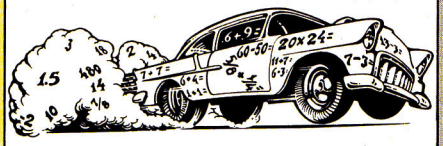

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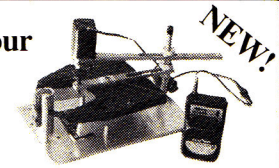

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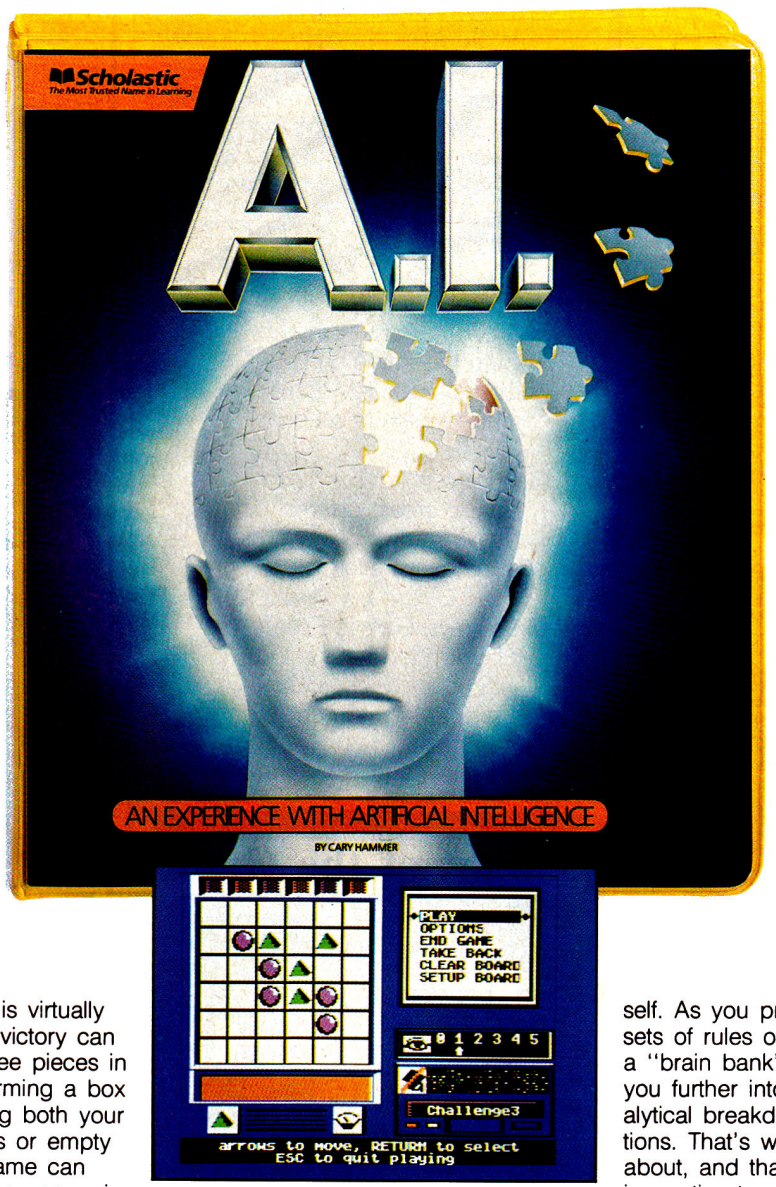


The program runs on a one-disk 128K IIe or IIc, though the extra speed of a IIGS helps. Basically, you and A.I. take turns placing game pieces on a grid (adjustable from 3-by-3 to 6-by-6 spaces). The number of possible games is virtually endless, since the goal for victory can be as simple as putting three pieces in a row or as complex as forming a box or diamond pattern involving both your and your opponent's pieces or empty squares. What's more, a game can have up to four goals, so you can win with either a triangle pattern or four-piece diagonal, and so on.

The first of the logically ordered exercises in the A.I. manual challenges you to play a simple game without knowing the rules—to try to figure out the winning pattern from A.I.'s successes.

Next, you turn the tables, playing games of your own invention, telling A.I. when somebody wins, and watching the program scan the board, mark the squares it's considered so far, place its pieces, and analyze finished games with blinking graphics and tap-dancing noises.

Various commands let you specify who goes first and the number of moves A.I. plans ahead (reducing speed glacially). A "brain scan" function lets you see A.I.'s current hypotheses of winning patterns, automatically revised until the program starts beating you at your own game.

If you can't wait for A.I. to learn a game, you can program it directly, defining goals (including some too complex for A.I. to learn through play) and letting A.I. rate the desirability of moves or assigning ratings yourself. As you program, play, and save sets of rules or "brains" (a data disk is a "brain bank"), the program takes you further into game logic and the analytical breakdown of tasks or situations. That's what computers are all about, and that's why A.I. is the most innovative teaching tool we've seen this year.

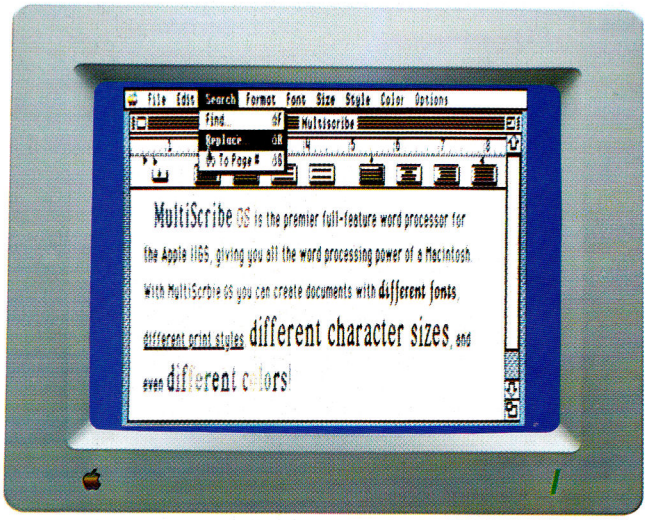
A.I. is published by Scholastic Software (730 Broadway, New York, NY 10003, 212-505-3000). The home version costs $49.95; the classroom edition with teacher's guide is $87.45. ■

Here's more you can do with the new Apple II.

Spectacular Vernacular.

MultiScribe GS™

StyleWare introduces **MultiScribe** GS, the first of a new generation of word processors for the 512K Apple® IIGS.™ Like other StyleWare products, this new program was designed for ease of use, versatility and creativity. Using the super high resolution bit-mapped graphics, enhanced processor speed, and expanded memory of the IIGS, **MultiScribe** GS gives you advanced features such as multiple windowing, color printing and enlarged document size capabilities (print documents as large as memory allows!), creating spectacular writing possibilities.



The hand is almost as quick as the eye!

The fast, easy to use pull-down menus, scroll bars, windows, and dialog boxes of the famous Macintosh™ interface let you change your document as easily as you change your mind. Choose from a variety of type styles, character sizes, fonts, and colors to fit your needs.

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Each character size and print style appears on screen exactly as it will when printed. And **MultiScribe** GS offers near letter quality font-based printing on an ImageWriter II™ and near typeset quality with a LaserWriter™ – giving your work a clean, neat, professional appearance.

Powerfully Professional.

Designed with the serious user in mind, **MultiScribe** GS is the only word processor you'll ever need for the IIGS:

- AppleWorks™ compatible
- Works with all major Apple IIGS graphics programs including **TopDraw** and Deluxe Paint™
- Print in color on an ImageWriter II

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TopDraw™

For those thoughts that just can't be put into words, StyleWare has created **TopDraw**. Like **MultiScribe** GS, **TopDraw** is designed to challenge the capabilities of Apple's new IIGS. And **TopDraw** does it with even more color – 4096 colors to be exact!

The shape of things to come!

The first object-oriented graphics program for the IIGS, **TopDraw** gives you the ability to create drawings based on shapes, or objects, which can be moved, edited and duplicated – giving you virtually limitless drawing potential.

The color of creativity!

Use **TopDraw**'s editing function to edit colors and patterns. Draw with up to 16 colors at once, using color patterns as pen colors or fill patterns, and create millions of color combinations. And because creativity isn't always limited to an 8½ x 11 inch page, **TopDraw** lets you print your creations up to 8 pages in length and width.

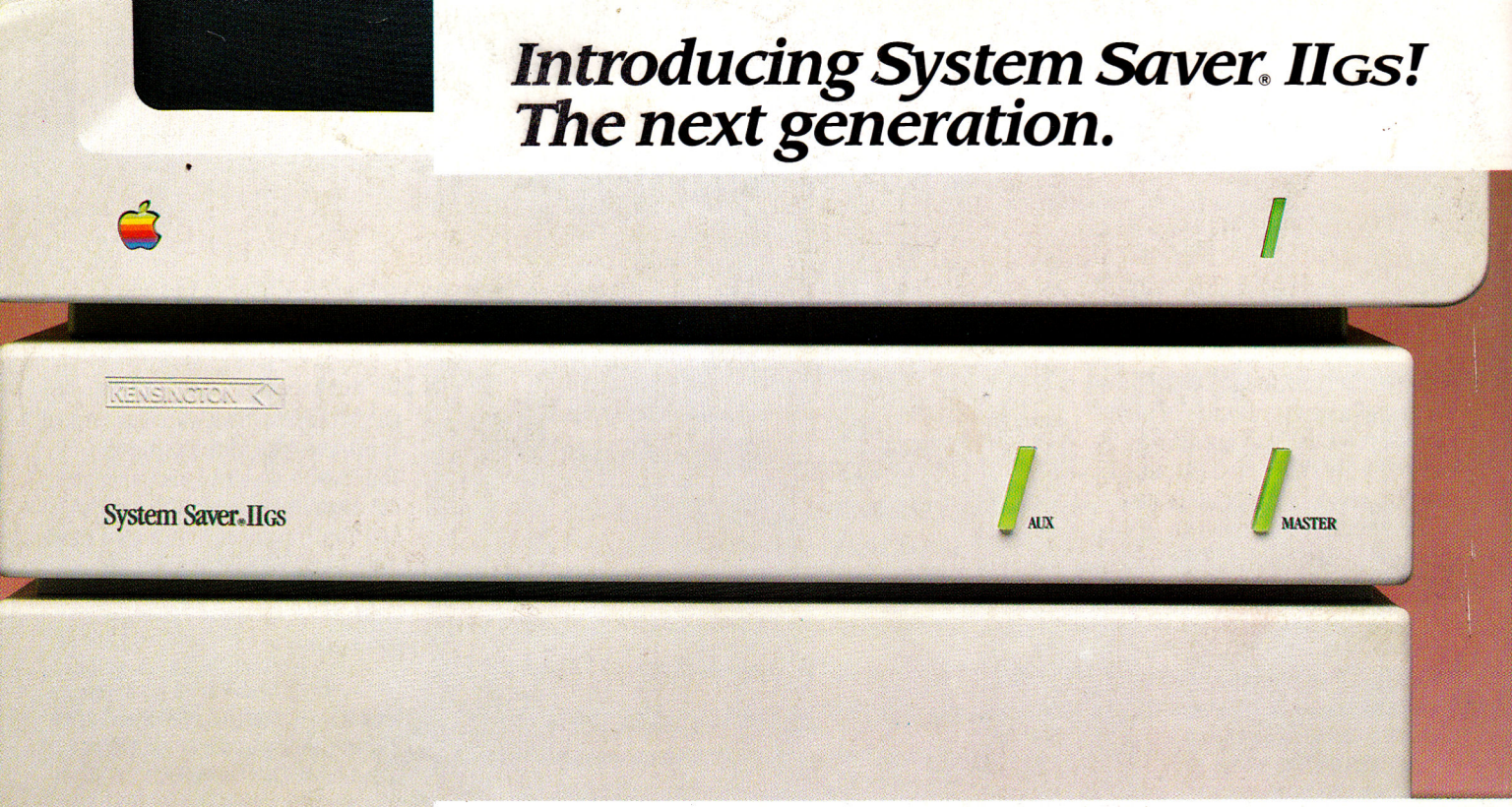
Get serious.

TopDraw is complete with user-defined rulers (metric and English), grids, pens, ellipses, rectangles, rounded rectangles, polygons and freehand objects, horizontal, vertical, diagonal lines, free-form lines, and arcs – and lets you print in multiple colors on an ImageWriter II. And because **TopDraw** uses object-oriented graphics, its professional-quality LaserWriter output is superior to that of the bit-mapped graphics of paint programs.

Seeing is believing!

See **TopDraw**, **MultiScribe** GS, and all the other creative StyleWare products at your authorized StyleWare dealer.

Introducing System Saver® IIGS! The next generation.

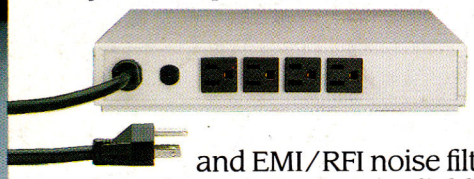


Apple IIGS

Years ago, when Apple introduced the first Apple® II, we thought it needed a little help. Over ¼ million Apple II users thought so too. That's why they chose our original System Saver to organize, protect and cool their computers.

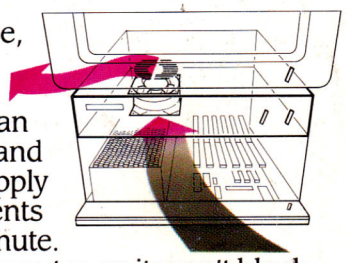
When Apple brought out their next generation Apple IIGS, we thought it deserved the same good treatment. That's why we're proud to announce *our* next generation—System Saver IIGS.

System Saver IIGS organizes your power with four outlets for your computer, monitor, and two peripherals. And it puts everything at your fingertips with two front-mounted switches. (One switch controls your computer and monitor. The other controls your peripherals.)



System Saver IIGS also protects your valuable equipment and data from dangerous power surges, spikes and noise. Surge suppression circuitry* clips surges and spikes at a safe level, and EMI/RFI noise filtering smooths out disruptive line noise to make your IIGS more reliable and longer lasting.

Best of all, System Saver IIGS keeps your Apple cool—more quietly and efficiently than the optional internal fan offered by Apple. How? Well, the bottom of the System Saver IIGS forms a seal with the top of the IIGS case, so its whisper-quiet fan draws air *up and through* your computer, instead of just pushing it around inside. More powerful than the Apple fan, it pulls air through the back and bottom vents of the IIGS, over the power supply (the primary source of heat), and out the vents in the top at the rate of 17 cubic feet per minute. And there's nothing to install inside the computer, so it won't block two slots like the Apple fan.



System Saver IIGS, $99.95, is available at Apple dealers everywhere. For a dealer near you, or for more information, call toll-free (800) 535-4242. In NY, call (212) 475-5200.

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*Meets IEEE 587-1980 Category A & B specifications © 1987 Kensington Microware Ltd.

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