THE APPLE II MAGAZINE

inCider

A CWC/I PUBLICATION

USE APPLEWORKS: Merge Spreadsheets with Letters pg. 68

April 1987
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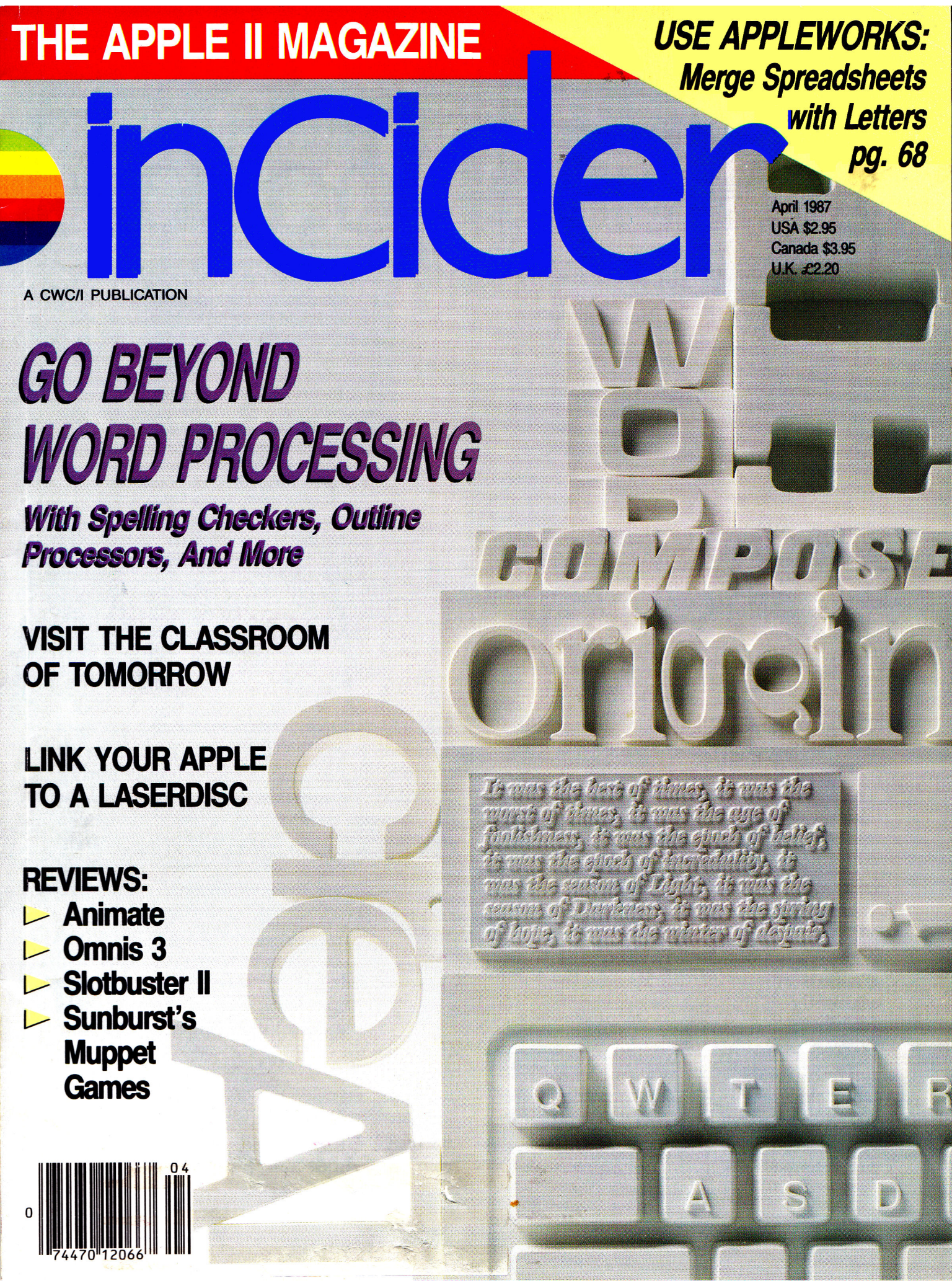

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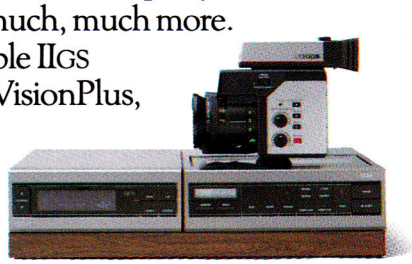

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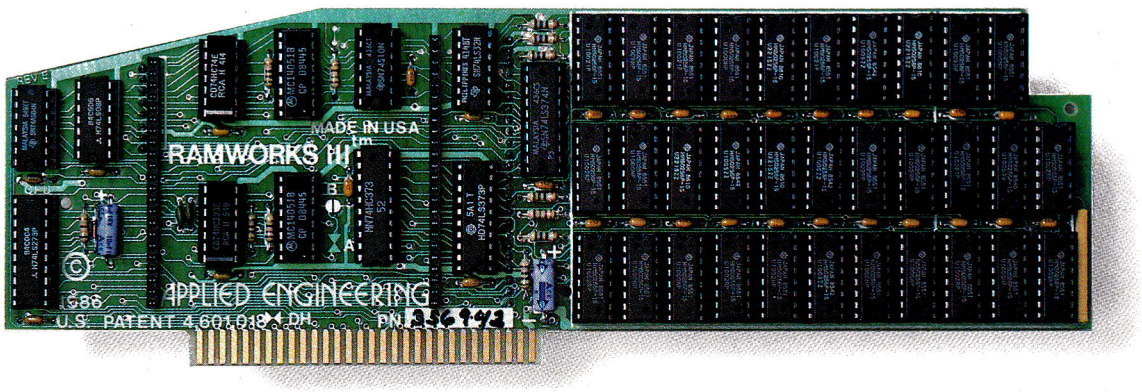
Patented Performance from the Recognized Leader



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 #4601081) 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.

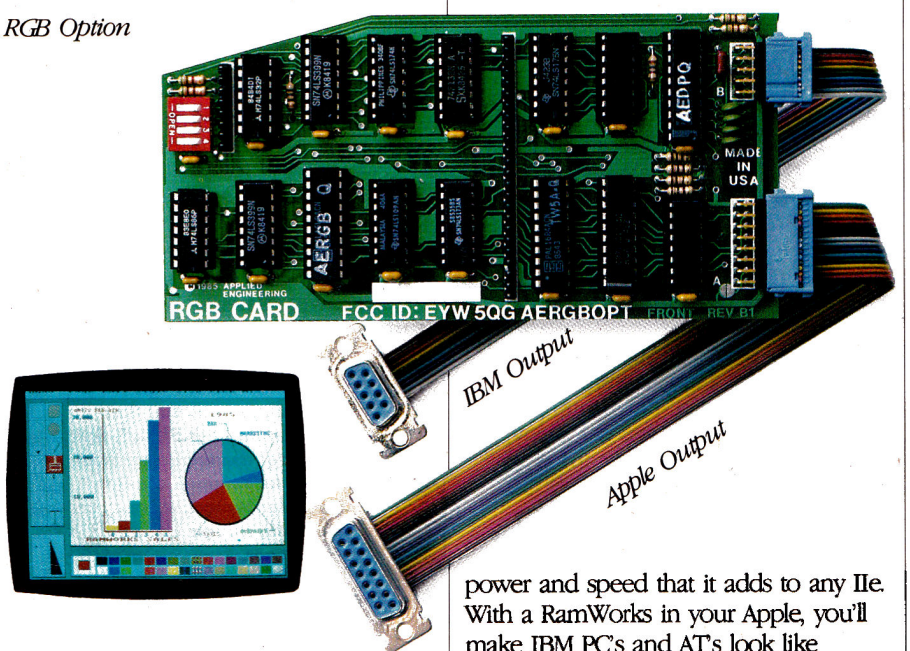
If you've got some other RAM card that's not being recognized by your programs, and you want RamWorks III, you're in luck. Because all you have to do is plug the memory chips from your current card into the expansion sockets on RamWorks to recapture most of your investment!

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
- 5 year hassle free warranty
- Built-in super sharp 80 column display, (U.S. Patent #4601081)
- 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
- Powerful linear addressing 16 bit coprocessor port
- Automatic AppleWorks expansion up to 3017K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
- RamDrive™ the ultimate disk emulation software included free
- Memory is easily partitioned allowing many programs in memory at once
- 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 #4601081)
- Takes only one slot (auxiliary) even when fully expanded
- Socketed and user upgradeable
- Software industry standard
- Advanced Computer Aided Design
- Used by Apple Computer, Steve Wozniak and virtually all software companies
- Displays date and time on the AppleWorks screen with any PRO-DOS compatible clock
- Much, much more!

RamWorks III with 64K	**$179**
RamWorks III with 256K	**$219**
RamWorks III with 512K	**$269**
RamWorks III with 1 MEG	**$369**
RamWorks III with 1.5 MEG	**$539**
RamWorks III with 2 to 16 MEG	**CALL**
65C816 16 Bit Card	**$159**
RGB Option	**$129**
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Pinpoint with RAM Enhancement Software	**$79**
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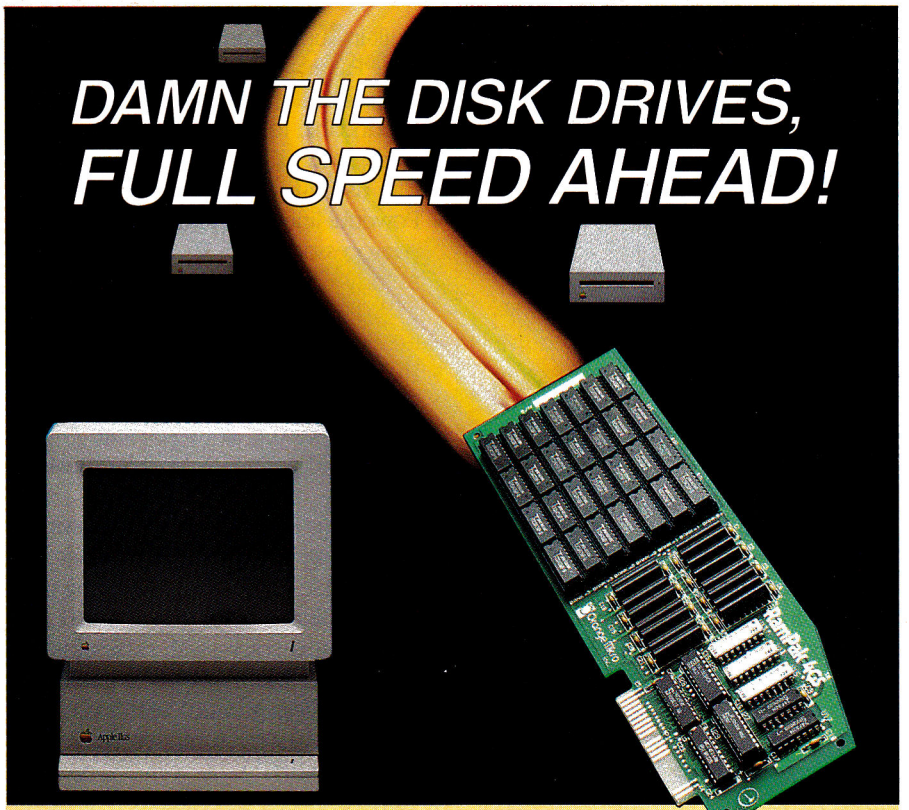

Up to 350% faster than common memory cards for most applications.*

Your disk drive can torpedo performance

When your computer pauses to access data from the disk drive, you slow down. Adding a RamPak 4GS Memory Subsystem reduces your dependence on the disk drive and speeds up your Apple IIGS. The RamPak 4GS allows your Apple® IIGS to reach its full potential as a powerful computing system. With a standard memory of 512K, the RamPak 4GS can easily be expanded to 4 megabytes, giving you unprecedented processing capabilities.

RAM power, not just RAM expansion

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Available now at your local Apple Dealer

The RamPak 4GS is an important part of any Apple IIGS system. You can relax knowing that it's from Orange Micro. With seven years in the Apple enhancement business, we are recognized as the leader for innovative products and excellent support. Ask your dealer for the RamPak 4GS and go full speed ahead with your Apple IIGS.

*Benchmark conducted against Apple Memory Expansion Card and Applied Engineering RamFactor, using AppleWorks software.

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inCider

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A word processor can't make you more creative, but one of these word-processing accessories can make you a more effective writer.

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Here's a little trick that lets you stamp your Apple Writer files with the date and time, and add a RAM disk to boot—with no additional hardware or software.

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With a IIe in the classroom and a IIc at home, students involved in the Apple Classroom of Tomorrow project are experiencing life in the computer age.

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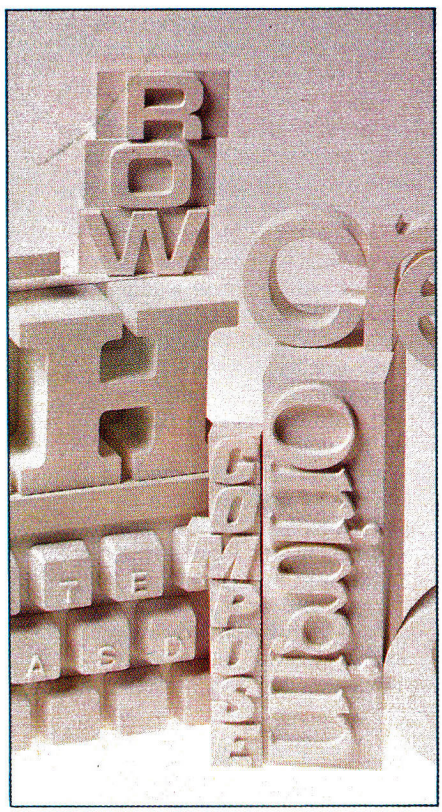
Discover the power of interactive video by interfacing your Apple II to a videodisc player.



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It's Not as Easy as You Think

by Deborah de Peyster, Editor in Chief

"Unless there's a will, not even the best software provides the way."

It's easy to get caught up in the promise of software. I was recently intrigued by an ad that showed a svelte young woman, looking fit and happy, running through open fields. The ad was for a running program that seemed to promise me the same health and fitness if only I'd give it a chance. I did. I decided to give a number of other running programs a chance, too. (That review will appear in a summer issue of *inCider*.) Much of their promise was true. Some of the packages include books of advice on improving speed and distance; others help you keep electronic track of your mileage and performance; still others analyze your running data and plan a better training program for you.

But (and this is a big but) none made it any easier to get out of bed on those below-freezing, snowy New Hampshire mornings. And none made my legs move through my four-mile course with any greater ease. Did that first program deliver me the body and attitude of the commercially advertised runner? No—at least not yet. But at least I know how far I have to go: This particular program charts your progress, weight, and training, graphically.

Another ad recently caught my attention. It was a photograph of an elegant place setting with a delicious meal prepared with the aplomb of a chef from the Cordon Bleu. Dinner at Eight, from Rubicon Publishing, was the software program that seemed to promise me the same. Now that sounded great. Dinner at 9:30 served from a boiled plastic package is my style these days, but the other me has always wanted to live an elegant Dinner at Eight lifestyle.

But (there's that but again) even this program's help in meal planning, shopping, and recipe ideas doesn't get me over the hurdle of hating to cook. I need something that will actually help me stir the pot to keep things from boiling and watch the oven to keep things from turning black. Not even my mother, who devoted 20 painstaking years to the task, was able to find the chef in me. The reality is this: Unless there's a will, not even the best software provides the way.

Even the promise of a spreadsheet can mask potential problems. Take AppleWorks, which I use every day and find helpful and easy to operate. I've devised some clever spreadsheet formulas to help me assess the best way to spend our editorial budget. With the speed of greased lightning I can see the impact of that special trip to the West Coast or ordering six new Apple IIGSs.

The only problem is that my cleverness with formulas doesn't always make them correct. I had an inkling something was amiss when one purchase of a $49.95 coat rack tipped the budget into serious deficit for the year. I'd gotten a little too glib with my powerful spreadsheet—I'd credited it with the power to do everything accurately as well as quickly. I'd forgotten that it is I who must enter the data and may therefore cause the whole thing to go awry.

My favorite example of the promise of software obscuring reality comes from word processing. *inCider* often receives letters from people who believe that a talented writer is nothing more than a good word-processor operator. One particular author has the habit of just adding more thoughts at the end of the letter he sent last. Thus every correspondence contains a capsulization of our last chat with him.

Somehow if a thought has appeared on a computer screen and been printed, it seems to some people to have achieved greater importance. But needless to say, a good word processor a good writer does not make.

And that's the message here. The microcomputer industry has made major leaps in the past few years in making software easy to operate and useful. But don't be fooled. Ease of operation and usefulness can only go so far. It still takes a lot of commitment to a task and the desire to get something done to make the undertaking worthwhile. ■

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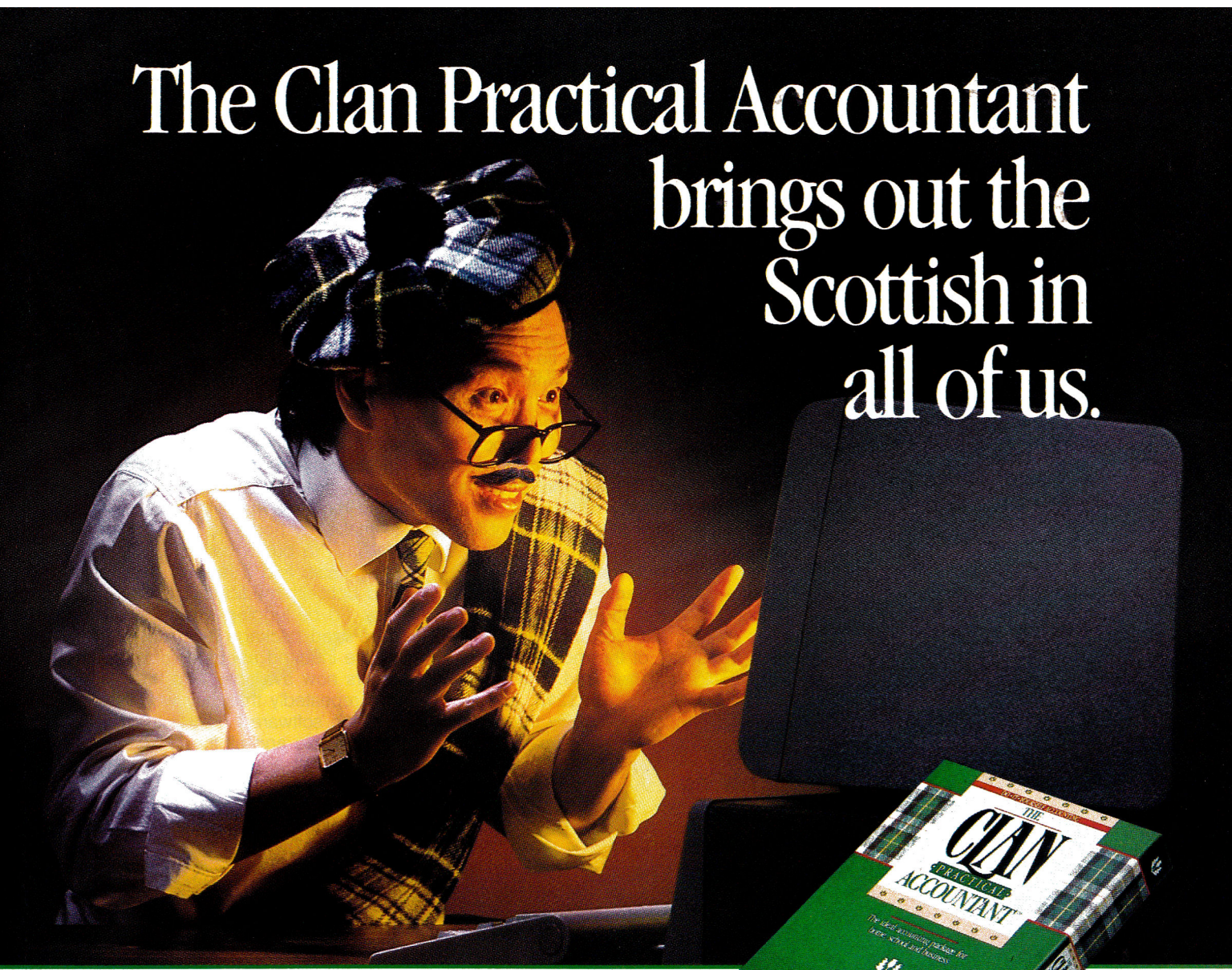

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LETTERS

The Results Are In

The polls in your December 1986 issue ("People's Choice," p. 42, and "Experts' Choice," p. 50) produced some very interesting results. The popularity of certain programs gives readers confidence in them and helps readers make purchases free of aggravation.

I recently purchased Springboard's Graphic Expander to work with The Print Shop. It turned out to be a piece of The Newsroom without any of The Print Shop's capabilities. The typestyle section is awkward, and the drawings are crude and heavy-handed compared to The Print Shop's. I sent it back for a refund; the results of a poll would have helped me avoid an error in judgment.

I'd like to bring your attention to page 54, where "Kramer wished there were a II equivalent of the Macintosh product ThunderScan, an optical scanner that replaces the ImageWriter ribbon cartridge and transfers a graphics image to the computer for use as clip art."

Now turn to page 180 of the same issue, and find an ad for Scannit under "Digitizers." I have no idea if this device is any good and would appreciate an evaluation of its capabilities. Here's an answer for users who want to digitize drawings and photos without elaborate video cameras.

Bernard S. Kobrin
11 Hillcrest Road
Woodcliff Lake, NJ 07675

Look for inCider*'s evaluation of Scannit, our February 1987 Editors' Choice, p. 128 of that issue. —eds.*

A Little Extra

I enjoyed your article, "Laser 128: An Affordable Compatible," in the December 1986 *inCider* (p. 58). Unfortunately, two areas weren't addressed—reliability and cost of repairs.

I purchased my Laser 128 from Central Point Software in February 1986. From the very start there was a problem with the disk drive. It could read most Apple software, including BASIC programs and AppleWorks files created on my IIe, but the IIe couldn't read files and programs written on the Laser.

I purchased a second drive for the Laser and, fortunately, my IIe could read files written to this drive. In September, though, the internal drive began trashing all my disks, so I returned the Laser to Central Point for repair.

After I'd made many lengthy phone calls to Central Point Software, it concluded that the disk controller was at fault. The disk controller, however, was part of the motherboard and couldn't be repaired. The fix was a new motherboard at $215, and the warranty expired after only three months. The Laser was repaired and returned almost six weeks later.

The cost of the Laser, which is only seven months old, had now increased to $610. I could have bought an Apple for this kind of cash. My Apple IIe is almost four years old and has never given me trouble.

I hope this case is unusual, but it shows what can happen. I'd recommend spending your money on an Apple and let those who can afford it buy the Laser 128.

Wayne Blackwell
9826 Sagedale
Houston, TX 77089

Something's Missing

Either something's missing or I've been looking in all the wrong places. After researching the variety and quality of software available for school applications, I selected an enhanced Apple IIe and an Epson LX80 printer for my high-school classroom. I use them for instructing and evaluating students, and for generating the kinds of statistical reports everyone seems to want these days. I've found some terrific programs for this system, and am very pleased with the results my students and I have achieved.

I selected an Apple IIc and an ImageWriter printer to use at home. I can run all my software on both machines, letting me do work at home that would otherwise tie me to my classroom keyboard for hours after the usual school day.

And now the problem—between the classroom and home, all my software is useless. In the principal's office, the counseling center, or the faculty room, I have no way to access the information I've stored so meticulously on my floppy disks. The school district's computer system isn't even remotely Apple-compatible, and to make my home IIc truly portable, I'd have to buy a battery pack, a carrying case, and a hellishly expensive and optically mediocre flat-panel display. I'd be lugging around a suitcase-sized package everywhere I go.

I've inquired about laptop computers now available, and have been told repeatedly that they won't work with the software I use. Is this true? Have Apple and all the clone manufacturers left a laptop-sized hole in the computer-hardware market? I find this hard to believe, but I've had no luck in my search. Is something truly missing?

Brian A. Racy
421 Bellevue Avenue East, #401
Seattle, WA 98102

Unfortunately, there are no Apple-compatible "laptop" computers. A souped-up Apple IIc is the most portable machine in the Apple family. See "The IIc—From Here to Hong Kong" (August 1986, p. 38) to see how one traveling businessman made the jump to portability with his IIc. It's more expensive, but it seems to work well. —eds.

It Can Be Done

The introduction of Apple's amazing new IIGS brings one question to mind: Hasn't Apple learned? In this day when the cheapest MS-DOS machine carries 640K and the Mac Plus holds a full megabyte, why build a machine with only 256K, especially when it can address up to 8 megabytes? Considering its advanced graphics and sound capabilities, which are heavy memory users, 512K would be a minimum.

The IIGS would quickly use up 512K of memory, so the expansion-card market would still be there. The small-memory problem is apparently the machine's only flaw, and it almost

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seems to be an Apple tradition. (The Apple II Plus started out with 16K.)

On a brighter note, the machine's abilities seem limitless. I can envision a foreign-language program displaying a picture of an item with its English and foreign names on screen (perhaps with a pronunciation breakdown and dual-language dictionary definitions), then the computer saying the word in both languages, thanks to the Ensoniq chip.

Then there's the fast-growing world of CAD (computer-aided design). The IIGS is ideal for this, as all the requirements—fast processor, large memory (if expanded), great graphics, mouse, and multiple-I/O capability—are built in. Now if only Apple would let that machine out. I haven't seen the GS advertised since its introduction in September.

The only other thing I wonder about is the expansion-slot configuration; I know it's Apple II-compatible, but are peripherals available that use the IIGS' 24-bit address bus and sound and graphics abilities? I understand that the Ensoniq chip delivers stereo, but only inside the machine. Perhaps Apple has dropped some less-useful slot hookups—eliminating some older cards from use—in favor of these advances, but it's probably worth it. Apple should have put in dual or expanded slots so that you could use either technology.

Of course, the IIGS is a whole new machine for Apple. Even the Apple II wasn't perfect for its time. What's next, a GS Plus, then a GSe?

Don't be surprised if the new Mac is more than hardware-compatible with the IIGS. If the 16-bit GS can emulate the 8-bit IIe, the 32-bit Mac may well emulate the GS. Remember, software that lets you run IIe programs on the Mac and a board for the Apple III that lets you run II programs are already available. Why no one has made a IIe-emulation board for the II Plus, I don't know. It can be done, of course. That's what Apple has taught us over the years—it can be done.

Dr. M. Beebe
28 Elm Street
Geneseo, NY 14454

Solar Power

Your readers may be interested to know that the IIc is a 12-volt device that can run on virtually any unregulated 9- to 16-volt DC power source. The machine is easy to set up for portable, mobile, emergency, or solar-power applications. The uninterruptible nature of battery power renders such a system virtually immune to brownouts or blackouts.

My shop and office are powered entirely by a 12-volt photovoltaic (solar) power system, into which my IIc is plugged directly, without its external power supply. I usually leave it on 24 hours a day so that I don't have to reload all the programs and data. This system has operated flawlessly for a year now. The computer's power regulator handles substantial voltage fluctuations perfectly.

To convert your IIc, cut the low-voltage (output) cable a few inches from the power supply and install a cigarette lighter or other polarized plug onto the cable from the computer. Install matching sockets onto the power-supply cable and your battery-power source. (If your Apple

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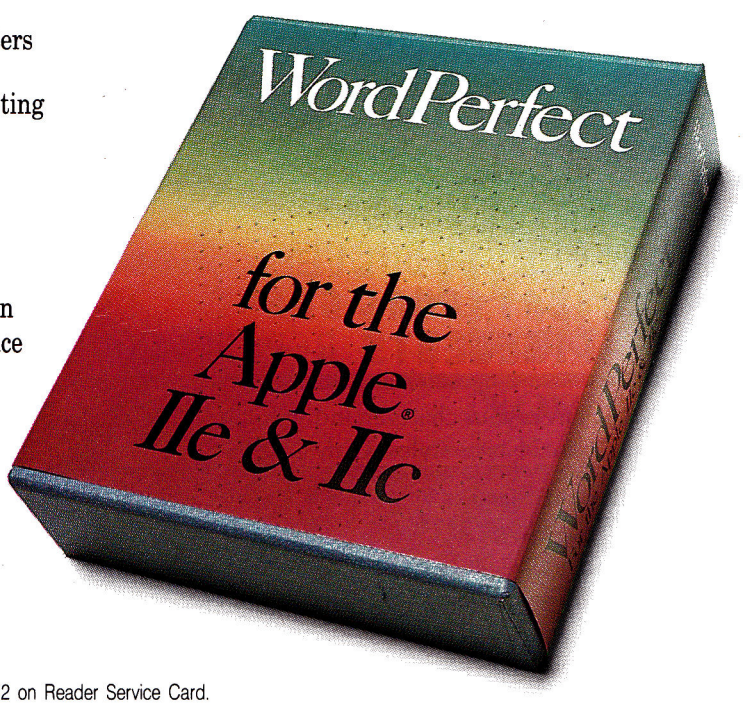

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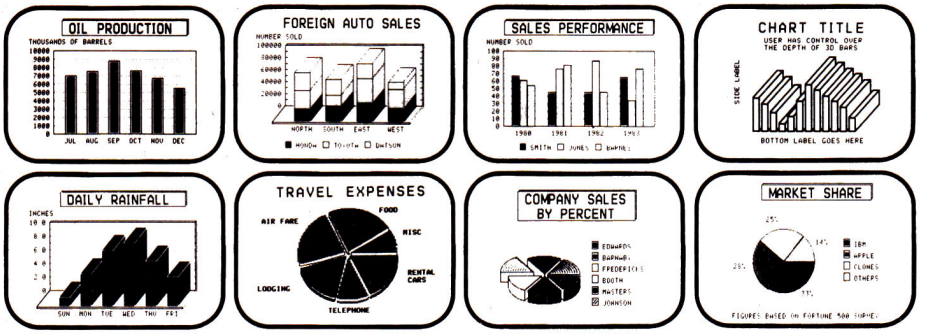

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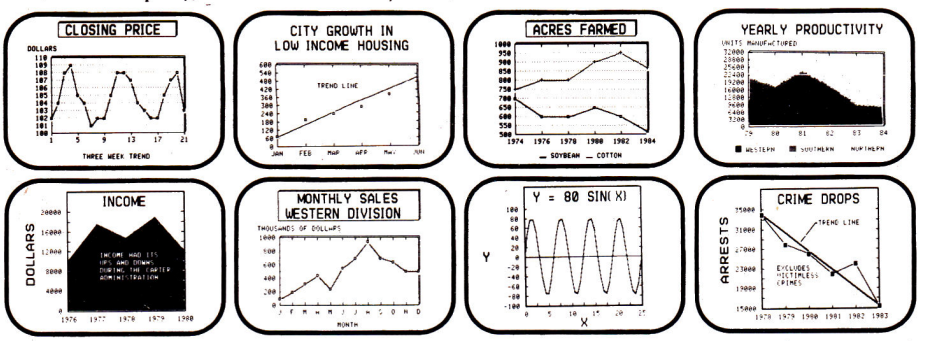

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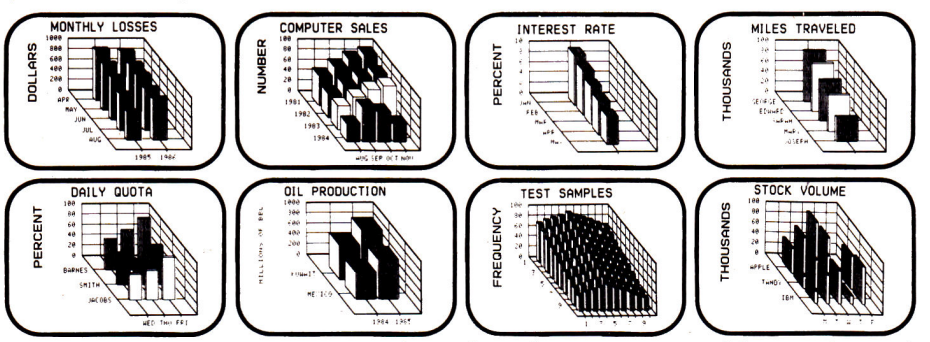

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LETTERS

dealer can give you a cable from a discarded power supply, you may not have to cut yours.) The blue wire is negative, red is positive, and green is ground. I left the green wire unconnected. You can plug the IIc into your battery-power source or the standard supply for AC operation.

The computer draws about 1.2 amps (2 amps with a disk drive running), about as much as a typical dome light inside a car. With my Apple flat-panel display, this system draws only 1.3 amps.

I've heard you can also convert the Monitor IIc by bypassing its internal power supply, but that monitor is difficult to modify. Other, less-compact monitors might be easier to convert. CRT monitors draw a bit more than 1 amp of DC current, and at least twice as much if you run them on AC power from a good inverter.

Wendy Dankoff
Windlight Workshop
P.O. Box 548
Santa Cruz, NM 87567

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

CORRECTIONS

On p. 44 of the January 1987 issue, we listed an incorrect phone number for Haba/Continental (under Product Information). The phone number should read (818) 994-1899.

In February's "Telecommunications: The Software Connection" (p. 53), pages 54 (beginning with "What Do You Need to Know?") and 56 were switched inadvertently. *inCider* apologizes for the confusion.

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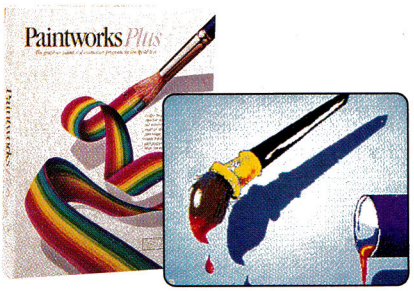

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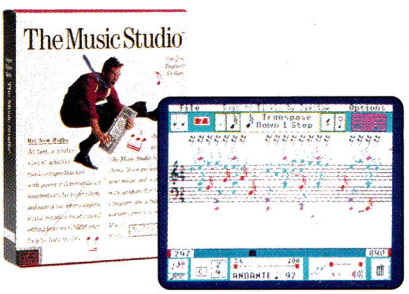

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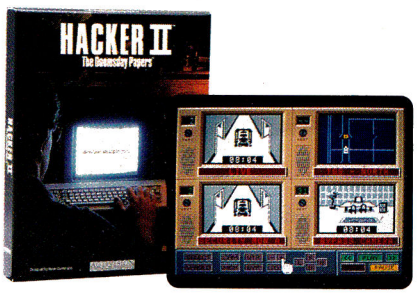

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NEWS LINE

by *inCider* staff

CRISIS IN EDUCATION

U.S. education is reaching a critical point, where "in the 1990s, the country will realize that it has a major education crisis on its hands," says Apple chairman, president, and CEO John Sculley.

This realization will be triggered by some major event: According to Sculley, the Russians will advance far beyond us in space, or teachers will leave the profession *en masse*. "Something will happen to let us know we've fallen behind and we have to place greater value on education," he predicts.

But out of this crisis, Sculley also expects a change for the better: New attention will be given to education, and the country will realize "educators have to be supported more than they have been."

Apple wants to help provide some solutions to the problem by emphasizing computers and software in the classroom for experimentation and simulation instead of rote learning. But the solution in the end "must come from within the education system itself," he says.

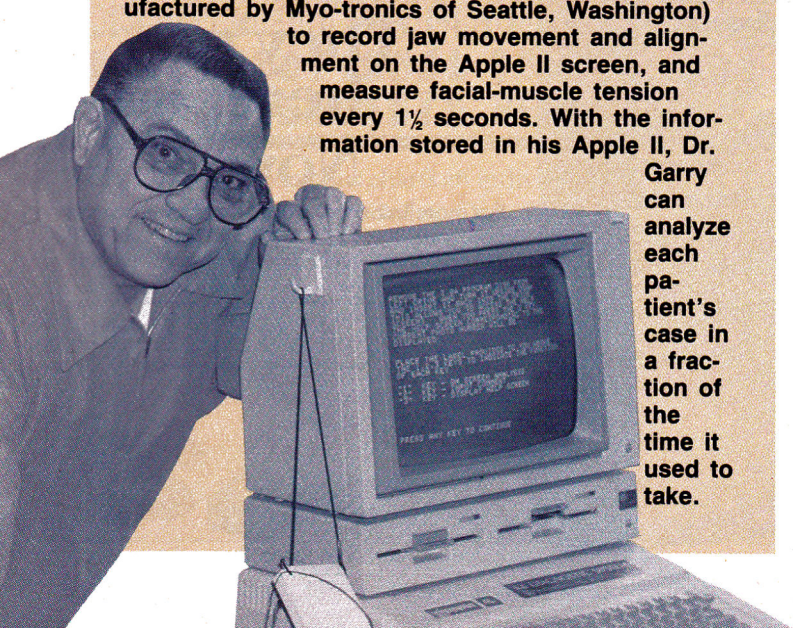
—D. de P.

"Without the scope, I wouldn't be doing nearly as many patients. [The Apple II] projects bite alignment as well as stores data. It eliminates the guesswork of where the jaw should be."

SPOTLIGHT ON . . .

JAWS

Patients coming into Dr. James Garry's office for treatment of a jaw-alignment problem called TMJ (temporomandibular-joint disfunction), which can cause headaches and earaches, will find themselves connected to an Apple II for diagnosis and treatment. Dr. Garry uses his Apple II with a Myo-monitor (manufactured by Myo-tronics of Seattle, Washington) to record jaw movement and alignment on the Apple II screen, and measure facial-muscle tension every 1½ seconds. With the information stored in his Apple II, Dr. Garry can analyze each patient's case in a fraction of the time it used to take.



FACE LIFT

Do you love the new platinum color of the IIGS, but want to keep your old faithful 8-bit?

Fear not. The latest Apple IIe ($829) sports a platinum case, adds an 18-key numeric keypad (with escape key for AppleWorks aficionados), and puts all its special keys, including Open-apple, Option/Solid-apple, and Reset in all the right places for a GS upgrade ($499). Where will the GS mouse go? Into the Apple Desktop Bus port in the back, of course. You might not recognize the new 80-column card—it's tiny and comes installed in the expansion slot. Now if Apple would just install the disk-drive controller at the factory. . . .

—P.S. and **D. de P.**

GS GAMES ON THE WAY

For Apple IIGS fans, the good news from January's Consumer Electronics Show was the promise of good game software. It's not a flood or even an armload of products yet, but the GS is taking its place as a colorful, great-sounding game machine.

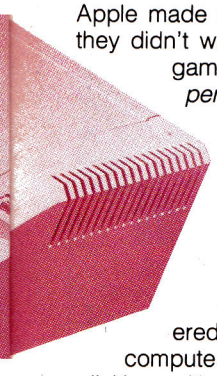
Activision president James Levy boasts "the first entertainment program" for the GS, Tass Times in Tonetown, with Shanghai, Hacker II, GBA Championship Basketball, and other games on deck.

At Electronic Arts, product-marketing manager R. Stanley Roach promises, "We're going to bring our premier entertainment titles onto the GS. We should probably have six or eight by Christmas, starting with The Bard's Tale in April." Epyx announced a GS version of Sub Battle Simulator, with World Games and Destroyer to follow.

MicroProse's Silent Service, the first game announced for the GS at the machine's introduction, is still planned, but marketing director Fred Schmidt confesses, "We're finding a lot of technical problems and bugs in play testing. We'll hold up the IIGS for a year if we have to [in order to fix every detail]."

In a way, the game publishers that are endorsing the IIGS are going against Apple's official view of the machine as an educational and productivity tool.

"The GS is not something that Apple is supporting entertainment-wise.



Apple made it pretty clear they didn't want it to be a game machine, *per se*," according to Intelli-Creations vice president Theodore Hofman. Roach agrees: "They don't want it to be considered as a game computer. They've explicitly positioned against that."

Nevertheless, Roach says, "While we don't see it as the driving thing to get people to buy a GS, after you've finished your work with your productivity software you might want to play a game," and the GS can be a great playmate.

—E.G.

A CONTEST FOR THE BIZARRE

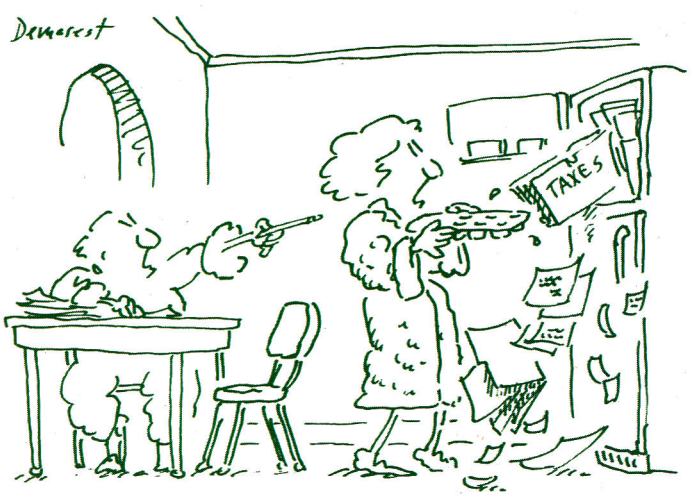
It's not often you can win an award for being disorganized, but there's a first for everything, and what better time for a bit of levity than tax time?

Broderbund Software Inc. is sponsoring a competition to find the craziest or most outlandish financial-management practice to promote its new personal-finance program, On Balance. For example, the guy who kept his tax records filed in *Newsweek* magazines on his coffee table thought he had a good system going, until his sister came to visit, cleaned his apartment, and threw them all away. An entire year's worth of statements, receipts, and a few unpaid bills all went to the dump.

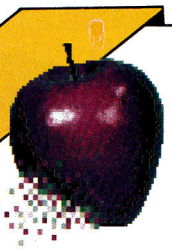
Maybe you have an even better story to tell. And if you do, what do you get if you win? You receive a copy of On Balance and a complete Broderbund software library, valued at $1000. Plus, if you're a member of a user group, your organization wins $500 in software, too. Second-place winners receive a software collection valued at $500, and semi-finalists receive a copy of On Balance.

So, all you crazy, creative, disorganized types, send your stories by April 10 to Broderbund Software Inc., 17 Paul Drive, San Rafael, CA 94903-2101.

—D. de P.



APPLE BITS



■Orange Micro sank **DOS Boot**, its MS-DOS emulator for the IIGS, in January. According to Arthur Scotten, president of Orange Micro, the product was "too expensive."

■AST's Ash Jain agrees that MS-DOS for the II won't make anybody rich. He hints that AST, manufacturer of Apple, Mac, and IBM peripherals, might build an **MS-DOS board** as a "strategic move." But we at *inCider* aren't holding our breath.

■Quadram looked at **Little Blue**, the MS-DOS board from Applied Engineering, and turned it down. But Apple, at least internationally, really likes it and is selling it abroad.

■A little-known fact: The design for Applied Engineering's **RamWorks** memory-expansion scheme was first developed by an Apple engineer. He showed his plans to managers at Apple, who said they weren't interested and he could sell it elsewhere. Dan Pote at Applied saw the product, and the rest is history.

■Look for a **universal disk-drive controller** this year or early 1988. It'll read and write ProDOS, DOS 3.3, MS-DOS, or Macintosh files, but it won't come from Apple. It may come from a company as close to Apple as Bell Labs is to AT&T, though.

■Pity Mike Brown. The poor guy keeps winning awards for his **Copy II+, CopyMac**, and other programs that make your life with a hard disk easier; but the ceremonies are held in front of a bunch of software developers who boo Mike as if he were a pirate.

■Apple is said to be building a **CD-ROM** drive controller.

■Apple mothballed a lot of **Apple IIs, IIIs, and Lisas** when it went on the Mac standard last year. We hear the company plans to sell them to schools at a "benevolent profit."

■Apple was pleased with Mac and IIGS **sales last Christmas**, but once again was "surprised" at how well the Apple IIe did. How can the company, after ten years, continue to be "surprised" at the strength of the IIe? We weren't.

■A new version of **The Print Shop**, which should offer hi-res graphics and high speed, is in the works. It's being developed by Brian Lee, president of Forte Research and Development (5221 Central Avenue, Richmond, CA 94804, 415-528-0227). Last we knew, Brian was looking for a "proven Apple II programmer familiar with the 6502 and hi-res graphics" to join David Balsam and Marty Kahn, two of the original Print Shop wizards, on the newest version.

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NEWS LINE

SPRINGBOARD'S HOT PROSPECT

This is just a first-glance, hands-off opinion, but we've found an early candidate for Red-Hot Software of 1987. It's Springboard Publisher, a page-layout and desktop-publishing program from the people who brought you The Newsroom. It runs on the 128K IIc and enhanced IIe, unlike the crop of desktop publishers due for the IIGS.

Springboard's program ($139.95; PostScript laser driver, $39.95) lets you divide pages between graphics areas and text columns. "Page mode" presents an overview of your work, with horizontal and vertical rulers; as you move, shrink, or expand a graphics area, text automatically rewraps to fit the new layout.

Double-click on part of the page, and Publisher shifts into text or graphics mode, with MacWrite- and MacPaint-style features, respectively. The program can import ProDOS or DOS 3.3 graphics, as well as supplied clip-art images.

Like Macintosh page programs, Springboard Publisher works in black-and-white only; like other 8-bit programs, it won't set the world on fire with its speed. Still, it looks like a terrific blow to those who thought the 65C02 was through. Watch for an official release in April, and a complete review in a future issue.

—E.G.

PASSPORT TO MAC

MacPassport, a new program for Apple developers (Apple Programmer's and Developer's Association, 290 S.W. 43rd Street, Renton, WA 98055, 206-251-6548), promises to open the doors to Apple II users who want to read ProDOS files on a Mac and maybe eventually an IBM.

This software tool lets Macintosh applications read ProDOS files from a UniDisk. With MacPassport and a bit of programming, developers can actually tailor an application to read or write files in application format. That means you could write an AppleWorks file with Microsoft Works on the Mac, or read AppleWorks files with Microsoft Works—after both Apple and Microsoft have modified their applications with Passport.

That's interesting, but what's even more intriguing is MacPassport's indication for the future: Apple ProDOS files on an IBM. We've already seen a prototype of a "data-transfer system" from CMS (3080 Airway Avenue, Costa Mesa, CA 92626, 714-549-4004) that does something similar with its own software. It lets a Mac share disks with an IBM and an Apple II, and read files from each of them.

The Envoy disk-drive controller (Asky, 770 Sycamore Drive, Milpitas, CA 95035, 408-943-1940) lets Apples read and write MS-DOS files.

It looks like somebody's already putting Apple II data onto Macs: ProLink ($39.95, ALSoft, P.O. Box 927, Spring, TX 77383, 713-353-4090) is a Mac utility that copies text files to and from 3½-inch Apple II drives. Now we just need Mac files on an Apple II.

—D. de P.

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

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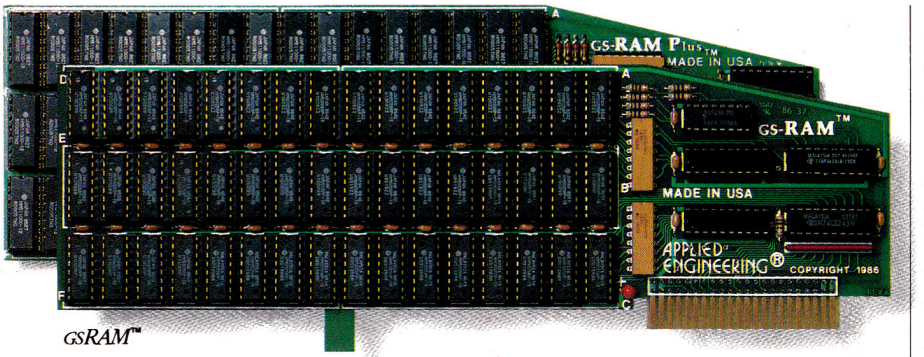

GSRAM™

Remember the 16K cards for the II+ and the 64K cards for the IIe? At the time, that much memory seemed like a lot. But when the owners of these memory cards came to us for more memory, many had to throw away their smaller Apple memory cards or try to sell them. Most of our customers told us that had they known about Applied Engineering's larger memory cards when they bought their Apple, they would have purchased them at the same time.

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Only GSRAM and GSRAM Plus eliminates AppleWorks internal memory limits, increasing the maximum number of records available from 6,000 to over 25,000 and only GSRAM and GSRAM Plus increases the number of lines permitted in the word processing mode from 6,000 to over 15,000. And only GSRAM and GSRAM Plus offers a built-in printer buffer so you can continue using AppleWorks while your printer is printing. GSRAM and GSRAM Plus even expand the number of lines in the clipboard from 255 to 2047 and will auto segment 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. GSRAM and GSRAM Plus will even display the time and date right on the AppleWorks screen. Nothing comes close to enhancing AppleWorks so much.

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Steve Wozniak, the creator of Apple Computer

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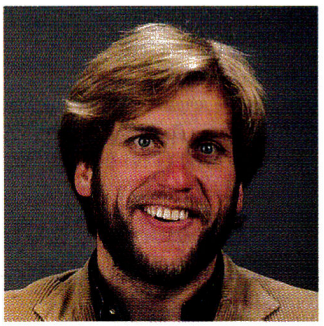
AppleWorks in a Hard Place

by Paul Statt, Technical Editor



"If AppleWorks is so powerful, why do you need third-party fixes just to make it work?"

AppleWorks is a problem.

I recently argued that the success of AppleWorks has more to do with its unique all-in-one applicability than its raw computing power (see "Economy," Stattus Report, December 1986, p. 156). Some of you disagreed.

"Mr. Statt must be living under a rock someplace," writes Gregory Keller of Colorado Springs, Colorado. "AppleWorks is a smashing success because it combines terrific power with an instinctively logical system of use."

Maybe it's too comfortable under my rock.

I concede the second point—AppleWorks' logical system of use. It's one of the best. But powerful?

Defenders of the AppleWorks faith would have been hysterical in the days when Ptolemy was propping up his position that the earth was the center of the universe: "Anybody can see the sun move—that's what Ptolemy says. Venus and Mercury move backwards, you say? Don't trouble me with details." Copernicus cut through that mess of epicyles with a straight line that started at the sun.

"Anybody can see the power of AppleWorks," the program's enthusiasts claim. But I see some troubling details.

Today's AppleWorks is a mess—of fixes, gerryrigging, and complications. If AppleWorks is so powerful, why do you need MacroWorks, AutoWorks, SpellWorks, MoneyWorks, GraphWorks, CommWorks, ThinkWorks, and FontWorks just to make it, well, *work*? Not to mention Transwarp, RamWorks, and Desktop Expander software.

Graphs shouldn't be an option in a spreadsheet, nor simple telecommunications in a word processor. They're necessities. In Chevrolet's original Chevette, the back seat was optional, but it didn't take too long to become standard.

No matter how underpowered it is, though, AppleWorks still has a great interface. The interface represents to you what the computer is up to, and gets your ideas across to the machine. I used to think telecommunications was what happened to bad people when they died, until I discovered Gary Little's program Point to Point (from Pinpoint Software). Point to Point performs the telecommunications job (rather basic, really) with ease. It uses the AppleWorks interface.

Check-writing software used to make me laugh harder than electronic cookbooks did. Quicken (from Intuit) and its AppleWorks interface made me sit down and take notice.

I wish Apple Computer had encouraged file-card menus in half as many programs as it did icons and pull-down menus. Most computers work with text, not pictures, and the AppleWorks interface is a more intuitive way to write, calculate, or file than the Macintosh interface is. I wish all spreadsheet/database/word-processor combinations let me keep 12 documents on my computer "desktop" at once.

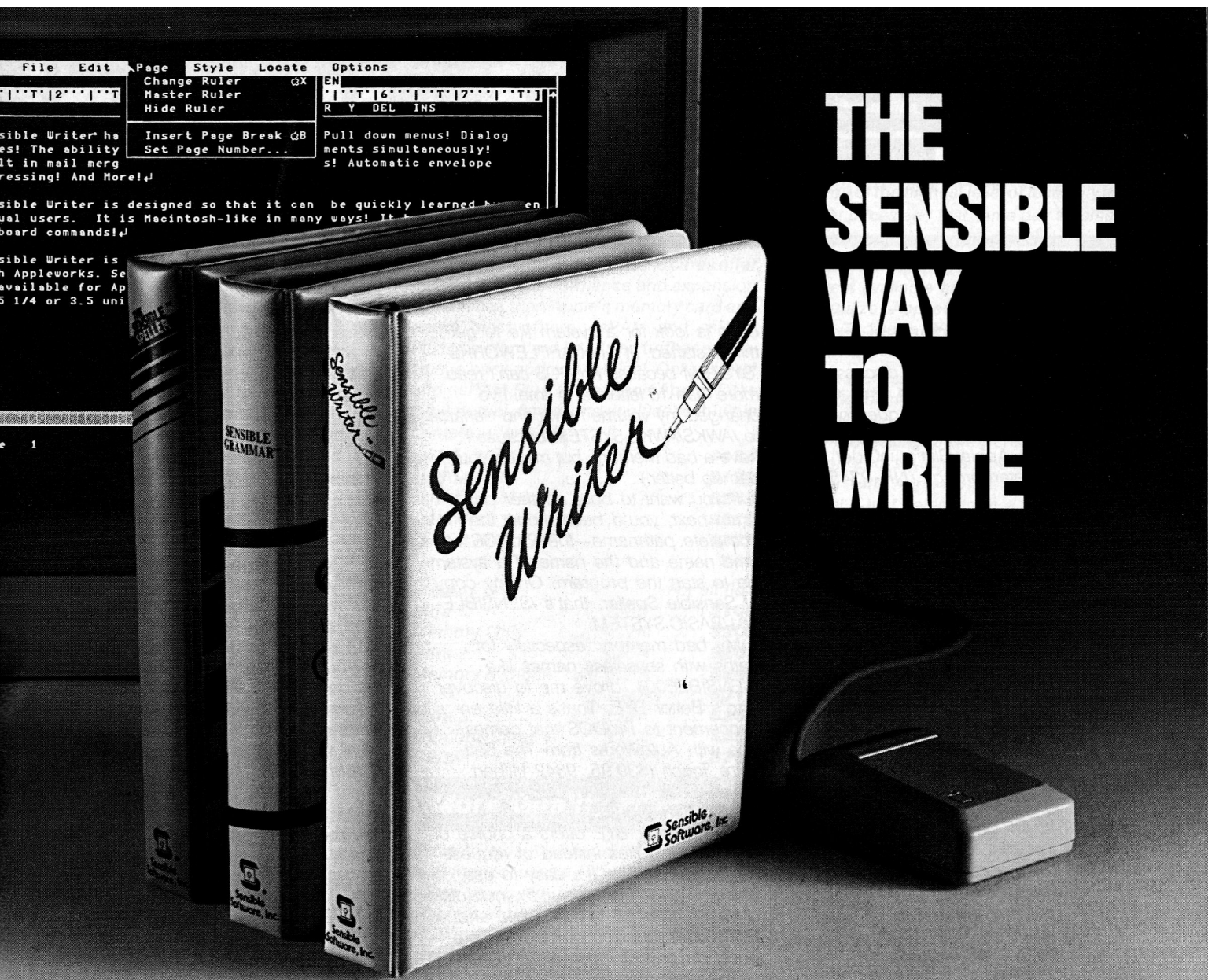
Regardless of its easy interface, though, AppleWorks shouldn't be described as integrated. AppleWorks' brand of "integration" is forced. For instance, it might be nice to copy numbers from the spreadsheet or database into the word processor without making a sacrifice to the disk gods. If AppleWorks were integrated, you should be able to integrate ProDOS Apple Writer and SuperCalc3a by loading them into a big RAM disk together.

Apple isn't serious about software. More people—I understand about 500,000—use AppleWorks than any other single piece of software. But Apple claims it's not in the software business, and leaves it to third parties—Pinpoint, PBI, The Software Touch, Beagle Bros, Applied Engineering, and the rest—to bring AppleWorks up to speed. Apple souped up AppleWorks 2.0 by adding mail merge—and left macros, color, graphs, a mouse, and telecommunications to others.

Those third parties have fixed AppleWorks, building a Porsche from a broken-down VW Bug and a handful of parts. But if AppleWorks were a powerhouse, you wouldn't be driving to the poorhouse while your disk drives hum with options.

Third-party companies are solving the problem of AppleWorks the way Ptolemy kept the earth at the center of the universe—with more trouble than it's worth. They ignore the simple fact that AppleWork itself needs work, because it looks like the software universe revolves around it.

A problem, though, is a rock with an oppportunity hiding under it like a gold coin: Maybe some bright programmer will forget the nickels and dimes and go for the gold. Build a better AppleWorks—true integration *and* the AppleWorks interface—and watch who beats a path to your door. ■



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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.*

No Way to Say Bye

When I exit from AppleWorks, a message appears on screen: ENTER PATHNAME OF NEXT APPLICATION. Can you re-enter AppleWorks without rebooting the Startup disk? Can you load and use Sensible Speller without booting it?

Susan Weinstein
Brighton, MA

The message is actually two-part: first, ENTER PREFIX (PRESS "RETURN" TO ACCEPT), then ENTER PATHNAME OF NEXT APPLICATION.

You've just met the ProDOS BYE command. It's a sometimes useful, often infuriating introduction to the ProDOS Machine Language Interface for many AppleWorks users. Its purpose is, just as you suggest, to get your next application up and running without rebooting. The tough part is that you have to remember ProDOS pathnames.

If you want AppleWorks back again, remember to put the AppleWorks Startup disk in your boot drive; to quit AppleWorks, you had to have the Program disk in place.

Setting the ProDOS prefix is your first move, and it's an easy one. If you've just quit AppleWorks, the default prefix is /APPLEWORKS, and that's the one you want. Simply hit Return. Now you need to recall the entire pathname of the next application. If you haven't changed any of the names of files on your AppleWorks disks, the pathname is /APPLEWORKS/APLWORKS.SYSTEM.

/APPLEWORKS is the name of the disk—the volume name in ProDOS. /APLWORKS.SYSTEM is the name of the ProDOS system file. When you use a ProDOS-based application, the first thing that goes into your computer is a ProDOS loader program. The first thing the ProDOS loader does is look for a system file to get things started. (It's not APPLEWORKS .SYSTEM because ProDOS can't read more than 15 letters at a time. I've changed my volume name and filename to /AWKS/AWKS.SYSTEM because I have a bad memory, but maybe you can do better.)

If you want to boot another program next, you'd better know the complete pathname—the ProDOS volume name and the name of a system file to start the program. On my copy of Sensible Speller, that's /SENSIBLE-001/BASIC.SYSTEM.

My bad memory, especially for paths with senseless names like /SENSIBLE001, drove me to discover Bird's Better BYE. That's a little enhancement to ProDOS that comes free with AutoWorks from The Software Touch ($39.95, 9842 Hilbert Street, Suite 192, San Diego, CA 92131, 619-549-3091.)

Bird's Better BYE offers a choice of volumes and files instead of requesting cryptic codes. It's easy to use, and you can check your 5¼-inch disk drives, UniDisk 3.5, hard disk, and RAM disk, too. You can boot a program on any of those disks without taxing your memory.

You can install Bird's Better BYE simply by copying ProDOS from AutoWorks to your ProDOS application disks. Eric Grevstad, inCider's *review editor, had a great idea and installed Bird's Better BYE as his HELLO program on his 800K 3½-inch drive.*

You may be asking, "Why bother?" The advantage of moving from one application program to the next without rebooting—that is, without using Control-Open apple-Reset (warm boot), turning the machine off and on again (cold boot), or typing PR#6—is that you prevent the destruction of all the files in your RAM disk(s) that rebooting causes.

Template Mysteries

I'm the happy owner of an Apple IIc. I use it to manage the inventory of my furniture business with AppleWorks. Can you help me make templates? I write many business letters—how can I save them for future use or modification? I've tried to save spreadsheets, only to find that if I erase all the figures I lose all the formulas as well.

Peter Davis
Malvern, PA

Templates cause more confusion among AppleWorks beginners than RAM disks or printer codes. A template is simply a pattern or mold; in the software sense, a template is a form you fill in with figures or words.

A word-processing template is the simplest: If you want to compose a form-letter template, just type the letter as you would normally, but instead of the date, type DATE, and instead of the name of the person you want to write, type NAME. Save this document with a simple name such as FORMLETTER:

DATE
Peterborough, NH 03458
Dear NAME:
We can't answer every letter in *inCider*; instead, NAME, I'm sending you this personal reply....

And so on. When you want to send a form letter, bring up the file FORMLETTER and immediately change the name of the file (using Open apple-N) to, say, JOHN SMITH. Then find and replace all the DATEs with the current date—say, April 15, 1987—and all the NAMEs with John Smith. Press Open apple-R (replace), and choose "case-sensitive text" to avoid mangling words like enamel.

Spreadsheet templates are a bit harder to create, but the idea is the same: Rename your file (with Open apple-N) every time you want to use the template again.

For instance, I created a spreadsheet template to figure my travel expenses. It's called TRAVEL. When I first made up all the formulas, before I even plugged in some numbers to see if it worked, I saved it as TRAVEL. Then I changed the name to TRAVELTEST, and tried some numbers. It didn't work right; I made changes on both TRAVEL and TRAVELTEST until the spreadsheet clicked.

I threw TRAVELTEST away and saved TRAVEL. Once a month I load TRAVEL and rename it TRAVEL.MAR,

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TRAVEL.APR, and so on, plug in my figures, and print a copy. You might want to keep your inventory files on a disk (ProDOS calls it a volume) called INVENTORY.

You might find it easier to buy templates. For instance, inCider *markets its Success with AppleWorks disk in the* hotCider *series, with a sampling of templates from Ruth Witkins' popular AppleWorks in Action column, or you could check our Marketplace and Classified advertising sections (pp. 116 and 119, respectively) to see what's available. Wherever you get your templates, though, remember you have to type Open apple-N to use them.*

Keep It Secret

I've been working on a long program and want to write-protect my disks. Is there any way to disable the CATALOG command?

Danny Niebrugge
Decatur, IL

To write-protect your disks—that is, to make it impossible for anyone to write on them—you have to cover the square notch on the right side of each disk (the "write-protect" notch) with a small piece of tape. Pretty simple to do, pretty simple to undo—all the next guy has to do is remove the tape. You could attach it with a dab of super glue, but you may not really be worried about the next guy writing over your program—you may be afraid he's going to steal it.

Copy protection is a little harder to achieve. Your idea of slowing pirates by disabling the CATALOG command—if he doesn't know the name of the file, he can't copy it—is an interesting one, but not very practical. The best you could do would be to make it difficult for a thief to catalog your disks after running one of your programs.

The CATALOG routine, in either DOS 3.3 or ProDOS, is a program in the computer's monitor. *That's not your screen display, it's more like a "hall monitor" who watches over some of your Apple's basic tasks.*

By writing in machine or assembly language you can change some of the monitor routines in your computer. From BASIC you can write POKEs into the monitor. For instance, in DOS 3.3, POKE 44452,1 and POKE 44506,0 will make your Apple's CATALOG command pause before it prints anything.

If your program is self-booting, you can simply add a line like 10 POKE 214,255 to your HELLO program. This sets the RUN flag so that any *command given while your program is running will only make your program run again. Or you could type in Orlando Fernando's little password program ("HELLO Password," Hints/Techniques, p. 110). Either method would slow down the pirate, but not stop him from booting DOS 3.3 from another disk and cataloging yours. Sorry.*

ProDOS Problems

ProDOS is in dire need of a startup program that will emulate a DOS prompt—rather like the MS-DOS prompt.

Such a program would be invaluable to ProDOS programmers if they could write text files from it, format ProDOS disks without loading the User's Disk, and tell at a glance the directory in which they were currently located.

It shouldn't be difficult to write. Countless subscribers will thank you, and it's a tool you could use yourself.

Jeff Freeman
(address withheld)

Amen, Jeff. Praise ProDOS and pass KIX: KIX is a ProDOS front end that offers everything you ask for and a lot more. It's from Kyan Software (1850 Union Street #183, San Francisco, CA 94123, $49.95), makers of Kyan Pascal, but it looks more like UNIX. Bob Ryan reviewed it in inCider *in January 1987 (p. 118) and decided that "serious users shouldn't be without it." It's invaluable for hard-disk users, if you ask me, and, come to think of it, could be a great help to programmers, too.*

PFS:Write/AppleWorks

I have quite a number of PFS:Write word-processing files I now need to use in AppleWorks. Our local Apple dealer says new versions of PFS:Write still don't allow interchange of files. I don't have a modem. I hope someone can help—otherwise I have hours of retyping ahead.

John Monson
Green River, WY

We can help.

The new—that is, ProDOS—version of PFS:Write does create files that AppleWorks can get from disk. There's a lot of garbage at the beginning—the codes that make PFS:Write what it is—but the text is there, and all you have to do is delete the codes.

If you have the older Pascal PFS:Write, you'll have to convert the Pascal files to ProDOS—try Gary Charpentier's Universal File Conversion program from Quality Software (21601 Marilla Street, Chatsworth, CA 91311).

Graphics Facts

I've owned my Apple IIc for six months and have been trying unsuccessfully to access double-hi-res graphics. I realize it's difficult and involves a few PEEKs and POKEs, but all I need are a few scatter plots and function graphs.

Robert Cobb
Reidsville, NC

In the December 1986 Apple Clinic you stated that "the only practical way to program double-hi-res graphics is through assembly language." I have to disagree. ZBASIC is faster and much easier.

Double-hi-res is as simple as setting Mode 7 (the ZBASIC equivalent), setting the color (limited to black or white now, but I'm working on color), and plotting the points. ZBASIC includes several built-in hi-res routines.

I'm the Apple programmer at Zedcor, makers of ZBASIC ($89.95). I'm not asking for an endorsement—I'm simply trying to make your readers aware of another way to program double-hi-res graphics.

Greg Branche
Tucson, AZ

Thanks for the tip. Check Jim McKelvey's review of ZBASIC in the February 1986 inCider *(p. 58), and look for Bob Ryan's comparison of Apple BASICs in an upcoming issue. If all you need is black-and-white, ZBASIC does the job. (Zedcor is located at 4500 East Speedway Boulevard, Suite 22, Tucson, AZ 85712.)*■

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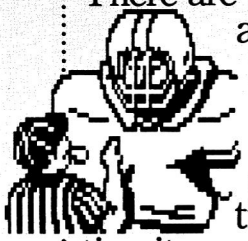

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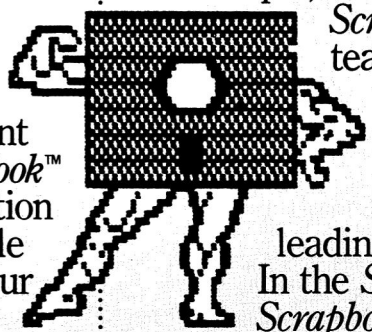

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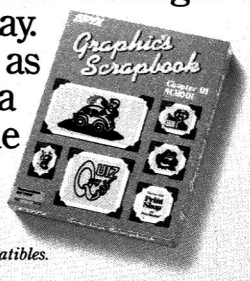

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No Cause for Complaint

by Eric Grevstad, Review Editor

"Obsolescence is the rule, not the exception, in every consumer industry and especially in computing."

It's not that, having often criticized Apple on this page, I have a whim to turn like a mad dog and attack some readers. But there's a current topic on which I find myself siding with Cupertino—and, judging from debate on the *inCider* BBS, against some pretty steamed IIc owners. To put it bluntly: Why the heck are IIc people complaining that Apple isn't offering them a GS upgrade like the IIe's?

Make no mistake, some IIc owners feel strongly about the subject—one writing that he feels "betrayed" by IIe users' good fortune, another retorting, "You knew the IIc was unexpandable when you bought it," a third angrily saying, "Stuff it in your ear [hey, fella, we run a clean BBS, and besides, the IIc isn't that portable]. You [Apple] owe it to us IIc'ers to give us an upgrade."

Who says? It's okay for buyers to feel that they loyally supported the II during a time when, in one on-line opinion, "Apple tried to ignore the II, but take the dough from the IIc and put it into commercials for the Mac." Another BBS user wrote that he bought a IIc when it was promoted as "the top-of-the-line Apple"; others questioned that, but it's arguable that for a time Apple tried to force the IIc down America's throat (giving the IIe, if I remember correctly, the market's only microcomputer price increase).

That was 1984, the year of the IIc and the 128K Macintosh, the crest of Slotless Steve Jobs' "let me tell you what you want" approach to closed-box marketing. Those days are gone, happily, but the debate over neglect or support is a separate issue anyway. We're discussing what the IIc is, what it was always clearly defined to be, excepting the efforts of ingenious memory-card makers (and now the latecomer among them, Apple). It's an entry-level, airtight appliance. It's got definite computing power, it's got a decorative carrying handle, but it just ain't got no slots.

We needn't argue about the merits of the design, or of convenience versus expandability. I've never been much of a IIc groupie myself—I think it's overpriced for its power and degree of (let's be polite) portability, and its keyboard acts like Tanya Roberts (stiff and shallow). I prefer computers with slots, "Room To Let" signs, and nooks and crannies, and others seem to share my preference. Everyone expects an open Mac by the time you read this; Tandy's new IIc-style, not very expandable 1000EX is a slow seller beside the more costly, slotted 1000SX.

But a GS upgrade? Oh, there's no doubt Apple could do it, drop the GS' slots (except maybe for memory), keep the ports, make space for the new stuff by replacing today's IIc insides with a Mega II chip. A compact GSc would be a sweet machine. For all I know, there may already be one in some triple-locked Apple laboratory.

But is Apple *obligated* to make one, or to make you a deal on it? Not really. This isn't the MS-DOS market, where the architecture is almost common knowledge and you can buy PC-compatible portables in 15 flavors, each of which must (sigh) compete on price.

And, ultimately, the abandoned-buyers' gripe is one we computer users have less right to than we think. To use an analogy first made by Garland Buckingham of Roger Wagner Publishing, I own a 1984 Honda, but my dealer would laugh me out of the showroom if I declared myself entitled to a free upgrade to an '87 model.

Look at almost all my noncomputer purchases: If the developer of my apartment complex builds a luxury condominium, do I get a chance to trade up? My TV, my stereo, my toaster oven have all been discontinued in favor of newer models. Has any of them been offered to me at a discount? Compared to those of other fields, some hardware and software firms' policies have spoiled us, and Apple has spoiled us more than many. Were any PC or XT owners offered an upgrade or swap when the AT appeared?

Obsolescence is the rule, not the exception, in every consumer industry and especially in computing, where everything on sale is at least theoretically obsolete compared to tomorrow's gee-whiz developments. Apple has bucked that trend pretty well; with handouts like the 3½-inch-disk-ROM and logic-board (for the new memory card) upgrades, you might say it's given IIc owners a free lunch. Anyone demanding a GS kit is expecting a free seven-course dinner with champagne and cake. ■

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REVIEWS

Omnis 3; Animate; Muppetville, Muppet Word Book; Softdisk, UpTime for the Apple II; Slotbuster II; Lords of Conquest; The Rocky Horror Show; Goldfinger; Hardball!

Industrial-Strength Database

OMNIS 3

Blyth Software Inc., 2929 Campus Drive, Suite 425, San Mateo, CA 94403

Relational database manager; 128K Apple IIe, three floppy drives or hard disk
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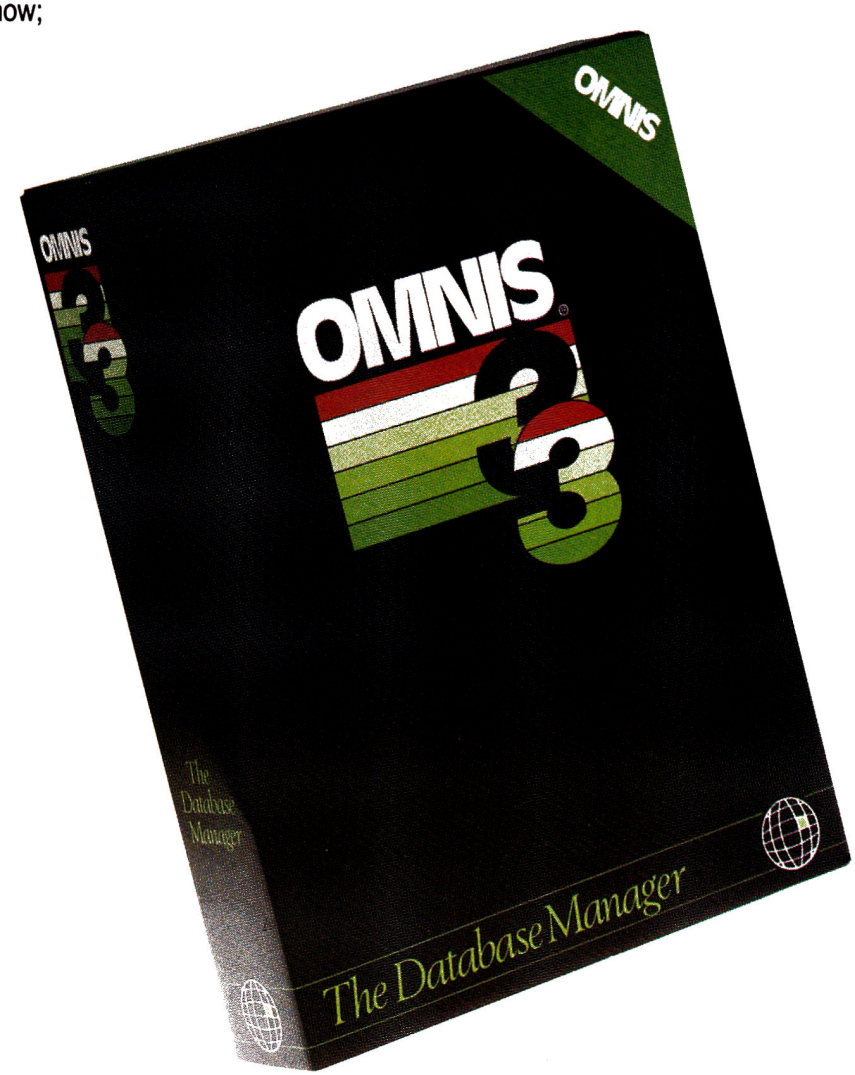
Rating: ■■■■



There's a lot to be said for the shoebox method of database management. To record expenses and orders for your client, you just took the Village Pub lunch receipt, matched its date with your appointment calendar's "lunch with Smitty" entry, copied Smith's title, company, and address from an old letter, and found his order written on the Village Pub napkin. It was easy to put these few facts together, if you could just find them.

Eventually, however, the shoebox starts overflowing with receipts, napkins, invoices, matchbooks, and old envelopes. You might expect your trusty Apple II to organize all that random information with a database program. But then you discover that simple file managers, while making it easy to find facts, can't put them together—can't, say, connect the file of expenses with the files of orders and clients.

Before you go back to the shoebox, consider Omnis 3—one of the more popular Macintosh databases, now available in a harder-to-use Apple II version. Like dBase III and other data heavyweights, Omnis 3 is a relational database-management system that can connect different data files having items in common. It's also an application generator that can construct programs for an enormous number of purposes, such as inventory control, invoices, time and billing statements, ledgers, and other complex records. Designed especially for business, Omnis 3 is unique in offering a multi-user version for Apple IIs connected by a Corvus network.

If you've been using a simpler database, like AppleWorks', you may find Omnis 3 a bit overwhelming. AppleWorks manages one file at a time, with 30 fields per record and 76 characters per field. Omnis 3 handles 12 files at a time, 120 fields per record, 79 characters per field. In practice, the number of Omnis 3 records is limited only by available disk space. Using a IIe with 128K and a 10-megabyte hard disk, Omnis 3 can manage a mailing list or other file totaling 25,000 average-sized records, compared to 750 similar records for AppleWorks.

More important, of course, is Omnis 3's ability to manipulate all that information. The program's powerful features could fill a book—a 330-page manual, in fact—so let's just look at the highlights of structuring an application, entering and retrieving data, assembling reports, and designing menus.

SOME KIND OF RECORD

The Omnis 3 menus help you determine the ways in which your data will be stored. You create file formats to define the attributes (name, length, and data type) of each field in a file. You can also index fields on which you'll want to sort and identify connections among files. Fortunately, it's not too difficult to change your mind later.

inCider's Ratings

Excellent—remarkable, a must buy	■■■■■
Very good—impressive and recommended	■■■■
Good—average, solid performance	■■■
Fair—flawed but adequate	■■
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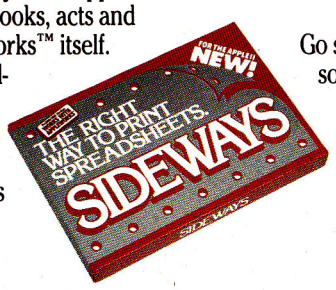

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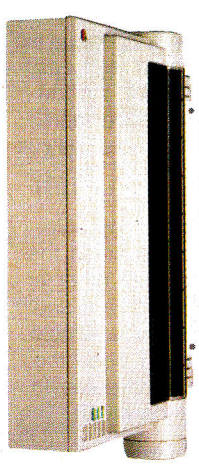

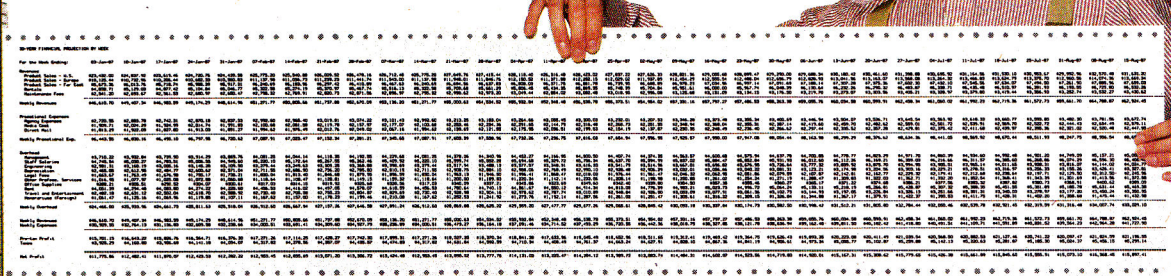

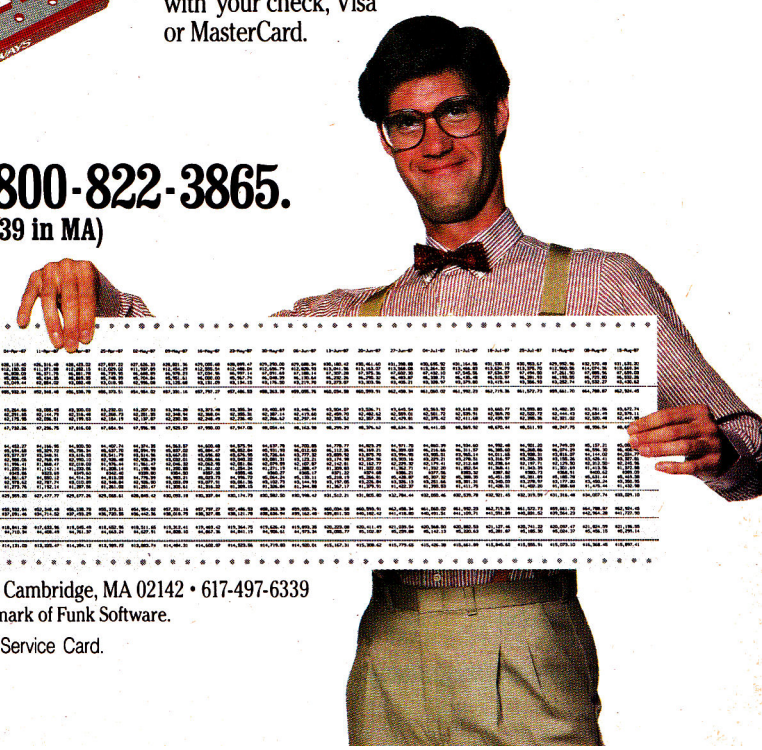

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Next, you can format entry screens, describing formulas to manipulate entered data and establish the effect of one file's entries on another file. For example, you could decide that a field like "Customer Name" must always be filled in before that record is saved, make it impossible to enter the same code number for two different clients, or have Omnis 3 find clients' names automatically when you enter their code numbers. Entered data can also be manipulated with 12 mathematical and logical operators (from plus and minus to AND/OR), 13 functions (including ABS, INT, LEN, position within strings, and concatenation of strings), and formulas.

These examples give only a hint of Omnis' flexible control over data entry. Each entry format can be 12 screens long, and you can set up messages and command sequences for each screen, even overlaying one screen on top of another. More than 20 entry command sequences permit, restrict, or automate activities such as editing, searching, deleting, inserting, or printing.

SEARCHING AND REPORTING

Omnis' information-retrieval functions are similarly sophisticated. You can create and save as many as 60 different search formats, each comparing as many as 50 items within a database. (AppleWorks, by contrast, saves eight formats, each comparing a maximum of three items.) Unlike AppleWorks, Omnis 3 can't display the results of a search on screen in tabular format, like a telephone bill, but only a record at a time. You can base Omnis 3 reports on the different search formats you've set up.

Omnis 3's report capacity is voluminous. Each report layout can include a whopping 9600 fields, with each record printed in 240 columns by 240 rows. Each report can include 60 totaled and 60 calculated fields. Reports can be sorted up to a depth of nine levels—personnel records by gender, gender groups by age, age groups by height, and on and on.

Flexible in formatting printed reports, Omnis 3 can produce labels, invoices, letters, payroll, ledgers, and other forms, with page and section headers. It can print labels nine across, eliminate empty lines when printing addresses, and even close up space in a letter when an inserted field is short.

For the business user, the greatest virtue of Omnis 3 may be its ability to revise screen menus to guide novices in entering data and printing reports. Combined with entry command sequences and moderate password protection, the menu-creation feature lets you build turnkey applications, steering a user through the process of entering or retrieving information for specific needs.

NOT FOR EVERYBODY

Would you guess that a program so complete and sophisticated isn't easy to learn or use? You're right. As the Omnis 3 manual admits, "The more flexible an operation, the more difficult it is to explain in a clear and concise manner."

Omnis 3 certainly tries to be helpful. Although I managed to crash the program once, it handled all other errors effortlessly. It's menu-driven and frequently displays a line of available commands, although you'll need the manual or pocket reference guide to know what the commands mean. The

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manual also includes a tutorial that effectively introduces the most important commands and features, leading you through the creation of a time and billing application with three connected files for clients, rates, and time.

Happily, Omnis 3 also includes a number of very helpful utilities to manage its files and formats and to add data from Pascal text files in DIF format. Because the program is written in UCSD Pascal and runs under the p-system operating system, you must convert its files before other operating systems can use them. Omnis 3 utilities can convert Pascal files to DOS 3.3 and vice versa, but you'll need another utility to convert your ProDOS files to DOS 3.3 first.

In addition to these complexities, there are significant problems with the manual, installation, and support. You'll adjust to the documentation's British-style English ("full stop" for "period"), but unless you know something about database construction or programming, you'll wish for more detailed examples and clearer emphases in the text.

Omnis 3 comes on three disks and requires either three floppy-disk drives or one floppy and one hard disk. (A new GS version, supporting 800K drives, is anticipated.) If you don't speak Pascal, you'll find hard-disk installation somewhat trying—in part because the manual's instructions are wrong about the space and files required. Although you can copy the program files to a hard disk or Pascal-compatible RAM disk, Omnis 3 will randomly require that you insert the original system disk three times in 100 uses.

Perhaps because the Apple II version is relatively new, it seems that too few members of the support staff at Blyth Software can answer questions about it. Several calls were required before I reached one very knowledgeable expert who carefully and cordially solved my installation problems. If you're installing Omnis 3 for a 128K IIe with a hard disk, you'll be happier if you call for clarification before you begin. If you want support after the warranty has expired, Blyth offers three extended programs, priced from $60 to $95 per year.

Nevertheless, even if your applications don't take advantage of all Omnis 3 features (and I can't imagine one that does), you may still share my conclusion that the program's power repays the required investment of time and money. If you're frequently frustrated by costly commercial programs that don't quite suit your particular needs, climbing Omnis 3's learning curve will prepare you to construct applications perfectly tailored to you or your clients, saving money and headaches in the long run.■

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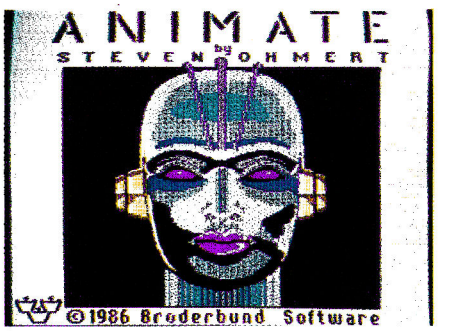

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Rating: ■■■■

Are you weary of reviews touting business-minded, left-brain software designed to save you time and money? If so, you're in for a pleasant right-brain tingle. Broderbund's Animate is unabashed fun, a program almost entirely without business merit—unless, perhaps, you want to work for Walt Disney Productions or Hanna-Barbera.

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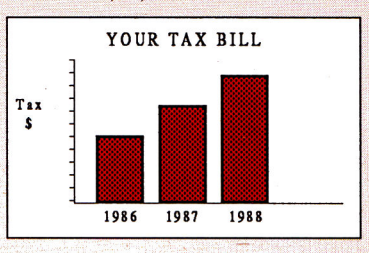

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No prior experience is required, though familiarity with Broderbund's Dazzle Draw will push you to the head of the class—Animate's Macintosh-like interface and pull-down menus are child's play. For practice, new animators can use the background and character images stored on the library disk that comes with the program. A demonstration disk, also supplied, warms you to the art of animation by showing some of the possibilities. A cartoon? A movie? An animated greeting card?

FRAME BY FRAME

Once you get past the stage of playing with the demos, you'll discover Animate is a considerably more powerful package than Broderbund's earlier animation workshop, Fantavision. In Fantavision, you need draw as few as two frames indicating the beginning and end of a sequence; the program fills the frames in between via a process called tweening. This lets Fantavision do most of the work while you dream up all sorts of graphic metamorphoses, turning a bird into a fish, a barracuda into your algebra teacher, or vice versa. It's like stream of consciousness for artists.

Unlike Fantavision, Animate uses the more painstaking classic approach to perceived motion followed by cartoonists and film makers. The process is called cell animation. Draw a character—a ballplayer at bat, for example. Frame the picture. Copy it to as many other frames on screen as you want. Then, beginning with the second frame, slightly modify the character's stance—make him shift his weight, pull the bat back, swing it forward, hit the ball, and follow through.

What about the ballpark? No problem. You can draw the background for your movie with Animate or you can import one created with Dazzle Draw or another single- or double-hi-res package. Either way, you have a palette of 16 colors and various paintbrush sizes with which to work. Just as you drew the ballplayer, you can polish any background with amazing detail by zooming in and modifying drawings pixel by pixel. You can even add text or printed dialogue to your scenes.

Oh, you want to get fancy? Animate lets you design paths for a mere 16 characters in a given scene, so you won't be able to move all the players on both teams at once. Instead, like a television camera, you can pan from right field to center, to left, to home plate, and order these vignettes on self-booting show disks.

SOUND AND STILLS

Adding your own rendition of *Take Me Out to the Ball Game* is a mere technicality. Ever play piano with a mouse? Animate has a graphics electronic keyboard. You can add music to your movies by transcribing sheet music, playing by ear, or composing original pieces. You can syncopate and synchronize to beat the band.

Unhappily, the IIc and IIe would never get past the tryouts for the orchestra, so don't expect too much from the music that Animate wheedles out of the computer. Three waveforms offered include the familiar reedy sound and a laser-zap sound.

If you have a printer, you can print frames or stills in black-and-white, or in color if you own an Apple ImageWriter II, Scribe, or Epson JX-80. For animated 3-D fun, the fairly well-written documentation shows you how to make flip books, rotoscopes, zoetropes, and other toys.

Broderbund hasn't forgotten the needs of programmers. Utilities for BASIC and assembly languages help you incorporate Animate scenes into your programs. What a great way to teach science! Look at those chromosomes do the jitterbug! See heat transfer via conduction, convection, and radiation! Watch those electrons spin!

I tested a first-run version of Animate, a plausible reason for the minor problems I experienced—having created a series of frames and set them to music, for example, I couldn't go back and erase text in an early frame. It took practice and patience to get the trick of selecting and copying characters within a frame. Aside from these annoyances, the program performed well.

But making computer movies is a bit costly. The $69.95 price tag doesn't bother me as much as the $15 extra you must pay for a backup

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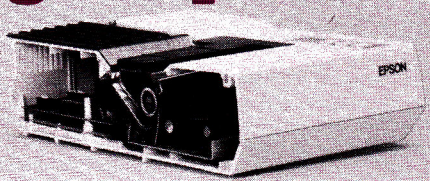

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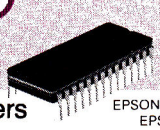
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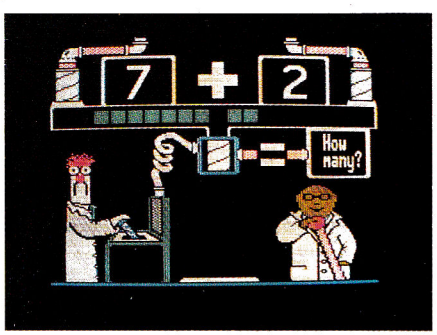
disk. Broderbund seems to have regressed; its customary policy of providing a once-only backup utility is fairer to the consumer.

Animate won't turn your Apple IIc or IIe into a IIGS, but it might transport you to a world far removed from mundane left-brain responsibilities like database management and spreadsheet analysis. It's worth a look for business or educational demonstrations, but mostly it's more fun than Cecil B. De Mille. ■

Cynthia E. Field
Wakefield, RI



Muppet Basics

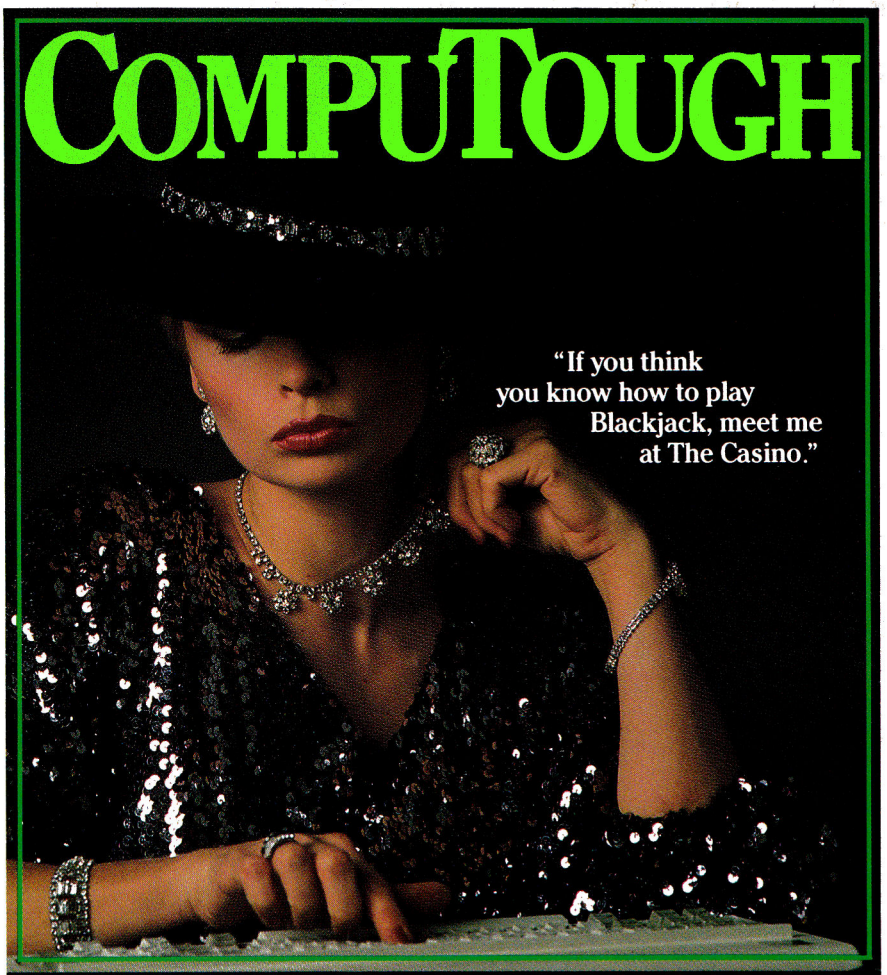
MUPPETVILLE

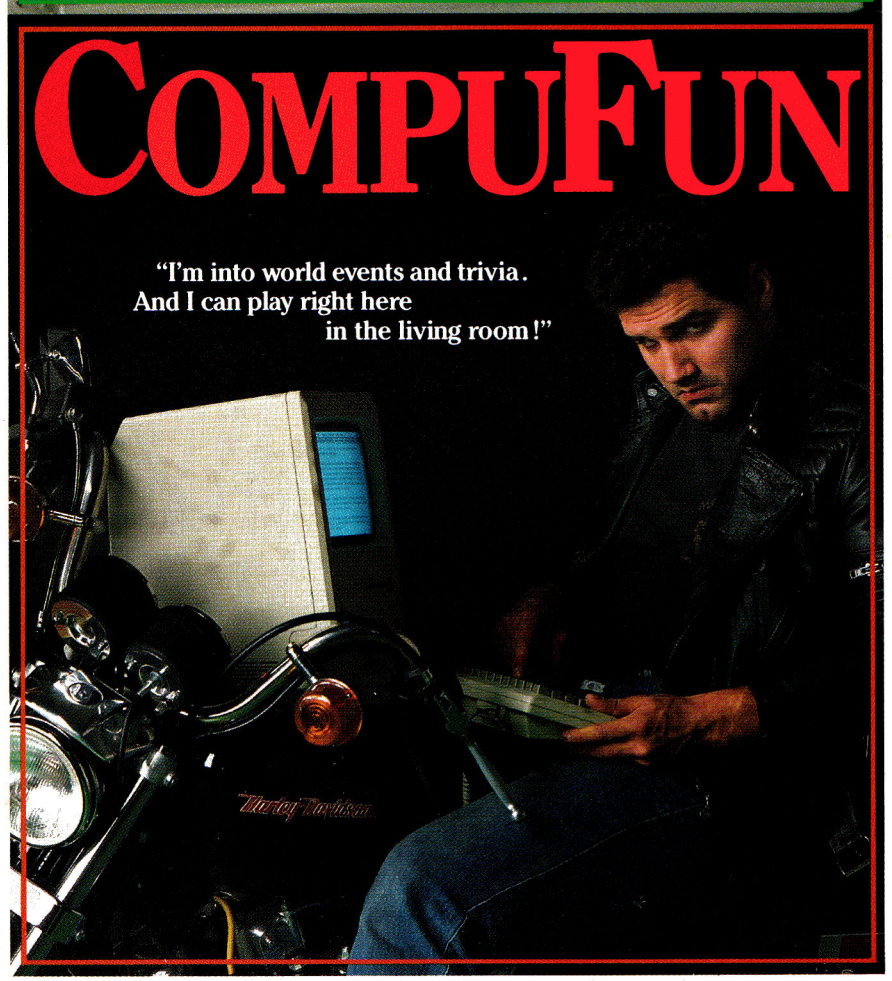
MUPPET WORD BOOK

Sunburst Communications Inc.,
39 Washington Avenue, Pleasantville, NY 10570
Early-educational software; 64K Apple II Plus or later, Muppet Learning Keys optional
$59 each
Rating: ■■■■

They've made millions from movies, TV, and toys, but Jim Henson's Muppets aren't too proud to help a kindergarten teacher. Sunburst's two new programs use *The Muppet Show* characters to teach letter, number, and shape discrimination, matching, simple addition, and the formation of simple words to preschoolers through first-graders.

Besides the fun of learning with Kermit, Miss Piggy, Gonzo, and the rest, the programs feature excellent graphics and sound. Each contains six games or activities, easily accessed from a central menu—a signpost in Muppetville, a table of contents in Muppet Word Book. It's also easy for children to get help or erase an activity to start again. Incorrect responses are gently blanked out or refused (with a shake of the head





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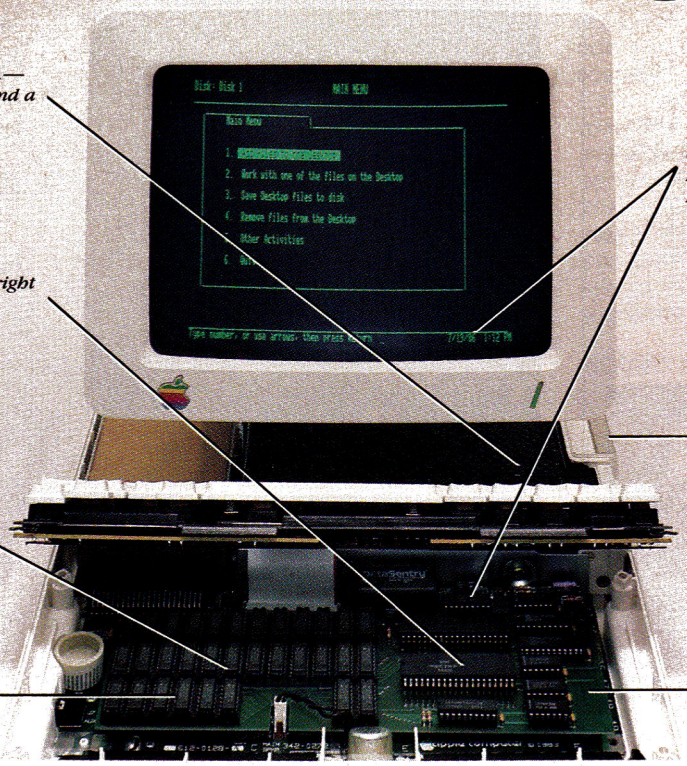

No jumper wires, clips or drive removal—*so installation takes only a few minutes and a screwdriver.*

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Printer buffer *lets you continue working while printing AppleWorks files.*

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Pinpoint's AppleWorks accessories *with RAM enhancement software—together a $118 value—only $79 if ordered with Z-RAM Ultra.*

Run CP/M® programs *with Z-RAM Ultra's built-in Z-80B microprocessor.*

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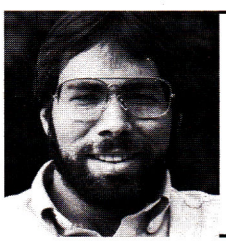

"I recommend Applied Engineering products wholeheartedly." (Of course, Steve's IIc has a Z-RAM installed.)

Steve Wozniak, the creator of Apple Computer

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from Kermit, for example). Rewards for correct responses are lively and appropriate. They range from a simple hop from Kermit to Sam the Eagle saluting the flag while *The Star-Spangled Banner* plays.

The programs are designed for easy use with Muppet Learning Keys, though they also work well with a mouse, Personal Touch Corp.'s Touch Window, or the regular Apple keyboard, given substitutes like Control-E for special Learning Keys buttons such as Stop, Help, Oops, and Zap.

MUPPET MATERIALS

Each set includes program and backup disks and a *Teacher's Guide*. The Muppet Word Book also includes a set of flash cards for the game's vocabulary words.

The *Teacher's Guides* are detailed and thorough. They begin by stating each set's goals, followed by a comprehensive chart correlating kindergarten skills in language and fine arts, mathematics, science, social studies, and problem solving with activities in the two Muppet sets and Sunburst's Discovery package.

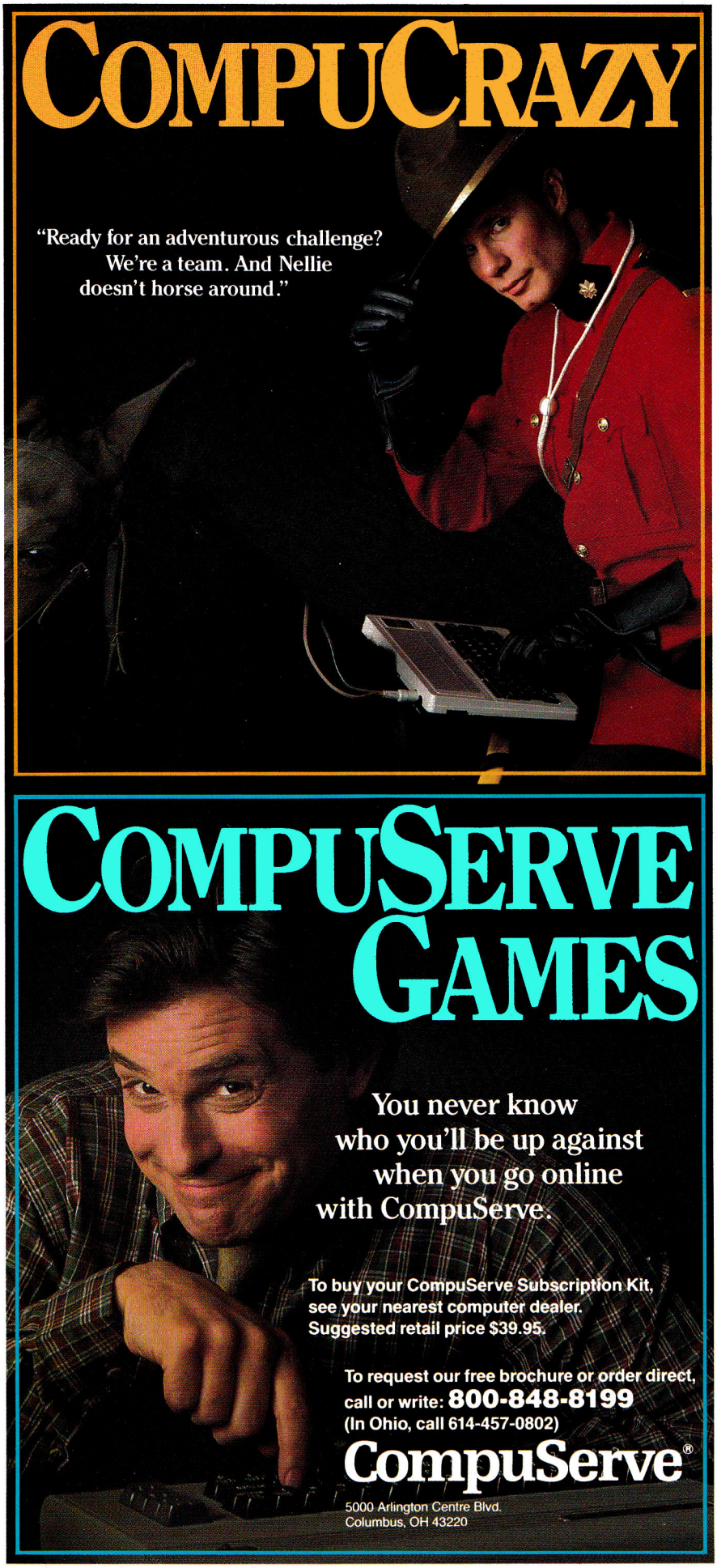
The *Teacher's Guides* also include lesson plans for using the programs with a class, as well as lessons for introducing the material before using the computer. They also state any prerequisite skills. Clear instructions are given on basic use of the programs, as well as how to modify most of the activities to increase their difficulty, change their emphasis or focus, and so on.

While the *Teacher's Guides* are generally well thought out, I found the sample worksheets dull and uninteresting. A redesigned worksheet with an illustration or a Muppet drawing would be much more attractive to children.

MUPPETVILLE

Muppetville features an extremely appealing on-screen town. Kermit pedals up and down Main Street on his unicycle, stopping in front of each building. Players can then enter the location or steer Kermit to another.

Three Muppetville activities are Concentration-type games, with matched pairs behind numbered windows in a building. Sam the Eagle's School compares numbers with corresponding dice. Animal's Apartment House matches simple songs. The Statler Waldorf Hotel matches shapes, with the option of adding color discrimination as well.



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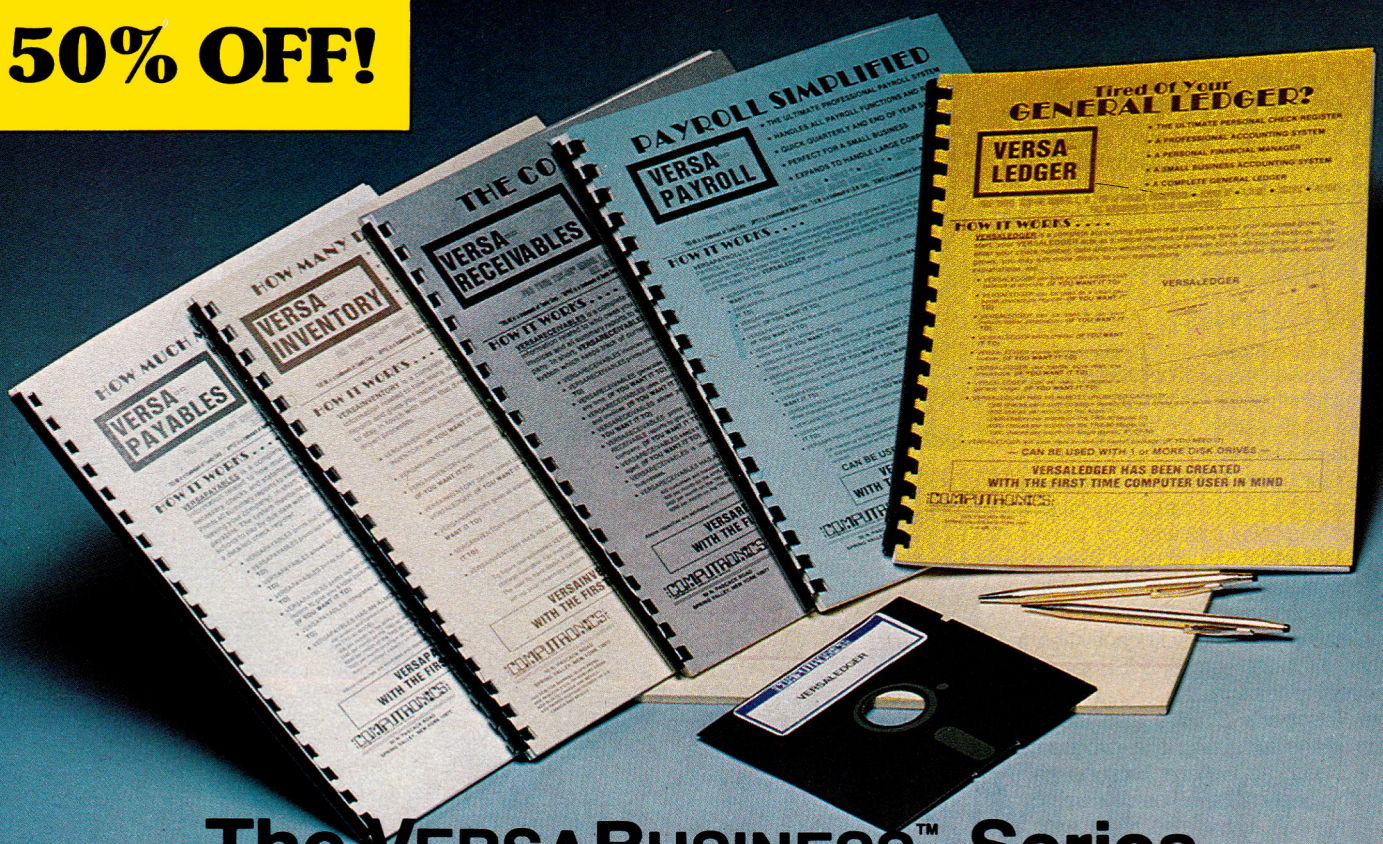

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Gonzo's Zoo involves shape and color discrimination in choosing the different one among four friendly cave creatures. In the Muppet Factory, Bunsen and Beaker produce simple addition problems. In the Muppet Movie Theatre, projectionist Miss Piggy shows on the theatre screen an object whose name begins with the letter a child types. Objects are drawn to stress basic shapes—a rectangular radio or big round nose.

Muppetville's witty variety of games, graphics, and sound makes the package very attractive to children. The package provides an interesting and fun way to practice recognition skills, with a bit of math and the alphabet thrown in.

MUPPET WORD BOOK

The Muppet Word Book begins with an image of the book's cover on screen; a furry paw turns the page to reveal the table of contents. Children then choose from six chapters, each a different activity.

In the Parking Lot, children help Kermit direct letters and nonletters (shapes, numbers, and other symbols) to separate parking garages. The Elevator game has Scooter taking lowercase letters up to the corresponding capital letter. For Pigs in Space, Miss Piggy and Link Hogthrob, aboard their spaceship, show words and objects floating through space as children press corresponding letters.

At the Circus, Gonzo is fired from a cannon, carrying an initial consonant selected by the child, to collide with and complete a word. In the Muppet Labs, Bunsen and Beaker conduct a similar experiment in reverse, with children picking a word ending to follow an initial consonant. Finally, Muppet Words is a beginner's word processor, a slate on which children can type letters, words, and simple sentences. The program can also print typed text, making it possible for children to produce their own books.

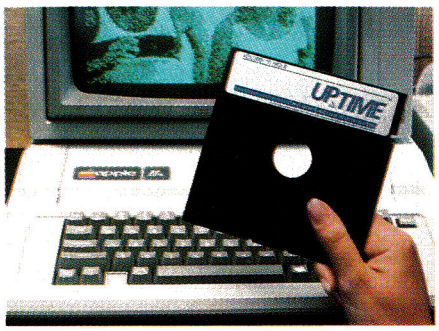
The Muppet Word Book has more appeal to first- and perhaps even second-graders, as it requires more reading skills than Muppetville. Preschoolers have a harder time with this set. Kindergarteners would enjoy the activities, but would need help with some of the reading.

MUPPET MANIA

Muppetville and the Muppet Word Book would each make a nice addition to an elementary school's software collection. They have enough flexibility to be used at several levels of difficulty. Preschools with computers should also consider these sets.

Because the programs meet a fairly broad age range (I tested them on three-year-olds to first-graders), some parents might consider them for home purchase. My children used the programs over and over and never tired of them. My three-year-old delighted in Statler hidden in the hotel and Kermit on his unicycle, while my six-year-old enjoyed the challenge of matching songs, making words, and doing addition. ■

Lisa Gerchman
Keene, NH



Booting the Issues

UPTIME FOR THE APPLE II

Viking Technologies Inc., The Travers Block, 174 Bellevue Avenue, Newport, RI 02840

Magazine on disk; 64K Apple II or later
$11.95/issue, $69.95/year (12 issues)
Rating: ■■

Continued on p. 92

Computer Talk

The Echo IIb speech synthesizer is compatible with the Apple®IIe, II+ and the new Apple IIGS. It offers both text-to-speech and natural sounding speech capabilities. Its unique text-to-speech program gives the Apple an unlimited vocabulary. The Echo IIb also features distinctive natural sounding speech in a female voice. This fixed vocabulary of 720 words is supplied on disk and can easily be added to BASIC programs.

The Echo IIb, like the Echo II, Echo+, and Cricket,™ is compatible with numerous educational and special needs programs from over eighty software manufacturers. Contact Street for a list of companies offering these talking programs.

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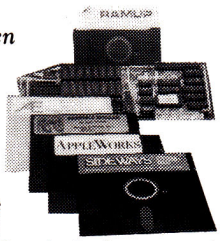

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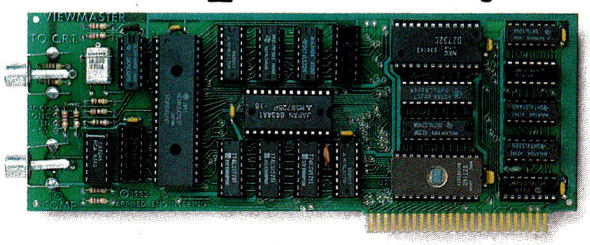

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One look at the chart will give you some of the reasons there's only one smart choice in 80 column cards for your Apple. But the real secret to Viewmaster 80's success is something even better: Total compatibility.

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

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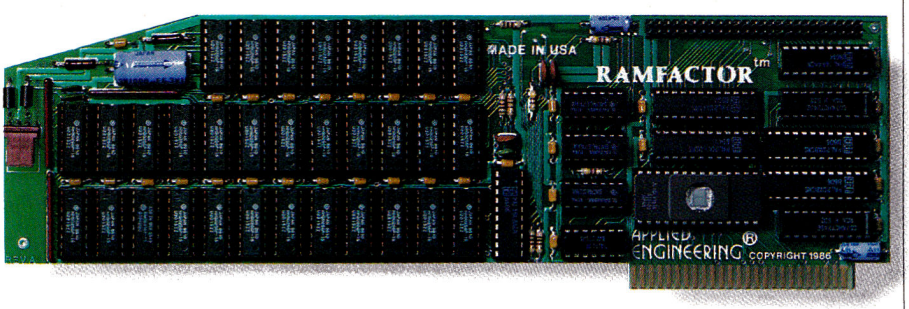

Very Compatible

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 to anyone with an Apple IIe, IIGS *or* II+ with an 80 column card. RamFactor, no other standard slot card comes close to enhancing AppleWorks so much.

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RamFactor has a built-in 65C816 CPU port for direct connection to our IIe 65C816 card for linearly addressing up to 16 MEG for the most powerful 16 bit applications. (II+ 65C816 card under development.)

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With RamFactor, you can organize memory into multiple work areas and switch between them. Each work area can contain different programs and even different operating systems. Now you can switch from one program to another or even switch from AppleWorks to DOS 3.3 to CP/M to Pascal to ProDos in under a second. And with our Battery back-up option, you can have permanent storage for up to 20 years.

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Good writing is more than simple word processing. inCider *looks at a variety of accessory programs, from outliners to spelling checkers, that can help you polish your prose.*

BEYOND WORD PROCESSING

by Cynthia E. Field

Have you noticed how advertisements for word processors begin to sound like commercials for Vegamatics? You can cut. You can paste. You can block-delete. You can change margins. Ten years ago, when the Apple was born, such functions inspired awe. But as the saying goes, that was then; this is now.

Today, any word processor can transform your Apple into a glorified typewriter and work wonders reconfiguring your sentences. But few word-processing packages even mention the essential ingredients of skillful writing—the ideas and style that imbue your paragraphs with the power to convince or persuade.

Word-processing accessories, though—"thinking" software and editing programs—can polish your writing and help you get your ideas across more effectively. Whether you're preparing personal letters, business reports, term papers, or articles for your favorite computing magazine, you should investigate the variety of Apple II writing-support systems.

GREAT! SOFTWARE THAT WRITES *FOR* ME!

Not quite. Word-processing accessories, such as outliners and spelling checkers, may actually make the writing process more challenging—at least at first. Not that these programs are difficult to use—they're not. The rub is this: Once you see the professional touch these programs add to your writing, you may be hooked. And this addiction can command a serious time commitment—not only to run the programs, but to think hard about the words you choose and the way you blend them into sentences to convey clearly your intended meaning.

Not everyone needs word-processing accessories to make his or her writing shine. But if you're among the millions who ignored your composition teacher's warnings ten, 20, or 30 years ago, you could probably use an outlining program to organize your ideas, or a grammar checker to present those ideas more clearly.

SEIZE THAT IDEA

The first, and often the most turbulent, task in writing is to find something to write about. Some people claim to be inspired in their sleep. For most of us, though, the kernel of an idea appears only after painfully conscious thought.

Writer's Helper, a full-featured composition program from Conduit, offers a brainstorming module to help you find a topic. This free-writing exercise encourages you to type anything that comes to your mind, as fast as you can, without editing or censoring. When you finish, the program follows up with questions such as "Looking back at what you typed, which idea surprises you the most?"

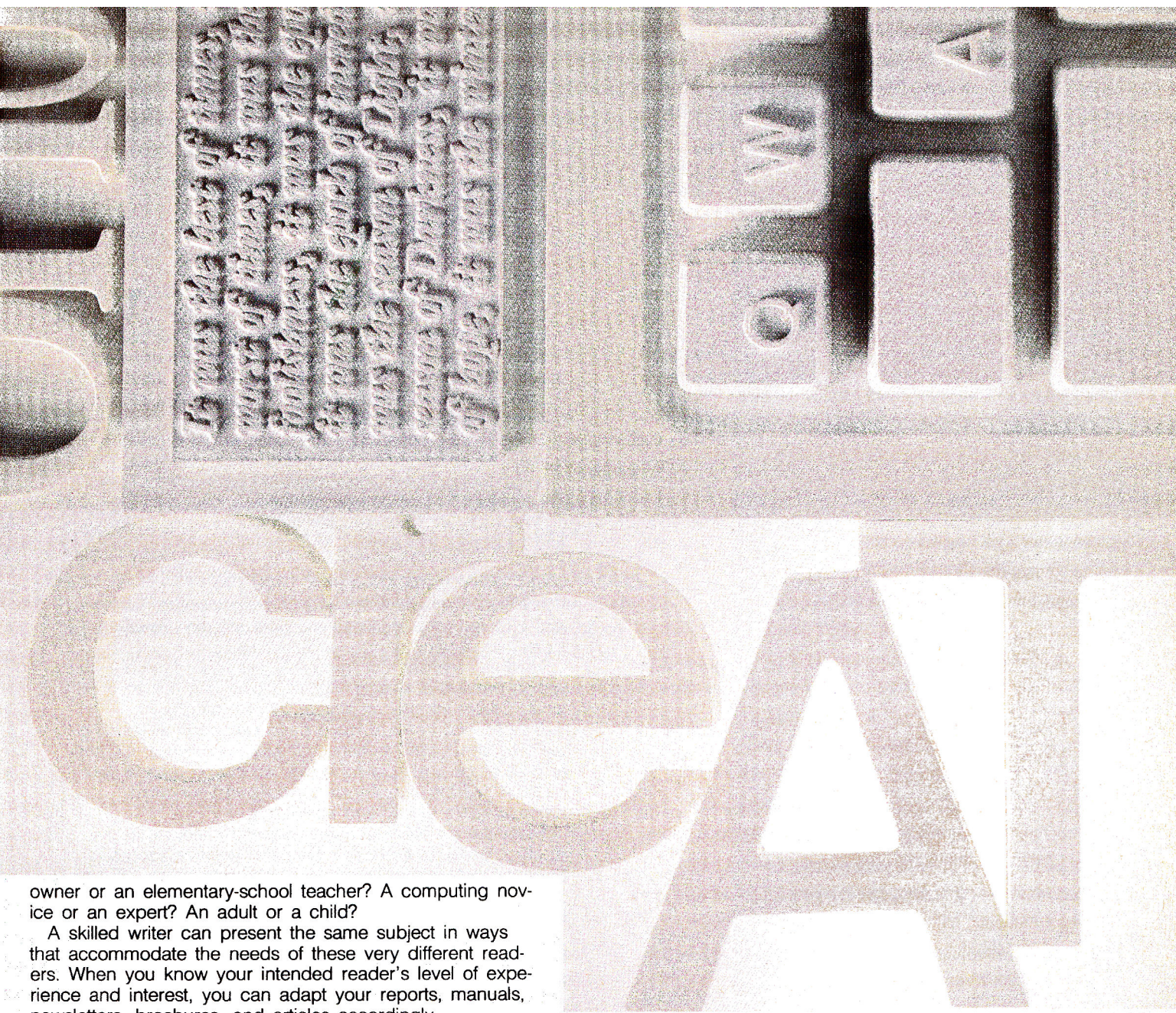
Then to develop that topic, another program module helps you visualize your subject as part of a process, contrast it with something else, or address questions supplied by a teacher.

Writer's Helper is designed for composition classes in junior high school through college. If you have children in this age group, you might consider Writer's Helper a valuable program for the whole family.

KNOW THY READER

You may think that once you have an idea you're ready to boot up the old word processor. Not so fast! Take time to know your intended reader.

Depending on his or her interests and needs, you might collect different types of information about your topic—and slant your expression to fit that reader's expectations. Is your reader a lawyer or a librarian? A mom-and-pop-store



owner or an elementary-school teacher? A computing novice or an expert? An adult or a child?

A skilled writer can present the same subject in ways that accommodate the needs of these very different readers. When you know your intended reader's level of experience and interest, you can adapt your reports, manuals, newsletters, brochures, and articles accordingly.

Before preparing a piece for a computing magazine, for instance, you could scour back issues to learn which subjects appeal to its readers. Some magazines are highly technical, with articles devoted to programming. Others take a lighter approach, with features geared toward various members of the family. Still others cover the gamut, but focus on the Apple II user with an intermediate level of computing experience.

Another way a writer can determine his or her intended reader's level of sophistication is by calculating a *readability index*. You can perform these computations manually with any one of a number of accepted formulas, such as the Fogg Index or the Bormuth Formula.

With the right software, though, the Apple can make these determinations much more quickly and easily. **MouseWrite**, a word processor from Roger Wagner Publishing (see Editors' Choice, July 1985, p. 112, and Reviews, March 1986, p. 70), includes a built-in reading-level indicator. **Writer's Helper**, the composition program from Conduit, also contains a reading-level-determination module. Educational Activities publishes **Readability Index**, an inexpensive, stand-alone assessment program.

With each of these reading-level accessories, you need only type in a few paragraphs of text (your own or someone else's), and the program determines a readability factor, based on the academic grade level necessary to comprehend the text. Besides the grade level, Writer's Helper offers a word of congratulation: "Nice job. Your writing closely matches the reading level of your audience." Because built-in formulas vary—some emphasize number of common words, while others stress sentence length—grade-level determinations may vary somewhat from one readability program to the next.

KNOW THY SUBJECT

You have a great idea. You know your reader. Are you ready to start up MultiScribe or Apple Writer? Not yet.

The third step in the writing process involves research—collecting information so that you'll say something awesome, or at least pertinent. Traditionally, this information comes from printed works stacked on library shelves or preserved on microfilm.

Apple users frequently overlook the computer accessories they already own that can help them retrieve and keep track of promising facts, figures, and anecdotes. Whatever kind of information you need, you can probably find it by using your modem and communications soft-

ware. Vast storehouses of knowledge—electronic libraries—are just a phone call away. You can access general-information databases through **CompuServe**, **The Source**, and **GEnie** (see Reviews, May 1986, p. 38), or you can subscribe to specialty databases such as **Dow Jones News/Retrieval** or **NewsNet**. (See "On-Line Sampler," June 1985, p. 15, and "What's On Line?", May 1986, p. 44, for more information.)

Have you ever considered your database program as a word-processing accessory? Just as surely as index cards were prerequisites for the term papers you wrote in high school and college, database records can help you keep track of who's who, what's what, and who says what.

You've invested time and money collecting information—so why not store it in an **AppleWorks** or **Bank Street Filer** database? If you need a more flexible, free-form, ProDOS database, test-drive the new **ProFiler**. (See "What Do These People Have in Common?", November 1986, p. 85, for more information on Apple II database-management programs.)

A free-form database releases you from the limitations of AppleWorks-type "labels and tables" reports. You could even use a free-form database as an electronic notepad—type notes and quotes directly into the database as you conduct interviews by telephone.

CAN I WRITE NOW?

Not yet. Sometimes when you research a topic, the information miraculously sorts itself into tidy mental piles. More often, it doesn't.

Not so long ago, you'd begin organizing your data by scribbling an outline on paper. The more you thought about the relationships among various pieces of information, the more subheadings you had to add. Pretty soon, you had arrows and "insert" notations all over the page. You learned that a well-developed outline is much more than a simple shell game.

Today, outlining programs for the Apple II can help you organize nearly any volume of information. First, you construct the main framework of your article or report. To this brainstorming function, add the ability to delete, move, or add information at will—while the outline automatically reformats on screen.

Outliners also let you expand and contract your framework whenever you want. You can show only main headings, or you can zoom in on various sublevels. These features help distinguish outliners as totally fluid thinking tools.

Two such "thought processors" are **ThinkTank**, from Living Videotext (see Reviews, April 1984, p. 146), and **ThinkWorks**, from Megahaus (see Reviews, September 1986, p. 32). These programs are similar in content and price. Both help you prepare formal outlines for papers, reports, and articles. ThinkTank's interface is more traditional; ThinkWorks sports the stacking-file-card interface AppleWorks popularized. You can export to AppleWorks outlines prepared with either program, too.

Using word-processing accessories to get organized makes the actual writing process a snap. You have an enticing topic; you're knowledgeable; and you have a "cheat-sheet" to guide you all the way.

So go ahead. Boot up your word-processing program and type your first draft.

WHAT DO YOU MEAN—FIRST DRAFT?

The sad truth is that even after brainstorming, researching, outlining, and writing, your work still isn't ready to be submitted to your boss, teacher, or client.

Another essential, but frequently overlooked, step in the writing process is editing. Some people can edit their own work. Others impose on literate, patient friends.

But can you name a more patient friend than your Apple? Blinded by the brilliance of your own prose, it's easy to miss typos and spelling errors when you read a document. A spelling checker can proofread your word-processing file simply and accurately.

There are probably as many spelling checkers in the Apple II world as there are weeds in the average lawn. Spelling checkers are even standard components of some word-processing packages. But whether integral or separate, spelling checkers vary in only limited ways.

Some, such as **Sensible Speller** and **Webster's New World Spelling Checker** (see Reviews, January 1986, p. 67), are noninteractive. While they check the words in your document against their word lists, you can take a coffee break or make a phone call.

When the program is finished, it alerts you to suspected errors and gives you the opportunity to make corrections right away, to flag suspect words for correction later (using your word processor), or to add a term to the checker's word list—somewhat erroneously referred to as its dictionary. A custom-dictionary option, with which you create your own word list, is an especially useful feature for science and technology writers and others whose jargon isn't usually found in standard dictionaries.

Spelling checkers commonly boast large word lists (114,000 for Webster's New World Spelling Checker; 81,000 for Sensible Speller). For most people, these built-in dictionaries should prove adequate. If you own Sensible Speller and have specialized requirements, you can purchase additional lists, including **Black's Law Dictionary** (20,000 words), the **Sensible Technical Dictionary** (47,000 words), and **Stedman's Medical Dictionary** (65,000 words).

Most spelling checkers require that you boot them independently, then import a file stored on your word-processing data disk. A more convenient approach for those who make few typos and spelling errors is to use the **Pinpoint**

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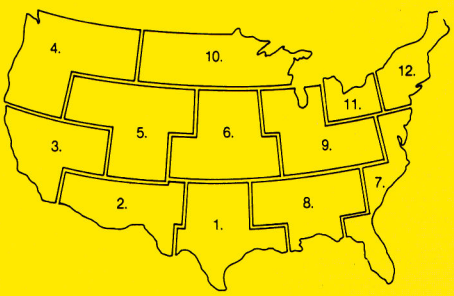

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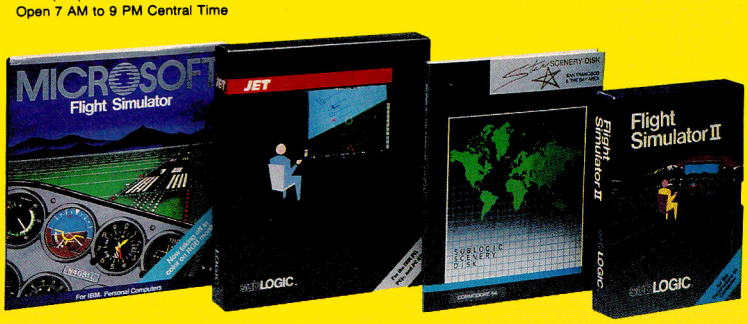

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Spelling Checker (see Reviews, October 1986, p. 27), which pops up within the AppleWorks word processor. You can write a paragraph, check the correct spelling of a word, and return immediately to your paragraph—without ever switching a disk or booting a new program.

For this level of convenience when you're spot-editing, the Pinpoint Spelling Checker is unsurpassed. This accessory is "dead in the water," though, when it comes to longer documents. Each time the Pinpoint Spelling Checker finds a suspect word, it alerts you immediately. Checking a 22K file with Sensible Speller may take seven minutes, while proofing the same file with the Pinpoint Spelling Checker can take as long as an hour.

For documents longer than a page or so, Pinpoint Publishing recommends its **Document Checker**. The company claims that this program, which doesn't require Pinpoint or AppleWorks, can speedily look through as many as 16 files at once, without interruption.

HONE YOUR WRITING SKILLS

Another word-processing accessory that can help you fine-tune your writing is a grammar checker. **Writer's Helper** offers word-analysis modules that check your document for incorrect homonyms, gender-related language, and passive voice.

Sensible Grammar ventures beyond these kinds of errors and highlights pompous language and cliches, as well as vague or informal expressions. In all, Sensible Grammar can recognize about 2000 erroneous phrases.

This unique word-processing accessory helps improve your style by highlighting questionable words and suggesting alternatives. You may not want to rely completely on Sensible Grammar, though; on a number of occasions, the program would have let me use commas incorrectly. But with a standard English handbook, Sensible Grammar can provide the leg-up you need to elevate the quality of your writing from mediocre to noteworthy.

RIBBONS AND BOWS

After all the effort you've expended, you finally have a manuscript of which you can be proud. You can format the finished product with your word processor and use a good-quality ribbon in your printer to make a hardcopy. Dot-matrix type is becoming more acceptable, but letter-quality print, such as that generated by a daisywheel printer, is still preferred by many business professionals, teachers, and editors.

Once you submit a report, should you sit back and wait for praise, paychecks, and promotions? No way! Start brainstorming your next idea. When people see how professional your work is, you'll be hard-pressed to keep up with the demand. You've discovered that real writing begins where word processing leaves off. ■

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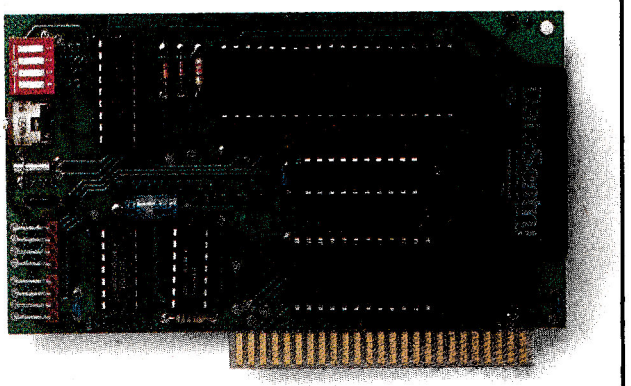

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ENHANCING APPLE WRITER

Apple Writer is a powerful word processor, but it may be even more powerful than you think. With a few tricks, you can time- and date-stamp your files and add a RAM disk—with no additional hardware or software.

by Jonathan T. McPhee

I'm no programmer, but as an experienced Apple II user, I like to get the most out of the programs I buy. The ProDOS version of Apple Writer II is one of the best word-processing packages I've used. It does lack a few nice touches, such as automatic footnoting and a what-you-see-is-what-you-get display that would make life easier, but it does so many things so well that it's still my first choice.

Unfortunately, a few ProDOS features didn't make it into Apple Writer's repertoire—at least as menu options. For one thing, you can't date- and time-stamp your files from within the program without spending a hundred bucks on a clock card. Also, the Apple Writer disk's startup program apparently wipes out the RAM disk ProDOS ordinarily sets up in your extended 80-column card's auxiliary memory, and zeroes the clock locations in ProDOS.

MAYBE YOU CAN...

Late-night speculation led me to some fooling around with my ProDOS User's Disk (System Disk for you IIc users) and the Apple Writer master disk. I came up with a simple way, using only those two disks, to regain the time-stamp and RAM-disk features—without spending a nickel on an expansion or clock card.

I'm sure my use of ProDOS and Apple Writer would make a programmer cringe. The "proper" way to do this kind of stuff is to write an elegant patch. But I lack the time to learn machine language, figure out the intricacies of ProDOS and Apple Writer, and conjure up the correct code. Like the majority of computer owners, I'm an "appliance" user—I want only the most efficient application of those expensive programs I bought.

The trick is simple, but if you don't have an extended 80-column card, you can't set up a RAM disk. Time-stamping, though, works on any IIe or IIc.

GETTING STARTED

First, boot up the ProDOS User's Disk or the IIc System Disk. From the opening menu, select item T—"Display/Set Time"—and follow the prompts to automatically POKE the date and time of your choice into the correct locations in your Apple's memory. The program returns you to the ProDOS opening menu, where you choose B—"Exit to BASIC." You'll see the Applesoft prompt (]) appear.

Now place the Apple Writer master disk into drive 1 (the internal drive in a IIc), and call up Apple Writer—but *don't* do it by booting the system with Control-Open apple-Reset, PR#6, or anything else. Instead, type PREFIX,D1 (Return), to set your Apple Writer master disk's volume name as the default volume under ProDOS. Next, use ProDOS' "generic" RUN command, the dash (-), to run the main Apple Writer program: Type -AWC.SYS (Return). This shoots you to Apple Writer's opening screen, and another keypress takes you to the editing screen, where you can use Apple Writer as usual.

FOR OWNERS OF 2.1

Note that if you have version 2.1 of Apple Writer II, there's an additional step. Apple Computer changed the ProDOS "filetype" of Apple Writer's program files from the straightforward .SYS (SYSTEM) file to an SOS type. The generic RUN command (-) won't run this filetype, and you'll get an error message. So pull out your handy disk-

sector editor, whether you use the ZAP program from *Beneath Apple ProDOS* or one of the bit-copy programs, and go to track $00, block $0B.

Find the AWC.SYS filename, and count 15 bytes from its beginning. You should find a value of $0C in this position, which translates to an SOS filetype. Change this to $FF, the SYSTEM filetype code, and write the block back to the disk. Make sure you're doing this only on a backup copy of your master disk, which you can make with the FILER copy-volume utility on your ProDOS system disk. Now go ahead and follow the instructions in the previous paragraph for booting the User's/System disk and running the AWC.SYS program.

TESTING YOUR RAM DISK

You've now installed the ProDOS RAM disk, and any files you create and save to disk will also include the date and time in the catalog/directory entry, just as if you had a clock card and Apple Writer's author had hooked up all the ProDOS features.

Just for fun, type Control-O followed by A-E, "List Volumes On Line," to see the entry for "/RAMdisk." Set the Prefix to /RAM with the G command from the "ProDOS COMMANDS" screen, and use the A command to catalog your new RAM disk. No files are present yet, but 119 or 127 blocks of instant-access storage are available to you.

Type a few words on the editing screen, or load a file from another disk after changing the default disk PREFIX to the name of the other disk. Now set PREFIX back to /RAM. Press Control-S, type the filename, and hit return to save the file to the RAM disk. (Note the speed and silence as your file is saved.) Catalog the RAMdisk again. The creation and modification dates in the catalog entry have been filled in with the date you entered previously, as they will be on saves to a floppy disk.

NOBODY RIDES FOR FREE

There's no free lunch, of course. Your editing space has been reduced from more than 45K to about 23K under AWC.SYS, which, unlike AWD.SYS, was written for 64K machines. This is still enough room for about eight single-spaced pages of text, or about 450 lines, and the RAM disk's speed at loading and moving files can more than make up for the smaller editing space. You can use the CONTPRINT WPL program on your Apple Writer master disk to merge and print several files if you have a longer document.

If you want to date-stamp your files, but have no use for the RAM disk and would rather have the full 45K of editing space, that's no problem. From BASIC, use the generic RUN command to run AWD.SYS: -AWD.SYS (Return). This program won't recognize the RAM disk, but it leaves the date-stamp feature intact. In version 2.1, the AWD.SYS filetype is again an SOS file, and you'll have to use a sector editor to change the $0C filetype byte to an $FF, as described above.

BLOCK MOVES WITH THE RAM DISK

The RAM-disk trick is probably most helpful to the writer or businessperson who uses his or her Apple for word processing over long periods. It's easy to create a WPL startup program that will, for example, transfer a set of boilerplate files, mailing list, or special set of glossary, print, and tab files from your disk drive to the RAM disk. There another WPL program can access them easily and quickly to assemble forms or form letters, or support your particular stylistic quirks.

Your RAM disk can also partially fix one of Apple Writer's weaknesses: block moves and copies of large chunks of text. Apple expects us to make block moves and copies by counting off 1024 or 2048 characters, deleting them (heaven forbid), then magically pulling them back out of a secret file buffer with the control-W and control-X commands. It's safer and more convenient to use Apple Writer's partial-file-save feature to save those multiparagraph blocks of text to a unique file on the RAM disk, then load them (Control-L) at the new location. The command sequence is as follows.

First, mark the end of the block of text you want to move with unique characters, say, "XXX." Now move the cursor to the start of the block of text. Press Control-S, type the filename followed by !XXX!, and press Return. Apple Writer does the rest. Delete the saved text, if you want to, with Control-X and Control-W (instead of the slow delete key); type Control-L followed by XXX to plug the text back in after moving the cursor to the new location.

Apple Writer is my favorite word processor, and I've used a bunch of them. As with the Apple II itself, one of Apple Writer's great strengths is its "open architecture" and flexibility. Even though I'm not a programmer, I take a child's delight in discovering and extending the usefulness of my software with tricks like the one I've just explained. I hope you'll find it helpful.■

Jonathan McPhee is an attorney and free-lance journalist. Write to him at 7320 North Winchester #2E, Chicago, IL 60626.

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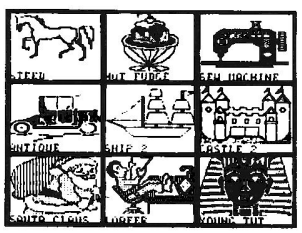

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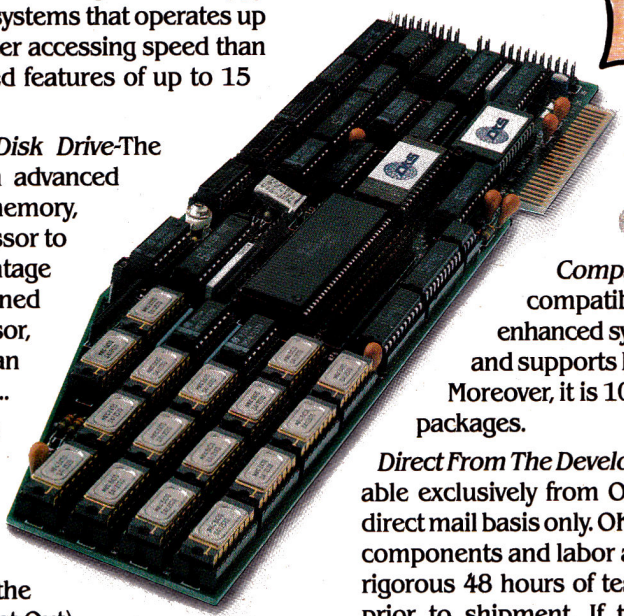

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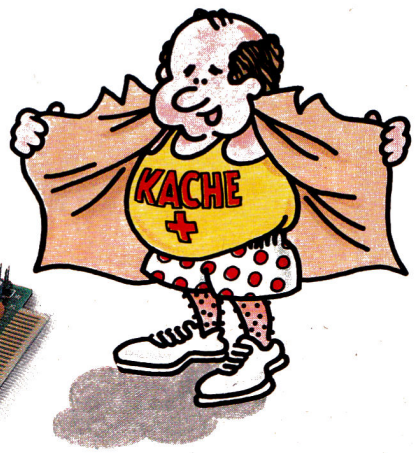

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THE CLASSROOM OF TOMORROW

What if every student had access to a computer all the time—at school and at home? That's what Apple wondered, so it dreamed up the Apple Classroom of Tomorrow.

by Peter Jordan

"Sure, I know I ought to get the kids a home computer. But we have enough trouble putting food on the table and shoes on their feet. We can't afford a home computer." ***—a parent***

"There's a ton of educational software out there, but at least half of it is junk. Even if we did have a laundry list of good software, we probably couldn't afford to buy enough copies to really make a dent." ***—a principal***

"Computers would probably help students learn in all subjects, but we don't have enough machines to give all the kids time at the keyboard once a week, let alone all day." ***—a teacher***

"We used a neat computer program in Social Studies today, but we had to take turns, and I never got a chance to really see how it worked." ***—a student***

Educators are excited about what computers can someday do to enhance education, but there's never enough hardware, software, time, or money to really explore the possibilities.

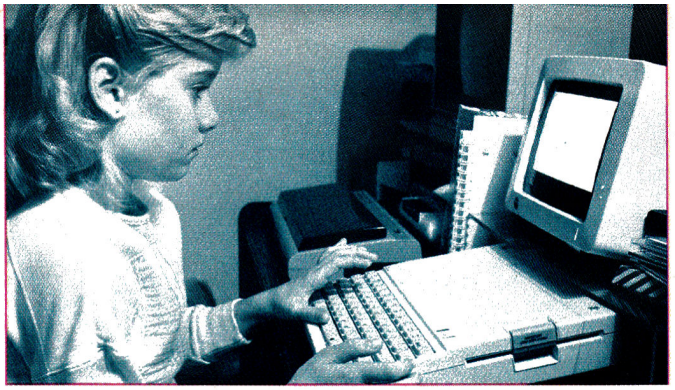
The crystal gazers tell us that at some time in the future, these problems will disappear. Computers will be as common as pencils, and students will use them in the classroom and at home as a matter of course.

But today's educators usually run up against the barrier of limited resources when they try to realize the full potential of computer possibilities.

In a fourth-grade classroom at a suburban Nashville, Tennessee, elementary school, however, there are no barriers to computer access. Through its Classroom of Tomorrow project, Apple Computer is giving students, teachers, administrators, and parents a glimpse of the future—a taste of a world in which all barriers to total computer access are lowered.

Every student in Faye Wilmore's fourth-grade class at the Dodson Elementary School not only has an Apple IIe computer on his or her desk, but also a IIc at home. From social studies to science, from in-class quizzes to homework assignments, students have access to an Apple II to help them learn at their own pace.

Dodson Elementary's fourth grade is one of six classrooms in schools across the country participating in this educational experiment. (The others are the fifth grade at Lester Demonstration School, Memphis, Tennessee, profiled in the accompanying sidebar; a fifth-grade class at rural Blue Earth Public School, Blue Earth, Minnesota; low-income sixth and seventh grades in Eugene, Oregon; a ninth-grade class at inner-city West High School, Columbus, Ohio; and a third grade at Stevens Creek School in suburban Cupertino, California, Apple's home town.) The Apple Classroom of Tomorrow (ACOT) provides almost unlimited computer resources, letting kids use Apple IIs whenever and wherever the machines may help expand their educational experience.



"We're using today's technology as a simulation of the future," says Apple's Dr. Martin Engel, project manager for the ACOT program. "Apple's doing this to see what the future looks like."

That future looks fine, say students, teachers, parents, and administrators involved with Dodson's ACOT fourth-grade classroom.

"If Apple Computer were doing this to sell us computers—which they're not—we'd buy one," says Dr. Richard Herrington, a Baptist pastor and father of nine-year-old Holly, an eager participant in the Classroom of Tomorrow at Dodson. Herrington says Holly used to spend long hours in front of the television, but now she's apt to be in front of another screen, the monitor of her IIc, doing homework or playing educational games.

MORE THAN COMPUTERS

The most visible evidence of the ACOT project is the hardware—the computers on every desk and in every student's home. But there's more than a collection of computers involved in this experiment.

Apple pays for an extra teacher to work as computer coordinator with the classroom teacher. With two teachers to share the load, suddenly there's time to examine software and break out of the routine. And the software itself is free from several participating companies, letting teachers get as many programs as their students can use.

If the right software is available, teachers can use Apple IIs in every subject, says Wilmore. She says she hopes to find software to teach handwriting, but she began with something more mundane: typing software, so the kids will know where the keys are and be able to use programs like **AppleWorks** more efficiently.

Students have been learning typing with **Keyboarding Primer**, a program from the Minnesota Educational Computing Consortium (MECC), but Wilmore says she plans to shift to **Type to Learn** from Sunburst, because it also has a management system that lets her keep track of the students who need practice on specific letters.

The typing practice is paying off. "I was fiddling with the computer the other day, and Holly said, 'Daddy, you should keep your fingers on the home keys,' " says Herrington.

Wilmore insists that by the middle of the year, her fourth-graders had become so proficient at the keyboard that they were typing their assignments faster than they could write them by hand.

Wilmore and fellow Dodson ACOT teacher Robert Howell think their students will eventually spend half their instructional time at the keyboard in courses like math and reading, so the logical first step is to teach students to be proficient typists.

A DAY IN THE LIFE

At Dodson, the school day begins at 9 a.m. with a 15-minute free period, when ACOT students can use whatever software they want. A big early favorite was **Word Munchers** from MECC; then students discovered Broderbund's **Where in the U.S.A. Is Carmen Sandiego?**, a game that helps reinforce social studies because students have to learn characteristics of various U.S. cities to find the villain.

After their free period, students settle down to work on math skills. They're apt to spend as much as half their time in math class at the keyboard with MECC or Scott Foresman software. The Fisher-Price **First Men in the Moon Math** program is also popular for reinforcing skills with which the student may be having difficulty.

In science class, students use AppleWorks to build databases of facts about the subjects they're studying and learn to take notes emphasizing the main ideas. When they studied sound, they also used Harcourt Brace Jovanovich software to make music, but they had only one copy of the program, Wilmore says, so they had to write music as a group.

With Scott Foresman software tied directly to the stories the students read, computers are woven tightly into the reading class at the Dodson ACOT classroom. MECC software also helps reinforce specific reading skills, and students are keeping a journal of their reading with Spinnaker's **Kidwriter**.

"In the beginning, Kidwriter was much easier to use than AppleWorks, so we decided to use it all the way through," says Wilmore. Kidwriter is also attractive because it lets student authors add graphics to their journals.

Product Information

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(800) 826-1330 (IL)
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Keyboarding Primer, $59
Oregon Trail, $49
Word Munchers, $49
MECC
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St. Paul, MN 55126
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In language arts, the ACOT students are using Sunburst punctuation software and a variety of MECC packages, including programs that help them write stories.

As in science, the most popular program in social studies is AppleWorks, which kids are using to create databases of important facts.

The popularity of AppleWorks with her fourth-graders, in fact, has been one of the biggest surprises to Wilmore. "You wouldn't think it would be their favorite, but it is—because they can do so many things. They're even using it in math to check their answers."

Their computer-assisted education doesn't end for the ACOT students when school lets out in the afternoon. They'll often have homework assignments to do on their IIcs at home—perhaps science or social studies to type into their databases, or some math to practice if they didn't achieve their objectives during school hours.

They can also check out software like MECC's **Oregon Trail** from a library in the ACOT classroom. The home computers, Wilmore says, have been so popular that several students asked for their own IIcs for Christmas: "When I asked them why they wanted a computer for Christmas when they already had one, they told me, 'But you're taking them away from us in May.' "

YOU'VE GOT TO SEE IT...

Students are also enthusiastic about computers at school. "One of the remarkable things about the ACOT program," says Engel, "is that it's hard to describe. You've got to see the kids interact. It's spontaneous peer teaching. They spin their computers around to show each other what they've got on the screen. School isn't boring anymore."

That spontaneity was unleashed at Dodson when students created science projects on space. They broke up into groups of four, used AppleWorks to write their reports, Logo to program graphics, and Broderbund's **Print Shop** to produce covers for the projects.

"It was wonderful to watch," says Wilmore, who stood back and let students choose subjects and develop reports on their own. "They worked basically on one computer. No one was assigned to be in charge of each group, but they developed leaders on their own. They did all their own organizing, deciding what specific subjects to cover as they wrote their outlines."

Does all this individual instruction create discipline problems?

"I know you're not going to believe me, but we don't have any discipline problems at all in that room," says Wilmore of her ACOT children. "I've never had a classroom before with no discipline problems at all, and some of these children have had them before." Only during lunch and physical-education class is there an occasional problem—the only two periods when students don't use computers.

"Computers allow a greater flexibility the teacher can control," says Engel. "You can tailor-make an instructional agenda for each kid."

Computers in the classroom, Engel believes, can be a "turn-on" for teachers as well as students. "They feel they're into something, that something's happening here. It's not just boring routine."

One reason students and teachers are finding computers more interesting is that people are slowly giving up the notion that everyone should learn to program. In the ACOT classrooms and in many other schools, the emphasis is more on using software others have written than learning to write it yourself.

But some programming knowledge can help give young people a sense of mastery over these machines. "He was so excited he couldn't keep quiet," says Wilmore of a young Classroom of Tomorrow student after the fourth-grader wrote his first Logo program. "He was beaming all over."

When the Dodson students did their space projects, Wilmore says she deliberately refused to tell them how to draw a circle with Logo. When one boy figured it out on his own, she recalls, "everyone gathered around his computer to see how he did it."

ACOT CRITERIA

To be chosen as ACOT sites, schools had to demonstrate that they had already made a major commitment to computers in the classroom.

"We're not doing this *to* schools, we're doing this *with* schools," Engel says. "We're making a major commitment, and so is the school." Not only does the ACOT program disrupt usual routine, it also requires an extensive investment in the physical plant, such as wiring, furniture, and air conditioning.

One reason Dodson Elementary earned the right to host an ACOT project is that the school had already invested heavily in computers, largely because of an enthusiastic Parent-Teacher Organization. Ann Zimmerman, copresident of the Dodson PTO, says that independently of the ACOT program, the organization raised $52,000 last year and plans to raise $60,000 this year, primarily from sales of cheese and sausage, to buy computers for the school.

For students to be eligible for the Classroom of Tomorrow, parents had to agree to be responsible for IIcs in their homes. Most Dodson parents, though, have been much more heavily involved than simply signing for a free computer.

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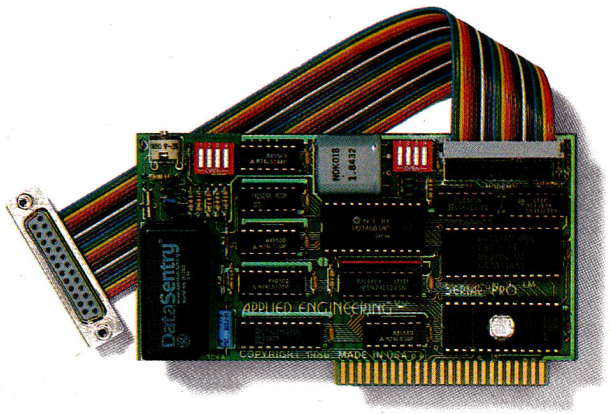

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Electronic Chalk: Telecomputing

For generations, blackboards have been the standard means of written communication between teachers and students. When a teacher had a homework assignment, she would chalk neat instructions in careful Palmer-method script.

At Lester Demonstration School in Memphis, Tennessee, teachers are using a different kind of board to communicate with their students—an electronic bulletin board that lets teachers, students, and specially assigned tutors send group and individual messages.

In the fifth-grade Apple Classroom of Tomorrow at Lester, the kids have modems connected to their Apple IIcs at home. They're signing on after school and at night to exchange messages with each other, talk electronically with their teachers and tutors, and even do homework on line.

Half the students in this inner-city school live in the housing project across the street, and most of them come from families who would have never dreamed of owning a home computer. Now they're using computers to unravel the mysteries of telecomputing.

"As the only ACOT site that has modems, we think we have something special," says Thelma Scott, computer coordinator for the Lester ACOT classroom.

The students apparently agree. Scott says she thought she'd be able to dial up the bulletin board late at night or early in the morning, but when she tried to access it recently, she explains, "It was past 10:30 at night before I could get on, and when I checked it again at 5:00 the next morning, would you believe it? The line was busy!"

To give these inner-city students the extra help many of them need, an older student is assigned as a personal tutor to each student. All students and tutors have their own passwords, computers, and modems, letting them access the bulletin board, which runs on a hard disk at the Board of Education.

IT'S MAGIC

"There's a special magic at that school," says Herrington, who takes two hours a week from his duties as church pastor to work in the classroom. He helps teachers by using the computer to type the lesson plans they must send back to Apple headquarters.

Betty Bruce, whose nine-year-old daughter is in the program, agrees with Herrington: "Victoria is just thrilled. Sometimes kids get bored with school and say they don't want to go, but I haven't heard her say that this year."

Bruce and other parents are helping with the routine chores that can grind the creativity out of any teacher. When Wilmore and Howell need disk copies for every student in the classroom, parents will sit at a computer and make them, and they're also helping with typing and other paperwork.

Parental enthusiasm at Dodson is so high there's almost always a mother or father helping out, and sometimes as many as three parents will be in the classroom at once.

About the only negative aspect of the ACOT program so far is that everyone in the school system can't be in the classroom and have a computer at home. Herrington says his three daughters occasionally have a squabble about who gets to use Holly's computer, and Bruce says she's had to remind her 14-year-old son that it's Victoria's machine, not his.

Bruce says she also notices some jealousy on the part

in Inner-City Memphis

These tutors, most of them from Memphis high schools, are a key ingredient in the program. Students and families are thriving on the special attention.

Students also appreciate the opportunities electronic education offers. "I am so happy to have been chosen as an ACOT student," typed one fifth-grader on the bulletin board. "We are really among those who are lucky, and we should appreciate the opportunity we have been given by the Apple Corporation! I admonish everyone to keep up the good work and to learn as much as possible this year!"

Parent-teacher relationships have also improved, thanks to the ACOT program. Scott says that in the past, fear and distrust were the norm when she tried to contact inner-city parents about their children. They would often tell her she had the wrong number when she tried to call: "Now all I have to do is ask for the child, and I'll hear them hollering 'Oh, It's Mrs. Scott!' "

Parents in the Memphis program had to have ten hours of training before they could take the computer home. "These parents never came to school except when something bad had happened," Scott explains. "Now we see them at school frequently. I remember one mother who didn't look any older than the ten-year-old in our classroom. She came in with her four children, and it was wonderful to see the daughter teaching her mother how to use the computer. The pride on that child's face to see her mother accomplishing something was wonderful."

Another computer-savvy mother sent an AppleLink electronic-mail message to Martin Engel at Apple headquarters: "It gives me great pride to write this letter to you. We've had a computer in our home for about three weeks now, and yesterday while we were in church services, my daughter nudged me and said she wished the minister would hurry and finish so she could go home and use her computer."□ **—P.J.**

of Dodson students who aren't lucky enough to be in the ACOT classroom.

SCARING OFF SOCIOLOGISTS

Apple describes its program as a "long-range, field-based, action-research project," but Engel had to scare off some social scientists who wanted to look at the program as a controlled experiment.

"You don't pull trees up by the roots to see if they're growing," he insists. "They wanted to bring in testing people who would do pre- and posttests, but you don't take a half-built car and see how fast it will go."

Instead of testing and comparing ACOT students with students of similar profiles, Engel is emphasizing open-ended research and narrative accounts.

For example, each teacher in the program takes 15 minutes each day to record the highs and lows of that day's activities. Using tape recorders, teachers are able to create a running informal account of the program.

Keeping a log of the discoveries is important; after all, the Apple Classroom of Tomorrow project is a voyage into an unexplored area. As Faye Wilmore says, "We're in territory where no one has been before."■

Peter Jordan is a professor of English at Tennessee State University. His articles have appeared in several business and computer publications. Write to him at 231 Second Avenue South, Franklin, TN 37064.

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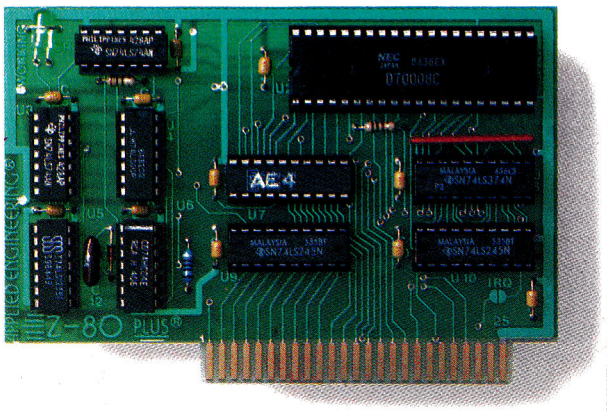

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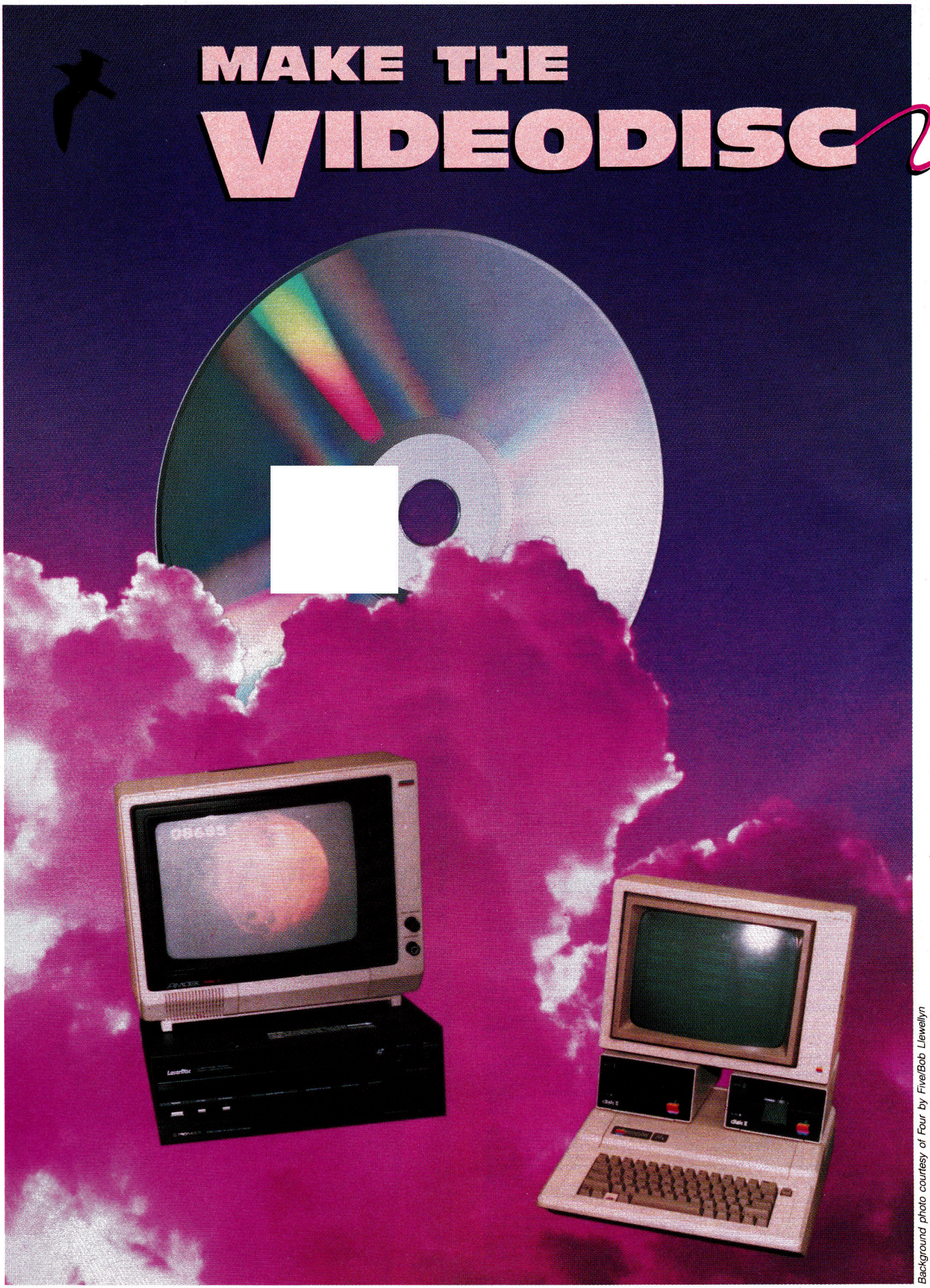
Circle 128 on Reader Service Card.

MAKE THE VIDEODISC



Background photo courtesy of Four by Five/Bob Llewellyn

CONNECTION

Educators are discovering the power of laserdisc technology: interactive video for more effective classroom teaching and the distribution of information.

by LeRoy J. Tuscher and Donald Kline

At a recent convention for science teachers, one of the booths seemed to be getting an unusual amount of attention. A sales representative held up a silver record and said, "This is a videodisc, and here is what you can do with it." He then described how teachers could use the videodisc, along with a computer, to present an "interactive video" lesson.

For those unfamiliar with the technology, a *videodisc*, or *laserdisc*, is a fixed storage medium that can archive video images: Still frames or motion sequences, sound from one or two audio tracks, and digitally encoded data can be stored and manipulated by a microprocessor.

A *videodisc player* controls and presents information on disc. These machines offer the capabilities of a videotape player and more. Since the information is read by laser light and the player head never touches the disc, images maintain their original quality indefinitely. The videodisc player also features rapid image- and data-access speed.

The idea of storing information—sound, video, text, or numeric data—on a laserdisc has been around for a long time. Thanks to compact audio discs, videodiscs, and CD-ROMs, the cost of this technology is now within reach of the average consumer. As a result, the potential of laser-technology applications in the areas of education, advertising, corporate training, information distribution, and entertainment is beginning to be realized.

A 12-inch videodisc can store up to 54,000 still frames of pictures and text or 30 minutes of motion video on each side. Each frame or motion sequence can be accessed *randomly* (as opposed to the operation of a videocassette recorder, which accesses its contents sequentially), with a maximum access time of about three seconds. When you connect a videodisc player to a microcomputer, this "interactive video workstation" becomes a powerful tool for distribution of information. Imagine browsing through a major department store's mail-order catalogue on videodisc: When you decide what you want to purchase, you touch the image of the item on the monitor screen, and the computer prompts you for the information it needs to complete the order.

In education and training, instructors are starting to take advantage of the power of laser technology. Researchers are finding that interactive video is particularly effective for teaching procedure. For instance, the U.S. military reports substantial savings in the number of man-hours required to teach certain skills when interactive-video technology is combined with traditional classroom training. As we begin to understand how interactive video fits into the learning process and begins to make its way into high-school and college classrooms, we can expect to see a long-hoped-for improvement in the quality of our educational system.

As are many new hardware technologies, interactive video is caught in a Catch-22. People will buy more laserdiscs as their variety and diversity increase—but selection of discs will increase only when developers see higher sales volumes of disc players: a larger market. One way

to break this cycle is to provide tools for making laserdiscs more functional.

A BASIC WORKSTATION

Two of the drawbacks of interactive video are the high cost of equipment and the sophisticated programming needed to access video images. A simpler method of access and an easy-to-learn language, though, would let more people put interactive video to practical use. An interactive video workstation designed around an enhanced Apple IIe and Applesoft BASIC meets these requirements. You control the videodisc player through the Applesoft ampersand (&) hook, which in turn sends control of the program to two machine-language routines (**Listings 1** and **2**) that communicate with the videodisc player.

The workstation consists of an enhanced Apple IIe with Super Serial Card, 80-column card, and optional AppleMouse; a Pioneer LD-V6000 intelligent videodisc player; a monochrome or color monitor for computer output; and a color monitor capable of accepting video and sound input from the videodisc player. Install the Super Serial Card in slot 2 of your Apple and configure it for communication mode. A baud rate of 4800 bits per second or higher (9600 is recommended) is necessary to establish communication with the player.

To configure the videodisc player, simply connect it to your Apple with a standard RS-232C cable and match their baud rates, data formats, and parity settings. See the **Table** and **Figure** for serial-card and disc-player DIP-switch settings; communications parameters are 9600 baud, 7 data bits, 1 stop bit, and no parity.

Connect one monitor to your Apple and the second to the videodisc player, according to the standard procedures described in their respective owner's manuals. Note that the videodisc monitor must be capable of delivering at least monaural sound. With monaural monitors, you'll need an audio Y connector to link the two audio channels from the player.

One of the quirks of the workstation is that you must turn on your Apple before the videodisc player. If you start the computer after the player, the two machines don't "handshake" (exchange signals to determine readiness). Once the link is established, the system behaves like any other computer/peripheral hookup.

THE ASSEMBLY-LANGUAGE INTERFACE

At the heart of the interactive video workstation is a set of two machine-language modules (**Listings 1** and **2**; data strips containing these listings are found on p. 112 in this issue). Accessed through the Applesoft BASIC ampersand (&) hook, these routines let you control videodisc images from within a BASIC program or, in Applesoft's immediate programming mode, from the keyboard or mouse.

Listing 1. Videodisc Controller.

```
9400- 98 A5 D7 69 C0 8D 15 94  94D0- 4C EB 94 A9 FE 4C EB 94
9408- 8D 50 95 18 A5 D7 69 B0  94D8- A9 1C 4C EB 94 A9 1B 4C
9410- 8D 58 94 AD 0C C0 C9 31  94E0- EB 94 4C 7C 95 4C 7C 95
9418- D0 0B A9 5B 8D F6 03 A9  94E8- 4C 36 95 48 20 41 95 68
9420- 94 8D F7 03 60 A0 00 B9  94F0- 20 ED FD 4C 72 95 48 20
9428- 33 94 F0 06 20 ED FD C8  94F8- 41 95 A2 05 20 B1 00 F0
9430- D0 F5 60 8D D3 F5 F0 E5  9500- 0F B0 18 38 E9 30 A8 B9
9438- F2 A0 D3 E5 F2 E9 E1 EC  9508- 8C 95 20 ED FD CA D0 EC
9440- A0 C3 E1 F2 E4 A0 EE EF  9510- E0 05 B0 07 68 20 ED FD
9448- F4 A0 E6 EF F5 EE E4 A0  9518- 4C 21 95 68 A9 BF 20 ED
9450- E9 EE A0 D3 EC EF F4 A0  9520- FD 4C 72 95 48 20 41 95
9458- 00 8D 00 C9 41 F0 3D C9  9528- 68 48 20 ED FD 20 E8 94
9460- 42 F0 3E C9 43 F0 3F C9  9530- 90 F6 68 4C 72 95 18 AD
9468- 44 F0 40 C9 45 F0 41 C9  9538- 00 C0 10 04 8D 10 C0 38
9470- 46 F0 42 C9 47 F0 43 C9  9540- 60 A5 36 8D 96 95 A5 37
9478- 48 F0 44 C9 49 F0 45 C9  9548- 8D 97 95 A9 00 85 36 A9
9480- 4A F0 46 C9 4B F0 47 C9  9550- C0 85 37 A9 81 20 ED FD
9488- 4C F0 48 C9 4D F0 49 C9  9558- A9 C5 20 ED FD A9 A0 20
9490- 4E F0 4A C9 52 F0 4B C9  9560- ED FD A9 C4 20 ED FD A9
9498- BA F0 4A 60 A9 F4 4C EB  9568- 8D 20 ED FD A9 3D 20 ED
94A0- 94 A9 FC 4C EB 94 A9 F3  9570- FD 60 AD 96 95 85 36 AD
94A8- 4C F6 94 A9 F1 4C EB 94  9578- 97 95 85 37 A0 00 B1 B8
94B0- A9 FB 4C EB 94 A9 FD 4C  9580- F0 09 C9 3A F0 05 20 B1
94B8- EB 94 A9 F9 4C EB 94 A9  9588- 00 D0 FB 60 3F 0F 8F 4F
94C0- F0 4C 24 95 A9 F8 4C 24  9590- 2F AF 6F 1F 9F 5F A0 A0
94C8- 95 A9 F7 4C F6 94 A9 F6  9598- 20
```

The Videodisc Controller (VC) assembly routine (see **Listing 1**) is responsible for actual communication with the videodisc player and thus must be in memory whenever you run the videodisc player. Use the Videodisc-Mouse Interface (VMI) assembly routine (**Listing 2**) while you're programming an interactive video presentation. VMI gives you access to disc images for preview and selection. Use it only in immediate mode; it doesn't have to be in memory during the presentation.

The interface modules operate with either ProDOS or DOS 3.3. Since the two operating systems treat memory management differently, though, you must be sure to use the proper routine to load the modules into memory. **Listings 3** (DOS 3.3) and **4** (ProDOS) are BASIC subroutines that load and initialize VMI and VC. Delete lines 1080 and 1090 in **Listing 3** or lines 1090–1110 in **Listing 4** to load and initialize only VC.

VIDEODISC CONTROL

The VC module (**Listing 1**) carries out the actual communication tasks between your Apple and the videodisc

Table. DIP-switch settings for communication between Super Serial Card and Pioneer intelligent videodisc player.

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW10
SSC-1	OFF	OFF	OFF	ON	either	either	either	The Super Serial Card has two banks of seven switches each; the Pioneer LD-V6000 player has ten switches.		
SSC-2	ON	OFF	either	ON	either	either	either			
LD-V6000	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF

player. You access VC from within an Applesoft BASIC program through the ampersand hook. When the BASIC interpreter reads the ampersand character, it executes a jump to memory location $3F5, which in turn executes a jump to the routine beginning at the address stored in locations $3F6 and $3F7. The initializing routine that loads the VC module into memory (**Listing 3** or **4**) also POKEs the necessary address values into these locations.

When program control is passed to VC, the module compares the character immediately following the ampersand to a list of valid command characters. If the character is a valid command, VC sets the character-output switch (CWS) at locations $36 and $37 to slot 2, converts the command to the format required by the videodisc player, outputs the command, and resets the CWS to return output to the Apple's screen.

The LD-V6000 player can accept external input in either ASCII-hex or binary-hex format, but uses nonstandard hex values for commands. The module's command-conversion routines tell the videodisc player which hex format to accept (we chose binary-hex), then checks to see whether the command requires frame-number input. If it does, the

Listing 2. Videodisc-Mouse Interface.

```
8A00- 20 16 8A 20 E0 8A 20 02
8A08- 8D 20 86 8D 20 A0 8F 20
8A10- A5 8D 20 4B 8F 60 18 A5
8A18- D7 69 C0 8D 3B 8A 18 A5
8A20- D7 69 B0 8D B3 8A AD B3
8A28- FB C9 06 D0 1B AD C0 FB
8A30- C9 E0 D0 14 AD 17 C0 30
8A38- 0F AD 0C C0 C9 31 D0 08
8A40- AD 00 94 C9 18 D0 01 60
8A48- A9 5A 85 FC A9 8A 85 FD
8A50- A2 02 A4 25 20 EC 8C 68
8A58- 68 60 8D D9 EF F5 A0 EE
8A60- E5 E5 E4 A0 E1 EE A0 C5
8A68- EE E8 E1 EE E3 E5 E4 A0
8A70- C1 F0 F0 EC E5 A0 AF AF
8A78- E5 A0 F7 E9 F4 E8 A0 E1
8A80- EE 8D B8 B0 AD E3 EF EC
8A88- F5 ED EE A0 F4 E5 F8 F4
8A90- A0 E3 E1 F2 E4 AC A0 E1
8A98- A0 D3 F5 F0 E5 F2 A0 D3
8AA0- E5 F2 E9 E1 EC 8D C3 E1
8AA8- F2 E4 A0 E9 EE A0 D3 EC
8AB0- EF F4 A0 00 AC A0 E1 EE
8AB8- E4 A0 F4 E8 E5 A0 F0 F2
8AC0- EF E7 F2 E1 ED A0 A7 D6
8AC8- C3 A7 8D C2 CC CF C1 C4
8AD0- E5 E4 A0 E9 EE F4 EF A0
8AD8- ED E5 ED EF F2 F9 8D 00
8AE0- 20 39 FB 20 00 C3 20 58
8AE8- FC 20 F0 8A 20 1A 8B 60
8AF0- A9 00 85 FC A9 8B 85 FD
8AF8- A2 1B A0 00 20 EC 8C 60
8B00- D6 E9 E4 E5 EF E4 E9 F3
8B08- E3 A0 CD EF F5 F3 E5 A0
8B10- C9 EE F4 E5 F2 E6 E1 E3
8B18- E5 00 A9 05 85 CE A9 02
8B20- 85 08 A9 03 85 CF A9 01
8B28- 85 06 20 47 8B 20 C7 8B
8B30- 18 A5 06 69 1C 85 06 C6
8B38- CF D0 EF 18 A5 08 69 03
8B40- 85 08 C6 CE D0 DC 60 A9
8B48- 78 85 FC A9 8B 85 FD A6
8B50- 06 A4 08 20 EC 8C A9 8E
8B58- 85 FC A9 8B 85 FD A6 06
8B60- A4 08 C8 20 EC 8C A9 AD
8B68- 85 FC A9 8B 85 FD A6 06
8B70- A4 08 C8 C8 20 EC 8C 60
8B78- A0 DF DF DF DF DF DF DF
8B80- DF DF DF DF DF DF DF DF
8B88- DF DF DF DF DF 00 9B 8F
8B90- DA 9B 8E A0 A0 A0 A0 A0
8B98- A0 A0 A0 A0 A0 A0 A0 A0
8BA0- A0 A0 A0 A0 A0 A0 A0 9B
8BA8- 8F DF 9B 8E 00 A0 9B 8F
8BB0- CC CC CC CC CC CC CC CC
8BB8- CC CC CC CC CC CC CC CC
8BC0- CC CC CC CC 9B 8E 00 38
8BC8- A5 25 E5 CF E9 01 85 1D
8BD0- 0A 0A 0A 0A 18 65 1D 69
8BD8- ED 85 FC A9 8B 69 00 85
8BE0- FD A6 06 E8 E8 E8 A4 08
8BE8- C8 20 EC 8C 60 C1 F5 E4
8BF0- E9 EF A0 B1 AF CC A0 A0
8BF8- A0 A0 A0 A6 C1 00 C1 F5
8C00- E4 E9 EF A0 B2 AF D2 A0
8C08- A0 A0 A0 A0 A6 C2 00 C1
8C10- F5 F4 EF A0 D3 F4 EF F0
8C18- A0 A3 A0 A0 A0 A6 C3 00
8C20- C4 E9 F3 F0 EC E1 F9 A0
8C28- A0 A0 A0 A0 A0 A0 A6 C4
8C30- 00 C6 F2 E5 E5 FA E5 A0
8C38- C6 F2 E1 ED E5 A0 A0 A6
8C40- C5 00 D0 EC E1 F9 A0 A0
8C48- A0 A0 A0 A0 A0 A0 A0 A0
8C50- A6 C6 00 D2 E5 EA E5 E3
8C58- F4 A0 A0 A0 A0 A0 A0 A0
8C60- A0 A6 C7 00 D3 E3 E1 EE
8C68- A0 C6 EF F2 F7 E1 F2 E4
8C70- A0 A0 A6 C8 00 D3 E3 E1
8C78- EE A0 D2 E5 F6 E5 F2 F3
8C80- E5 A0 A0 A6 C9 00 D3 E5
8C88- E1 F2 E3 E8 A0 A3 A0 A0
8C90- A0 A0 A0 A0 A6 CA 00 D3
8C98- F4 E5 F0 A0 C6 EF F2 F7
8CA0- E1 F2 E4 A0 A0 A6 CB 00
8CA8- D3 F4 E5 F0 A0 D2 E5 F6
8CB0- E5 F2 F3 E5 A0 A0 A6 CC
8CB8- 00 D6 E9 E4 E5 EF A0 CF
8CC0- E6 E6 A0 A0 A0 A0 A0 A6
8CC8- CD 00 D6 E9 E4 E5 EF A0
8CD0- CF EE A0 A0 A0 A0 A0 A0
8CD8- A6 CE 00 C1 F0 F0 EC E5
8CE0- F3 EF E6 F4 A0 A0 C2 E1
8CE8- F3 E9 E3 00 48 86 24 84
8CF0- 25 20 22 FC A0 00 B1 FC
8CF8- F0 06 20 ED FD C8 D0 F6
8D00- 68 60 20 0C 8D 20 2E 8D
8D08- 20 4E 8D 60 A2 07 A9 00
8D10- 85 FC A9 C7 85 FD A0 0C
8D18- B1 FC C9 20 D0 08 A0 FB
8D20- B1 FC C9 D6 F0 05 C6 FD
8D28- CA D0 EB 86 09 60 A5 09
8D30- F0 1B 09 C0 85 1E 8D 01
8D38- 91 A5 09 0A 0A 0A 85
8D40- 1F A0 19 20 FE 90 A0 12
8D48- A9 01 20 FE 90 60 A5 09
8D50- F0 FB A2 C0 A9 00 9D B8
8D58- 03 9D B8 04 A9 3F 9D 38
8D60- 04 A9 01 9D 38 05 A0 17
8D68- A9 00 20 FE 90 A2 C0 A9
8D70- 00 9D 38 05 A9 BF 9D 38
8D78- 04 A0 17 A9 01 20 FE 90
8D80- A0 15 20 FE 90 60 A9 00
8D88- 8D E3 94 A9 8A 8D E4 94
8D90- A9 A5 8D E6 94 A9 8D 8D
8D98- E7 94 A9 80 8D E9 94 A9
8DA0- 8F 8D EA 94 60 20 58 FC
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8DB8- D0 02 E6 FD A8 A2 02 20
8DC0- EC 8C 18 A5 FC 69 27 85
8DC8- FC A5 FD 69 00 85 FD 4C
8DD0- B0 8D A0 00 B1 B8 F0 09
8DD8- C9 3A F0 05 20 B1 00 D0
8DE0- FB 60 02 D6 E9 E4 E5 EF
8DE8- E4 E9 F3 E3 A0 C3 EF ED
8DF0- ED E1 EE E4 F3 BA A0 A0
8DF8- A0 A0 A0 A0 A0 A0 A0 A0
8E00- A0 A0 A0 A0 A0 A0 A0 A0
8E08- A0 00 04 A6 C1 A0 AD A0
8E10- C1 F5 E4 E9 EF A0 B1 AF
8E18- CC A0 A0 A0 A0 A0 A0 A0
8E20- A6 C8 A0 AD A0 D3 E3 E1
8E28- EE A0 C6 EF F2 F7 E1 F2
8E30- E4 00 05 A6 C2 A0 AD A0
8E38- C1 F5 E4 E9 EF A0 B2 AF
8E40- D2 A0 A0 A0 A0 A0 A0 A0
8E48- A6 C9 A0 AD A0 D3 E3 E1
8E50- EE A0 D2 E5 F6 E5 F2 F3
8E58- E5 00 06 A6 C3 A0 AD A0
8E60- C1 F5 F4 EF A0 D3 F4 EF
8E68- F0 A0 A3 A0 A0 A0 A0 A0
8E70- A6 CA A0 AD A0 D3 E5 E1
8E78- F2 E3 E8 A0 A3 A0 A0 A0
8E80- A0 00 07 A6 C4 A0 AD A0
8E88- C4 E9 F3 F0 EC E1 F9 A0
8E90- A0 A0 A0 A0 A0 A0 A0 A0
8E98- A6 CB A0 AD A0 D3 F4 E5
8EA0- F0 A0 C6 EF F2 F7 E1 F2
8EA8- E4 00 08 A6 C5 A0 AD A0
8EB0- C6 F2 E5 E5 FA E5 A0 C6
8EB8- F2 E1 ED E5 A0 A0 A0 A0
8EC0- A6 CC A0 AD A0 D3 F4 E5
8EC8- F0 A0 D2 E5 F6 E5 F2 F3
8ED0- E5 00 09 A6 C6 A0 AD A0
8ED8- D0 EC E1 F9 A0 A0 A0 A0
8EE0- A0 A0 A0 A0 A0 A0 A0 A0
8EE8- A6 CD A0 AD A0 D6 E9 E4
8EF0- E5 EF A0 CF E6 E6 A0 A0
8EF8- A0 00 0A A6 C7 A0 AD A0
8F00- D2 E5 EA E5 E3 F4 A0 A0
8F08- A0 A0 A0 A0 A0 A0 A0 A0
8F10- A6 CE A0 AD A0 D6 E9 E4
8F18- E5 EF A0 CF EE A0 A0 A0
8F20- A0 00 0C D4 F9 F0 E5 A0
8F28- A6 D2 A0 F4 EF A0 F2 E5
8F30- E1 E3 F4 E9 F6 E1 F4 E5
8F38- A0 F4 E8 E5 A0 ED EF F5
8F40- F3 E5 A0 A0 A0 A0 A0 A0
8F48- 8D 00 00 A9 5B 85 FC A9
8F50- 8F 85 FD A0 0D A2 02 20
8F58- EC 8C 60 D4 F9 F0 E5 A0
8F60- A6 BF A0 F4 EF A0 E4 E9
8F68- F3 F0 EC E1 F9 A0 F4 E8
8F70- E9 F3 A0 E8 E5 EC F0 A0
8F78- F3 E3 F2 E5 E5 EE 8D 00
8F80- AD 00 C0 30 14 A5 09 F0
8F88- 15 A0 14 20 FE 90 A6 1E
8F90- BD B8 06 29 C0 C9 40 D0
8F98- 05 8D 10 C0 38 60 18 60
8FA0- 20 AC 8F 20 C4 8F 20 1A
8FA8- 92 90 F8 60 A9 00 85 06
8FB0- 85 08 20 C1 FB 20 E3 90
8FB8- 20 BB 90 A9 00 85 1A 85
8FC0- 19 85 1B 60 A5 09 F0 0E
8FC8- A0 14 20 FE 90 A6 1E BD
8FD0- B8 06 29 20 D0 25 AD 00
8FD8- C0 30 3D A5 09 F0 F7 A6
8FE0- 1E BD B8 06 29 80 D0 05
8FE8- A5 1B F0 DC 60 A5 19 F0
8FF0- D7 A5 1B D0 D3 20 32 91
8FF8- 4C C8 8F 20 76 90 20 BB
9000- 90 20 10 91 A5 19 C5 1A
9008- F0 BA A5 19 D0 CD A5 1B
9010- F0 B2 20 57 91 4C C4 8F
9018- 29 7F 8D 10 C0 C9 08 F0
9020- 18 C9 15 F0 1D C9 0B F0
9028- 24 C9 0A F0 29 C9 0D D0
9030- 93 A5 19 F0 8F 20 32 91
9038- 60 A5 06 F0 D8 C6 06 4C
9040- 5E 90 A5 06 C9 4F F0 CD
9048- E6 06 4C 5E 90 A5 08 F0
9050- C4 C6 08 4C 5E 90 A5 08
9058- C9 17 F0 B9 E6 08 A5 08
9060- 20 C1 FB 20 BB 90 20 10
9068- 91 A5 09 D0 03 4C D6 8F
9070- 20 95 90 4C 04 90 A6 1E
9078- BD 38 04 4A 4A 4A 85 08
9080- 20 C1 FB 5E B8 04 7E B8
9088- 03 5E B8 04 7E B8 03 BD
9090- B8 03 85 06 60 A6 1E A5
9098- 08 0A 0A 0A 9D 38 04 A9
90A0- 00 9D B8 04 A5 06 9D B8
90A8- 03 1E B8 03 3E B8 04 1E
90B0- B8 03 3E B8 04 A0 16 20
90B8- FE 90 60 20 D2 90 20 E3
90C0- 90 A5 06 4A B0 03 8D 55
90C8- C0 A8 A9 42 91 28 8D 54
90D0- C0 60 A5 07 4A B0 03 8D
90D8- 55 C0 A8 A5 1D 91 FE 8D
90E0- 54 C0 60 A5 28 85 FE A5
90E8- 29 85 FF A5 06 85 07 4A
90F0- B0 03 8D 55 C0 A8 B1 28
90F8- 8D 54 C0 85 1D 60 48 B9
9100- 00 C4 A6 1E A4 1F 8D 0E
9108- 91 8E 0F 91 68 4C 00 00
9110- A5 19 85 1A A4 08 B9 AF
9118- 91 10 12 29 7F 85 19 A4
9120- 06 B9 C7 91 10 07 29 7F
9128- 18 65 19 D0 02 A9 00 85
9130- 19 60 A9 95 8D 88 91 A9
9138- 91 8D 89 91 A5 28 85 EB
9140- A5 29 85 EC A5 06 85 E3
9148- 20 69 91 A5 1D 20 95 91
9150- 85 1D A9 01 85 1B 60 A9
9158- A4 8D 88 91 A9 91 8D 89
9160- 91 20 69 91 A9 00 85 1B
9168- 60 A4 E3 B9 C7 91 29 7F
9170- A8 B9 17 92 85 ED A2 14
9178- A5 ED 4A B0 03 8D 55 C0
9180- A8 B1 EB C9 42 F0 05 20
9188- 00 00 91 EB 8D 54 C0 E6
9190- ED CA D0 E4 60 C9 C0 90
9198- 08 C9 E0 B0 04 29 3F B0
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91A8- 09 80 B0 02 09 C0 60 00
91B0- 00 00 81 00 00 84 00 00
91B8- 87 00 00 8A 00 00 8D 00
91C0- 00 00 00 00 00 00 00 00
91C8- 00 80 80 80 80 80 80 80
91D0- 80 80 80 80 80 80 80 80
91D8- 80 80 80 80 80 00 00 00
91E0- 00 00 00 00 00 81 81 81
91E8- 81 81 81 81 81 81 81 81
91F0- 81 81 81 81 81 81 81 81
91F8- 81 00 00 00 00 00 00 00
9200- 00 82 82 82 82 82 82 82
9208- 82 82 82 82 82 82 82 82
9210- 82 82 82 82 82 00 00 02
9218- 1E 3A 20 A3 92 A5 19 C9
9220- 0F F0 33 C9 03 F0 04 C9
9228- 0A D0 0A 48 20 58 92 A5
9230- 08 20 C1 FB 68 18 69 40
9238- 20 5B 94 A9 80 20 A8 FC
9240- 20 57 91 A5 1D 20 A4 91
9248- 85 1D A5 09 F0 03 20 95
9250- 90 20 B7 92 18 60 38 60
9258- A9 12 85 22 A9 8D 85 FC
9260- A9 92 85 FD A2 02 A0 13
9268- 20 EC 8C 20 2C D5 A9 A2
9270- 85 FC A9 92 85 FD A2 02
9278- A0 13 20 EC 8C 20 42 FC
9280- A9 FF 85 B8 A9 01 85 B9
9288- A9 00 85 22 60 C5 EE F4
9290- E5 F2 A0 C6 F2 E1 ED E5
9298- A0 CE F5 ED E2 E5 F2 BA
92A0- A0 A0 00 A5 B8 85 FA A5
92A8- B9 85 FB A2 00 BD 00 02
92B0- 9D CB 92 E8 D0 F7 60 A5
92B8- FA 85 B8 A5 FB 85 B9 A2
92C0- 00 BD CB 92 9D 00 02 E8
92C8- D0 F7 60 00 00 00 00 00
92D0- 00 00 00 00 00 00 00 00
92D8- 00 00 00 00 00 00 00 00
92E0- 00 00 00 00 00 00 00 00
92E8- 00 00 00 00 00 00 00 00
92F0- 00 00 00 00 00 00 00 00
92F8- 00 00 00 00 00 00 00 B0
9300- FF A0 A0 FF FF FF FF FF
9308- FF FF FF FF FF FF FF FF
9310- FF FF FF FF FF FF FF FF
9318- FF FF FF FF FF FF FF FF
9320- FF FF FF FF FF FF FF FF
9328- FF FF FF FF FF FF FF FF
9330- FF FF FF FF FF FF FF FF
9338- FF FF FF FF FF FF FF FF
9340- FF FF FF FF FF FF FF FF
9348- FF FF FF FF FF FF FF FF
9350- FF FF FF FF FF FF FF FF
9358- FF FF FF FF FF FF FF FF
9360- FF FF FF FF FF FF FF FF
9368- FF FF FF FF FF FF FF FF
9370- FF FF FF FF FF FF FF FF
9378- FF FF FF FF FF FF FF FF
9380- FF FF FF FF FF FF FF FF
9388- FF FF FF FF FF FF FF FF
9390- FF FF FF FF FF FF FF FF
9398- FF FF FF FF FF FF FF FF
93A0- FF FF FF FF FF FF FF FF
93A8- FF FF FF FF FF FF FF FF
93B0- FF FF FF FF FF FF FF FF
93B8- FF FF FF FF FF FF FF FF
93C0- FF FF FF FF FF FF FF FF
93C8- FF FF FF 00
```

conversion routines use a look-up table to convert frame numbers to hex values the player understands.

THE MOUSE INTERFACE

When developing interactive video presentations, you may want to access your material to verify start and stop frames in a motion sequence, check audio information, or simply search for an appropriate still frame or motion sequence. The Videodisc-Mouse Interface (VMI) module (**Listing 2**) accomplishes this task. VMI gives you a "mouse keypad" for controlling the videodisc player; it lets you use the AppleMouse or the keyboard's arrow keys and return key to "press" the buttons on the keypad.

VMI serves two functions. When you're assigning a particular purpose to a generic videodisc (one that was originally designed for a variety of presentations), VMI lets you determine the disc's content. Some developers of generic discs provide a printed index, but you'll still need to check images to verify their usefulness for your intended audience.

Secondly, you may want to check image, sound-track, or motion-sequence start and stop frame numbers while writing program code. Since the modules reside in a protected area of memory, outside the memory space BASIC uses, you can access the disc without disturbing the BASIC code.

One of the options on the mouse keypad is Applesoft

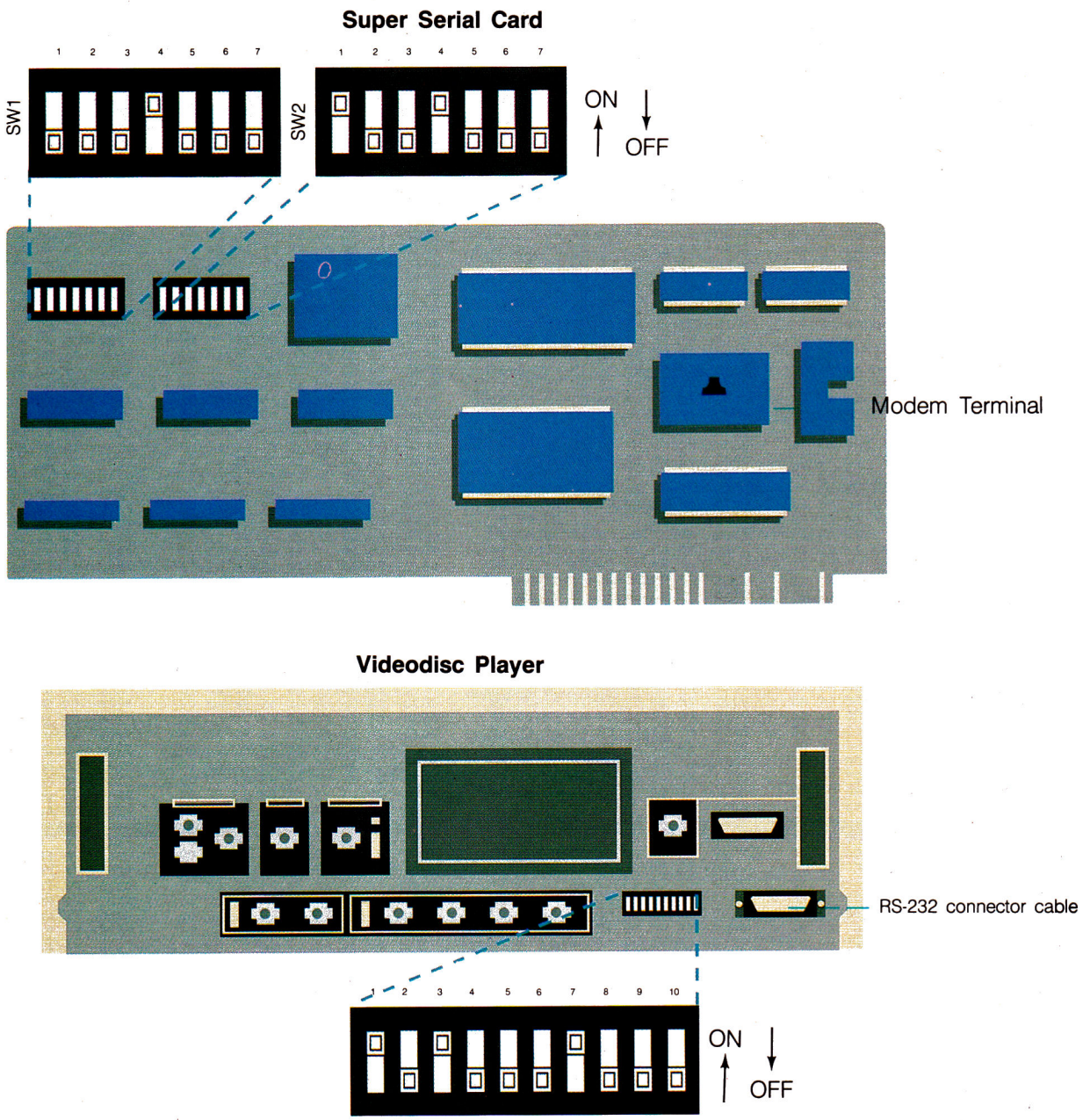

Figure. *Diagram showing positions of DIP switches in Apple Super Serial Card (above) and Pioneer videodisc player (below) to enable communication.*

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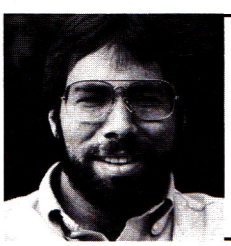

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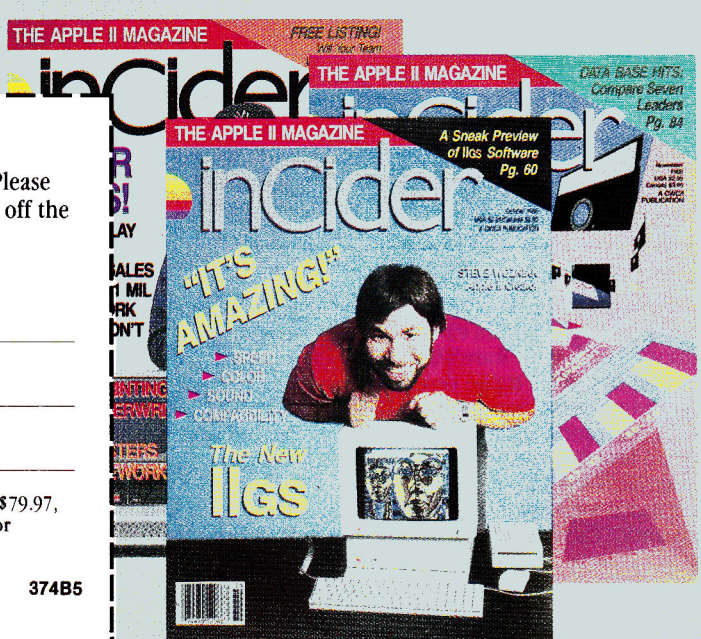

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Listing 3. BASIC routine to load Videodisc Controller and Videodisc-Mouse Interface under DOS 3.3.

```
1000  REM ** Load and Initialize VC and VMI Modules **
1010  :
1020  POKE 115,0: POKE 116, 139: REM  Set HIMEM = 35584
1030  D$ = CHR$ (4): REM  CHR$ (4) is Control-D
1040  PRINT D$;"PR#3": REM  Turn on 80-column card
1050  PRINT D$;"BLOAD VC,A$9400"
1060  POKE 215,2: REM  Set Super Serial Card slot 2
1070  CALL 37888: REM  Set Ampersand hook
1080  PRINT D$;"BLOAD VMI,A$8A00"
1090  CALL 35328: REM Start Videodisc Mouse Interface
1100  RETURN
```

Listing 4. BASIC routine to load Videodisc Controller and Videodisc-Mouse Interface under ProDOS.

```
1000  REM  ** Load and Initialize VC and VMI Modules **
1010  :
1020  D$ = CHR$ (4): REM  CHR$ (4) is Control-D
1030  DEF FN LO(X) = X - INT (X / 256) * 256: DEF FN
      HI(X) = INT (X / 256)
1040  POKE 58,245: POKE 59,190: POKE 69,16: CALL -327:
      POKE 49003,255: POKE 49002,255: POKE 49001,63: REM
      Protect 16 pages of memory starting at $8A00
1050  PRINT D$;"BLOAD VC,A$4000"
1060  FIRST = 16384: LAST = 16383 + 2 * 256: DEST =
      37888: GOSUB 2000: REM  Move to $9400
1070  POKE 215,2: REM  Set Super Serial Card to Slot 2
1080  CALL 37888:  REM  Set Ampersand Hook
1090  PRINT D$;"BLOAD VMI,A$4000"
1100  FIRST = 16384: LAST = 16383 + 9 * 256: DEST =35328:
      GOSUB 2000: REM  Move to $8A00
1110  CALL 35328: REM  Start Videodisc Mouse Interface
      routines
1120 RETURN
1130 :
1140 :
2000  REM  ** Memory Move **
2010 :
2020  POKE 60, FN LO(FIRST): POKE 61, FN HI(FIRST)
2020  POKE 62, FN LO(LAST): POKE 63, FN HI(LAST)
2040  POKE 66, FN LO(DEST): POKE 67, FN HI(DEST)
2050  POKE 58,44: POKE 59,254: POKE 71,0: CALL  - 327
2060  RETURN
```

BASIC. Pressing this button deactivates VMI and puts you into Applesoft BASIC. If you want to use the keypad while writing code, type &R without a line number to reactivate VMI and display the keypad.

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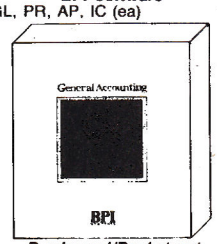

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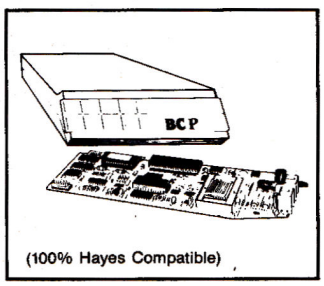

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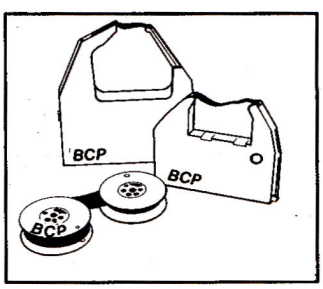

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Merging Letter and Spreadsheet

Combine your AppleWorks spreadsheet with a letter to create a convincing proposal.

by Ruth K. Witkin

When last we met, we were avidly following the exploits of David Clark, soon-to-be college graduate, budding psychologist, and doomed to shank's mare unless he can come up with an affordable (for him) car deal and some pretty persuasive arguments (for his parents) to pitch in with the down payment. Last month, David created a car-loan spreadsheet that let him compare one car deal with another. He's finally come up with two good (but fictional) possibilities—the Olds Sonesta and the Chevrolet Madrigal.

In this episode, David merges his car-loan spreadsheet into a letter asking Mom and Dad to help with the down payment. In the course of this task, David suppresses the spreadsheet header, resolves wraparound problems in the letter, changes character size, previews the page breaks, creates a page header, and prints the new document, which is shown in the **Figure**. Merging diverse files is simple with AppleWorks, and produces a document that's truly greater than the sum of the parts. Each file complements the other, clarifies the comments expressed in the letter, and lays the groundwork for a fruitful discussion.

If you haven't created the spreadsheet yet (see the March 1987 AppleWorks in Action, p. 76), now is a good time to do it. If you don't have those instructions handy, mock up a spreadsheet to look like the one in the **Figure**, so that you have a chance to practice cut-and-paste.

CREATING THE LETTER

Use the AppleWorks Startup and Program disks to bring up a new word-processor screen. Name this file CARLOANLTR. You should now see the Review/Add/Change screen. The cursor is in line 1 column 1, which is where your first typed character will appear.

First enter the text of the letter you see in the **Figure**. To be sure your results match the **Figure**, press the spacebar only *once* between sentences. If you make a typo, press the delete key to back up the cursor and erase the character. Press OA-Z to see the rectangular figures, called blots, that show your carriage returns.

Before typing the date, press the tab key nine times. Press the return key five times after the date, then type the salutation. Press Return twice to skip a line and move the cursor to line 8.

Press the tab key to indent each paragraph of the letter, and press Return twice at the end of each paragraph. At line 40, after the body of your letter, press Tab nine times to type the closing. (You'll soon fix the wraparound you see now.) Press Return five times to move the cursor to line 46. Press Tab nine times and type **David**. Leave your cursor in line 46 column 51.

This is a good time to store the document on disk: Press OA-S and relax while AppleWorks "carefully" saves your file.

LOADING THE SPREADSHEET

Now bring CARLOAN, the spreadsheet file, to the Desktop. First, press the escape key to return to the Main Menu. The data disk containing the car-loan spreadsheet should now be in the current drive. At the Main Menu, press the return key to confirm *Add files to the Desktop.* At the Add Files menu, press the return key to confirm *The current disk.* At the AppleWorks files menu, place the highlight on CARLOAN and press the return key.

And here's the car-loan spreadsheet. A filename and date aren't needed in the letter, so have AppleWorks keep the header from printing: Press OA-O to bring up the Printer Options screen. Type **PH** and press the return key to toggle the header setting to *No.* Press the escape key to exit the Printer Options screen.

PRINTING THE SPREADSHEET TO THE CLIPBOARD

Before you can paste the spreadsheet into the letter, you must print it to the clipboard: Press OA-P to bring up the Print screen. Press the return key to confirm *All.* Type **2** (or the number that selects *The clipboard*) and press the return key again. AppleWorks now confirms that the

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Figure. Car-loan spreadsheet cut-and-pasted into a letter.

April 3, 1987

Dear Mom and Dad:

How are things at home? Everything is going well at this end. Mid-terms are over, and graduation is just around the corner. Have you made the reservations yet? I hear most of the flights are getting booked fast. Bitsy says she can't wait to meet you, and I'm looking forward to seeing her folks again. They're nice people.

Speaking of graduation, I've been thinking about what we talked about at Christmas. Instead of that trip to California, I've decided I'd really rather have a car. I know it's a big responsibility but, with real life descending upon me at a fast clip, this is a good time to take on the responsibility.

I've shopped around a lot (in between studying and exams), and it looks like the Olds Sonesta and the Chevy Madrigal are my best bets. They're small, economical, and fuel efficient. I've worked out the costs on an AppleWorks spreadsheet. Here's what it looks like:

CAR LOAN CALCULATOR

	Sonesta (1)	Madrigal (2)	Diff (2-1)
Price of Car	9,844.00	12,553.00	2,709.00
Rustproofing	250.00	269.00	19.00
Sales Tax (8%)	807.52	1,025.76	218.24
Registration/Misc Fees	35.00	36.50	1.50
NYS Inspection	8.00	8.00	0.00
TOTAL COST	10,944.52	13,892.26	2,947.74
Deposit	50.00	50.00	0.00
Down Payment	1,500.00	1,500.00	0.00
AMOUNT FINANCED	9,394.52	12,342.26	2,947.74
Annual Interest Rate (%)	7.90	13.90	6.00
Term in Years	3	5	2
Term in Months	36	60	24
MONTHLY LOAN PAYMENT	293.96	286.54	(7.41)
Annual Loan Payment	3,527.48	3,438.52	(88.96)
Total Loan Payment	10,582.45	17,192.60	6,610.15
Total Interest Charge	1,187.93	4,850.34	3,662.41

Letter to Mom and Dad Page 2

I'm going to have to get around somehow, what with night classes and my job at the clinic, and I'm sure neither of you wants to shuttle me from place to place. The only problem is money. If you can only come up with a $1500 down payment, I'm sure I can swing the monthly payments, gas, and insurance. That's only a bit more than the trip would cost. Please consider it. We can talk more about it when I get home for spring break.

See you soon. Send my love to everyone.

Your loving son,

David

David

spreadsheet is indeed on the clipboard and can be moved or copied into a word-processor document. Press the return key or the spacebar. The spreadsheet returns to the screen.

MERGING THE SPREADSHEET AND LETTER

Now bring the letter on screen: Press OA-Q to switch to the Desktop Index. Move the highlight to CARLETTER and press the return key. And here's the letter.

Everything is set. Press OA-6 to jump the cursor to line 29 ("I'm going to have to get around somehow"). Press OA-M to bring up the Move Text screen. Type **F** to select *From clipboard (paste)*. Presto! AppleWorks instantly brings the spreadsheet from the clipboard and plunks it into the letter. Only one problem—that left margin is a hodgepodge. When a spreadsheet is too wide to fit into the print area of a document, the rightmost column wraps around to the left margin. Before you correct anything, press OA-S to store the integrated document on disk.

PRINTING THE DOCUMENT

It's a good idea to print a document before you format it, because it shows what you're working with and it's fun to compare afterward. Turn on your printer and press OA-P to bring up the Print Menu. Press the return key to confirm *Beginning*. Press the return key to confirm the printer (or type a printer number, then press Return), and press the return key again to confirm one copy. And here are two quite messy pages.

REDUCING THE CHARACTER SIZE

One way to correct the wraparound problem is to call for smaller characters. Press OA-1 to jump the cursor to line 1. Press OA-O to bring up the Printer Options screen. Type **CI** and press the return key. Type **12** and press the return key again. Press the escape key. Now press OA-5 to jump to the spreadsheet. Quite an improvement, but the spreadsheet is still a tad too wide (you can still see part of the right column at the left margin).

CHANGING THE MARGINS

Reducing the left margin will give the spreadsheet more room to spread out. Press OA-1 to jump the cursor to line 1 (atop the *Chars per Inch* indicator). Press OA-O to bring up the Printer Options screen. Type **LM** and press the return key. Type **.9** and

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press the return key again. Press the escape key. Press OA-5. That's more like it—the wraparound is gone and everything is just as it should be.

Next, position the document on the printed page: Press OA-1, then OA-O. A one-inch top margin is pleasing to the eye, so type **TM** and press the return key. Type **1** and press the return key again.

The size of the bottom margin isn't only a matter of aesthetics, but what you want to fit on a page. Trial and error is often the key. I tried several settings before I found the one that does what I want it to do—allow enough room to print the entire spreadsheet on the first page. Now set the bottom margin: Type **BM** and press the return key. Type **1.5** and press the return key again.

JUSTIFYING THE TEXT

Now tell AppleWorks you want to print the text with a smooth right edge so that it blends with the spreadsheet. You're still in the Printer Options screen, so type **JU** and press the return key. Now press the escape key to exit the Printer Options.

It's good to know where AppleWorks calculates the page breaks, so leave your cursor on line 4 and press OA-K to bring up the Calculate Menu. Press the return key to confirm your printer (or type a printer number, then Return). Now press OA-7 to jump the cursor to line 55. Looking good. The *End of Page 1* indicator is just after the spreadsheet.

CREATING A PAGE HEADER

The next step is to create a header for the second page. Before a header, always tell AppleWorks to start a new page: Move the cursor to line 56 and press OA-O to bring up the Printer Options screen. Type **NP** and press the return key. Press the escape key to exit the Printer Options screen.

Next, set a small top margin so that the header starts just below the top edge of the paper. Leave your cursor on line 57 and press OA-O. Type **TM** and press the return key. Type **.1** and press the return key again.

You're still in the Printer Options screen, so tell AppleWorks you want to insert the header option: Type **HE** and press the return key. Press the escape key. You're now back in the document.

Your cursor is in line 59 column 1. Press the return key to insert a blank line. Move the cursor up to line 59 and type the information that belongs in the header: **Letter to Mom and Dad**. Press the tab key eight times to move the cursor to line 59 column 61. Type **Page** and press the spacebar.

Next, tell AppleWorks to insert a page number: Press OA-O, then type **PP** and press the return key. Now press the escape key. To see what a caret stands for, press the left arrow key. At the bottom of the screen, AppleWorks displays "Print Page No."

You need some space between the header and the next paragraph. Press the right arrow key to place the cursor atop the blot next to the caret, and press the return key five times. This completes the header. Press OA-S to save all your work.

PRINTING THE DOCUMENT IN ITS FINAL FORM

Now for the fun part. Be sure your printer is on. Press OA-P to start the Print command. Now press Return three times (to confirm *Beginning*, the printer, and one copy). When the printer stops, your letter should look like the one in the **Figure**.

Love and special thanks to my son, David Witkin, soon-to-be college graduate (and, incidentally, carless) for offering to write the letter. Practicing, David?

Next month, I'll tell you how to create a bunch of your very own return-address labels. ■

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.*

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A CASE in BASIC

Learn how to construct efficient BASIC program menus and subroutines from Pascal's CASE command.

by Dan Bishop

Last month (see the March 1987 Applesoft Adviser, p. 72) we created several BASIC control structures to simulate looping mechanisms available in other programming languages. Knowing how to write code for these structures in Applesoft BASIC is necessary for translating a Pascal program into BASIC, for instance, and makes these more structured programming commands available to your Applesoft BASIC programs.

Now we'll deal with the "multiple-choice" structure known in Pascal as the CASE statement. There are several ways to construct a CASE statement in Applesoft BASIC, but the method we'll use comes closest in design to the Pascal version.

THE CASE

The CASE command that's available in several upper-level programming languages, but not in Applesoft BASIC, is a multidirectional branching structure. A good example of using the CASE statement is in conditional branching from a program menu. For example, suppose your program presents a menu with five options. The user selects option 4 from the keyboard and the program stores this value in the variable MO (menu option). The Pascal code in **Listing 1**, which represents a multiple-choice statement, directs program execution to the chosen subroutine.

When the program encounters the CASE keyword, it compares the value of the variable MO with the option values shown at the start of each line. When the program finds a match, it executes only the commands associated with that particular choice. In this example, the only command associated with each option is a subroutine (or procedure) call, and since MO has the value four, the program executes only the PRINTLIST subroutine.

The CASE statement works like a sequence of IF/THEN decisions. Each choice in the list forces the computer to compare the variable's value with the option value in the list. If the two values match, the program executes the matching subroutine. Recognizing this, you can rewrite the Pascal CASE statement in **Listing 1** in Applesoft BASIC as shown in **Listing 2**. This code assumes the appropriate subroutines exist at the listed addresses to carry out the five operations specified by the program menu and the REM statements following the GOSUB commands.

Most forms of BASIC require that subroutine calls (GOSUB 1100, for example) use numbers instead of labels or names to refer to the first line number in the subroutine. However, it's helpful to tag those references with a name for each subroutine by appending a remark statement at the GOSUB command, as shown in **Listing 2**. You should tag the block of subroutine code as well. The following REM statements would work well for the subroutine at line 1100:

```
1097 REM ********************
1098 REM ADD NEW CLIENT
1099 REM ********************
```

Notice that a GOTO is added to each case option to transfer control to the end of the block when the subroutine returns control to the line that called it. If none of the called subroutines changes the value of MO, the GOTOs aren't needed. They improve the program's efficiency slightly, though, by skipping the remaining IF statements, and cause this code to execute identically to Pascal's CASE command.

THE ON/GOSUB COMMAND

Notice that the choices in **Listing 2** rely on numbers rather than letters or words. In this case, it's possible to use a "computed" GOSUB command and avoid the sequence of IF/THEN statements by condensing lines 260–300 to a single line, as shown in **Listing 3**.

This ON/GOSUB command requires an integer value from one to five for MO, since there are five subroutine line numbers in the list. If the value is one, the program executes the first subroutine in the list. If MO equals two, it calls the second subroutine (line 1300), and so on. If MO isn't given a value from one to five, the program ignores line 260. When the program finishes executing the subroutine called by line 260, it returns control to line 270, ignoring the unused subroutine calls.

Listing 1. Example of the Pascal CASE statement.

```
CASE  MO  OF
     1 : ADDCLIENT;
     2 : EDITCLIENT;
     3 : DELETECLIENT;
     4 : PRINTLIST;
     5 : PRINTSTMNT
END (*case*);
```

Although this is a valid statement, it lacks the clarity afforded by the REM statements in the example in **Listing 2**. You can, of course, add these REMs. In any event, be sure to label each subroutine with descriptive REM statements.

The other disadvantage of the ON/GOSUB command is that the value of the variable must be a small whole number. I often prefer to select menu options by a letter that corresponds to an easily remembered verb in the description, such as A for Add client, E for Edit, F for Find, S for Save, and X for end or abort. The sequence of IF statements can easily handle this situation. To use the ON/GOSUB, you must first convert the letter entered as MO$ to an integer MO.

Listing 2. Pascal CASE statement translated to BASIC.

```
250 REM CASE  MENUOPTION  OF
260     IF MO = 1 THEN GOSUB 1100:GOTO 310
                :REM ADD NEW CLIENT
270     IF MO = 2 THEN GOSUB 1300:GOTO 310
                :REM EDIT CLIENT DATA
280     IF MO = 3 THEN GOSUB 2200:GOTO 310
                :REM DELETE CLIENT
290     IF MO = 4 THEN GOSUB 4000:GOTO 310
                :REM PRINT CLIENT LIST
300     IF MO = 5 THEN GOSUB 4500:GOTO 310
                :REM PRINT STATEMENTS
310 REM END CASE
```

Listing 3. CASE statement from Listing 2 *condensed to one line.*

```
250 REM CASE MO OF
260     ON  MO  GOSUB 1100, 1300, 2200, 4000, 4500
270 REM END CASE
```

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This brings us to sets. If the allowed options for MO$ are A, E, F, S, or X, and you want to convert these values to 1, 2, 3, 4, or 5, you need to determine the position MO$ occupies in the set [A,E,F,S,X]. The sequence in **Listing 4** initializes MO to zero, then sets its value to the proper integer if MO$ is in the set. If a match isn't found, MO remains zero.

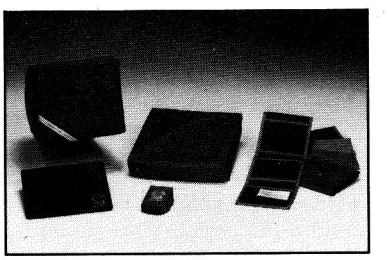
Now just execute a GOSUB 1000 after the INPUT command in which you entered MO$, and the computer returns MO, a numeric value that can be used with an ON/GOSUB command. The key to this subroutine is the MID$ function, which returns a substring from the string listed as the first argument in parentheses. In this case, the target string is AEFSX. The value of the second argument (J) determines where to find the first letter in the substring, and the third argument indicates the number of characters to be extracted for the substring. Since the third argument is a one and J is a loop counter that changes with each loop cycle, this subroutine searches for a match with MO$ by cycling through the target string one character at a time. When it finds a match, it assigns the value of J to MO and forces the loop to end by setting J to five.

Good program development never stops at the first solution to a problem, however. If you've designed a subroutine that works for a particular situation, is that or a similar situation likely to arise again? If so, can this solution handle any case that might come up? In other words, can you now write a subroutine that accepts any character string for a target string TS$ and returns a numeric value S that corresponds to the position in TS$ where a search character S$ can be found?

You realize from the above algorithm that the subroutine works with any five-character set if you assign a value to TS$ before calling the subroutine (for example, TS$ = "AEFSX" : GOSUB 1000), and use TS$ in place of the literal string in line 1020. But suppose you have only three characters or as many as eight? Use the BASIC function LEN to determine the number of characters in the target string. By applying LEN to TS$, you can determine the number of loop cycles for any length of TS$. The code in **Listing 5** shows how this works.

Listing 4. Example of using sets for selecting menu options.

```
996 REM ****************************
997 REM  FIND POSITION MO$ OCCUPIES
998 REM  IN THE SET OF A,E,F,S,X.
999 REM ****************************
1000 MO = 0
1010 FOR J = 1 TO 5
1020     IF MO$ = MID$("AEFSX",J,1) THEN
           MO = J: J = 5
1030 NEXT J
1040 RETURN
```

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Listing 5. Target-string subroutine.

```
996 REM ****************************
997 REM  RETURN POSITION S THAT S$
998 REM  OCCUPIES IN TARGET STRING TS$
999 REM ****************************
1000 S = 0
1010 FOR J = 1 TO LEN(TS$)
1020    IF S$ = MID$( TS$,J,1) THEN
          S = J: J = LEN(TS$)
1030 NEXT J
1040 RETURN
```

Listing 6. Target-string subroutine that converts a character string to a numeric value.

```
250 TS$ = "AEFSX"
260 GOSUB 1000:REM CONVERT S$ TO NUMERIC S
265 REM
270 REM CASE S OF: A     E     F     S     X
280 ON S GOSUB   1100, 1300, 2200, 4000, 4500
285 REM
290 REM   END CASE
```

Now you can construct your CASE statement to look like **Listing 6.** Notice how the REM statement in line 270 is aligned with the corresponding subroutine calls in line 280. In a sense, Pascal's vertically arranged CASE statement is oriented horizontally in our BASIC version, and works every bit as well.

Occasionally you'll develop an algorithm and end up with more than you had planned on. This is a case in point. The subroutine at line 1000 can accept more than just single-character input as S$. Suppose you want to use full words instead of mnemonic characters. You can convert the words ADD, EDIT, FIND, SAVE, and END to numeric values for the ON/GOSUB statement as well. Change line 250 to:

```
250 TS$ = "ADD EDITFINDSAVEEND "
```

Be sure to type three blank spaces before the word ADD and leave one space after ADD and one space after END. Now, at the GOSUB 1000 command, S is returned as 4, 8, 12, 16,

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or 20 if S$ contains any of these five words. Before you execute your ON/GOSUB, simply divide S by four to obtain values from one to five, and you're set. It may be wise to define S to be of integer type if you have to manipulate its value with divisions, because 8/4 could give an answer of 1.99999999, which your ON/GOSUB command can't use correctly. In Applesoft BASIC, simply append a percent sign to the end of the variable name, making it S%.

NONE OF THE ABOVE

The possibility that none of the options listed will match the variable is usually covered in most versions of the CASE statement by including the word ELSE or OTHERWISE, followed by the block of commands to be executed in this instance. The BASIC ON/GOSUB command simply goes to the next statement if it can't find a match. For example, if S equals 12, and the program encounters the line 1180 ON S GOSUB 3000, 4000, 11000, 12000, program execution simply ignores this statement and goes on to the next. This statement requires a value for S from one to four.

You can designate a block of code following the ON/GOSUB line to execute if S equals zero. (Remember, S is set to zero in the "find-match" subroutine at line 1100, and will be returned as zero if no match is found). Follow the ON/GOSUB line with an IF S <> 0 THEN GOTO nnnn command. This lets the program jump over the block of statements intended for the "none of the above" situation with the ON/GOSUB command. Using the previous example, this addition would look like **Listing 7**, which assumes the code you insert between lines 295 and 400 is the block you want to execute if S$ doesn't match A, E, F, S, or X. If any of these options is met, the program executes the appropriate subroutine call from line 280. When the program returns to line 290 (assuming the value of S hasn't changed), execution jumps immediately to line 400.

LOCAL AND GLOBAL VARIABLES

Unlike BASIC, each subroutine (or procedure) in Pascal can have its own unique set of variables. These variables are "local," since changing their values in one subroutine won't affect the values of identically named variables in another subroutine or the main program. Global variables (the use of which is discouraged in Pascal) are affected throughout the program.

All variables in BASIC are global, but you can create local variables for your BASIC programs. Suppose your program has five subroutines that use the variable ST. At the beginning of the program, you dimension an array ST (DIM ST(5)) to include one dimension for each subroutine that uses ST. You'll have to keep track of where and how you use these variables, but you now have six variables named ST to use any way you want. Use ST or ST(0) for the main program, and use ST(i) only in the i'th subroutine.

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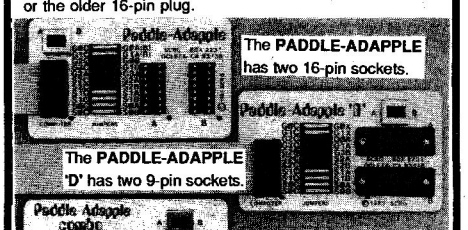

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Listing 7. Target-string subroutine that branches to another subroutine if a match isn't found.

```
250 TS$ = "AEFSX"
260 GOSUB 1000:REM CONVERT S$ TO NUMERIC S
265 REM
270 REM CASE S OF: A     E     F     S     X
280 ON S GOSUB   1100, 1300, 2200, 4000, 4500
290 IF S <> 0 THEN GOTO 400
295 REM                          OTHERWISE
    . . . . . .
400 REM   END CASE
```

Listing 8. Local-variables subroutine.

```
997 REM ************************
998 REM  CALCULATE  MPG
999 REM ************************
1000 MD(3)=MD(0): FC(3)=FC(0)
1010 GC(3) = MD(3)/FC(3)
1020 GC(0) = GC(3)
1030 RETURN
```

tine. (Nobody said this would be easy.) So, for example, if your program calculates gas consumption (GC) given miles driven (MD) and fuel consumed (FC), you call the subroutine that handles the calculation with, say, a GOSUB 1000 command. Values for MD and FC are already entered and present in the main program as MD(0) and FC(0). Your subroutine would look like the one in **Listing 8**, which simply divides the number of miles driven by the amount of fuel consumed. Assuming MD(3), FC(3), and GC(3) aren't used anywhere else in the program, these three variables are completely local. The first line of the subroutine passes the values from the main program to the subroutine (line 1000). The last line (1020) passes to the main program only those values this subroutine is supposed to affect.

In Pascal, these processes take place automatically with the procedure call CALCMPG(MD,FC,GC) in the main program. The first line in the procedure might look like this:

```
PROCEDURE CALCMPG(MD, FC : REAL;
VAR GC : REAL);
```

The VAR that precedes GC indicates that its value passes to the main program after CALCMPG has finished working on it. Since MD and FC aren't preceded by VAR, these values pass to the subroutine from the main program, but won't pass back.

What good are local variables anyway? Their main function is to make a procedure entirely independent of the program containing the subroutine. Suppose you're working on the example in **Listing 8** using Pascal. Your program uses the variables MILES, GALLONS, and MPG, and you need a subroutine to calculate MPG. You can add the above procedure to your program without making any changes, and can call the subroutine using your own variables:

```
CALCMPG(MILES, GALLONS, MPG);
```

Pascal passes the value for MILES to the first parameter listed in the procedure heading (MD). The program passes the current value in GALLONS to FC, and, when the procedure is finished and has calculated a value for GC, returns that value to the main program variable, MPG.

You can see that the computer passes a lot of values automatically in Pascal. In the BASIC example, though, you must handle all of this yourself (lines 1000 and 1020). In most cases, it's not worth the bother. This means, of course, that your BASIC subroutines aren't nearly as universally transportable between programs, but, with a little time spent changing variable names, the problem is only minor.

CONCLUSION

Although it might be possible to simulate many of Pascal's operations and structures, the difficulties in some cases outweigh the benefits. Good program design and code that's easy to read and maintain are goals next in importance to having a properly working program. Programming the CASE structure in BASIC is an example of a useful construct that fits well in good structured program design. Using local variables by confining specific array elements to subroutines adds confusion to the program and produces little benefit. In most cases, the BASIC programmer is better off using global variables.

Next month, we'll expand our use of MID$, using the subroutine in this column to build a program that calculates letter frequencies from text input. The techniques used to produce these frequencies can be useful in many other programming tasks.■

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

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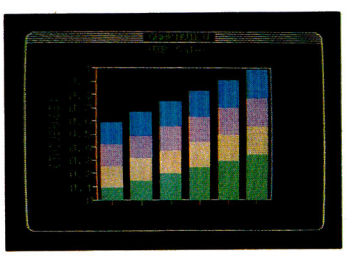

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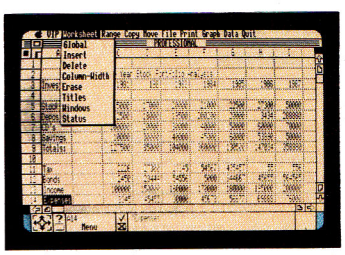

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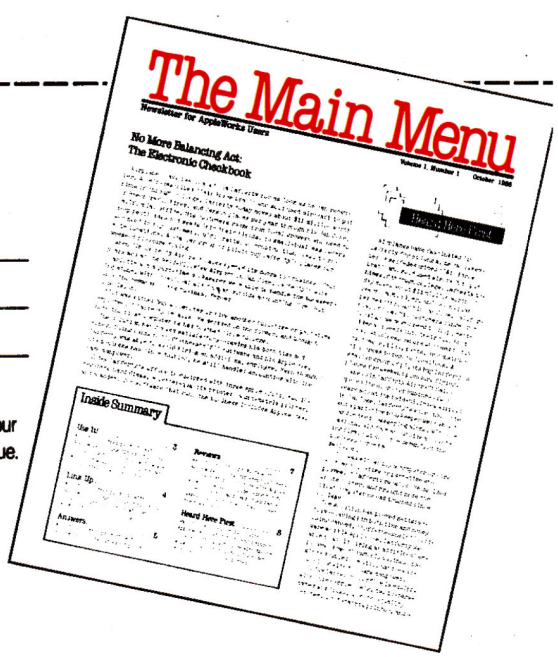

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QuickDraw Graphics

With its 4096 colors and two super-hi-res display modes, the GS produces stunning color displays. But it also introduces a problem: how to control and use this power.

by Tom Swan

Graphics is the IIGS's middle name. QuickDraw II, a set of software tools inside every GS, has more than 200 commands and two dozen new data types you can use to draw, paint, and animate colorful masterpieces.

QuickDraw II handles just about everything you see on screen. It can draw lines, circles, ovals, boxes, and polygons. It can paint shapes, display different kinds of cursors, and perform other operations that make programming computer graphics easier than with other Apple II models. This month, I'll introduce several QuickDraw II fundamentals, and list a program you can use to paint not only your computer screen, but your living room as well.

STUFFED SHELLS

Although it's easy to use QuickDraw II commands, setting up a new graphics program can be confusing. You must perform several startup details before you're ready to begin drawing. But, because these details are similar for most programs, it's best to stuff them into a shell—an empty vessel, which you later fill with your own graphics routines.

GRShell.PAS (see **Listing 1**), is the vessel used by **Listings 2** through **5**. Type it in with TML Pascal or the APW (Apple Programmer's Workshop) text editor, depending on which version of Pascal you have. As you'll recall from last month, I'm temporarily using a prerelease version of TML Pascal that runs on a Macintosh and, therefore, can't give you details on compiling programs. The GS version should be available by the time you read this. Check your manuals or write if you have any problems.

Near the end of GRShell.PAS is the dummy procedure, DoGraphics, which you replace with the real McCoy for each new graphics program. You then compile the shell to produce the final program. For those who care about such things, the sidebar, "GR Shell Details," explains how GRShell works.

QUICKDRAW II FUNDAMENTALS

A simple example shows how easy it is to write GS graphics programs. **Listing 2**, Circle, draws a large yellow circle. Although you might think it's pointless, you can use this simple program to adjust your display. First, insert all of the listing into GRShell—replacing the dummy DoGraphics procedure there—then compile and run the program.

Circle declares a single variable (r) of type Rect, one of the most important data types in QuickDraw II. A Rect is a Pascal RECORD that has four parts, or fields, named left, top, right, and bottom. (Actually, it's a bit more complicated than that, but this definition suits our purposes for now.) To define a rectangle, you assign values to each of these fields. For example, if you have a variable r of type Rect, then to declare a 100-horizontal-by-75-vertical rectangle you could write:

```
r.top := 50;
r.left := 100;
r.bottom := 124;
r.right := 199;
```

The values represent the coordinates of the top-left and bottom-right pixels (picture elements) of a rectangular area on screen. But instead of writing that many steps every time you define a rectangle, you can use the SetRect command as in the following statement:

```
SetRect( r, 100, 50, 199, 124 );
```

The four values must be in left, top, right, and bottom order. But, you might ask, why define rectangles to draw circles? The reason will be clear when you run **Listing 2**. QuickDraw II draws the circle within this rectangle's boundaries.

And this brings up an important point about GS displays. Ovals, of course, are stretched along one axis. You might think, therefore, that a perfect rectangle—perhaps one with 100 pixels on each side—would create a perfect circle. Unfortunately, that isn't what happens.

The discrepancy is due to the screen's aspect ratio, which, on the GS, is 5:6, meaning that each pixel on a 320-by-200 display is exactly 1.2 times taller than it is wide. (It's 2.4 times taller on a 640-by-200 display.) For perfect circles, make sure your

Listing 1. GRShell.PAS.

```
{$a+}                    { Create assembly language output }
{$StackSize 4096 }       { Remove or increase for large programs }

PROGRAM GRShell;

(*
 *
 * PURPOSE : Graphics shell -- insert your own DoGraphics procedure
 * SYSTEM  : Apple IIGS / TML Pascal / Super Hi-Res display
 * AUTHOR  : Tom Swan
 *
 *)


USES

   QDIntf,       { QuickDraw II interface (declarations) }
   GSIntf;       { Various other declarations (the "core" tools) }


CONST

   ScreenMode = $00;     { 320x200 graphics Super HiRes display mode }
   MaxX       = 320;     { Maximum X coordinate (+1) }
   MaxY       = 200;     { Maximum Y coordinate (+1) }


VAR

   myMemoryID    : INTEGER;     { Application ID assigned by Memory Mgr }
   toolsZeroPage : Handle;      { Handle to Zero page memory for Tools }


PROCEDURE InitGSEnviro;

{ Initialize GS tool sets }

VAR

   ToolRec : LoadToolRec;       { Defines the tools the program needs }

BEGIN
   TLStartUp;                               { Initialize Tool Locator }
   MyMemoryID := MMStartUp;                 { Initialize Memory Manager }

   ToolRec.NumTools := 2;                   { Program uses two tool sets }

   ToolRec.Tools[1].TSNum := 4;             { -- QuickDraw II }
   ToolRec.Tools[1].MinVersion := 1;
   ToolRec.Tools[2].TSNum := 6;             { -- and Event Manager }
   ToolRec.Tools[2].MinVersion := 1;
   LoadTools( ToolRec );                    { Load those tool sets }


   { Allocate 4 pages of memory in bank 0 for use by GS Tools;
     3 pages for QuickDraw; and 1 page for Event Manager }

   ToolsZeroPage :=
       NewHandle(
          4 * 256,                          { Allocate 4 pages }
          myMemoryID,                       { Memory blocks user ID }
          fixedBank + fixedblk + locked,    { Attributes }
          ptr( 0 ) );                       { Start in bank 0 }

   QDStartUp
       ( LoWord( toolsZeroPage^ ),          { Low address, 1st 3 zero pages }
         ScreenMode,                        { Display mode }
         160,                               { Maximum scan line size }
         myMemoryID );                      { Memory blocks user ID }

   EMStartUp
      ( LoWord( toolsZeroPage^ ) + $300,    { Low address, 4th zero page }
        20,                                 { Event queue size }
        0,                                  { X min clamp or limit }
        MaxX,                               { X max clamp }
        0,                                  { Y min clamp }
        200,                                { Y max clamp }
        myMemoryID );                       { Memory blocks user ID }
```

Listing continued.

horizontal dimension has about 1.2 times more pixels than your vertical. For example, these commands paint a circle inside a 50-pixel-tall by 60-pixel-wide rectangle—a perfect 5:6 ratio:

```
SetRect( r, 0, 0, 59, 49 );
PaintOval( r );
```

If this seems confusing, just follow this rule to get good-looking circles: If you know your horizontal dimension, multiply by 0.833 and round to the nearest integer to get the vertical dimension. If you know the vertical dimension, multiply by 1.2 to get the horizontal (or by 2.4 for 640-by-200 displays). In a program, you could use these equations:

```
v := round( h * 0.833 );
h := round( v * 1.2 );
```

Despite such careful planning, however, some monitors—especially composite types and TVs—still may not produce round circles. And that's where the practical side of Circle comes in. Run it and tweak the monitor's vertical-size control until the circle looks round. You can now be sure that the graphics in other programs look the way the programmers intended.

A GS COLOR CHART

Colors (**Listing 3**) expands the simple circle program into a full-color chart. Again, SetRect defines a starting rectangle in which QuickDraw II draws filled ovals. This time, however, the rectangle is long and the ovals look like so many cigars standing on end.

Each cigar shape has one of 16 possible colors, including black. The first FOR statement draws the cigars, using OffsetRect to move rectangle r 20 pixels to the right for each new color. You can use OffsetRect to move rectangles anywhere on the display, generally using the form OffsetRect(r, h, v);, where r is a variable of type Rect, h is the value you add to the left and right fields in r, and v is the value you add to the top and left. Use negative values for h to move rectangles left and for v to move up. You could simply add values directly to r.top or r.left, but using OffsetRect is easier.

The second FOR loop in **Listing 3** labels the colors from zero to 15, showing the values you can use in calls to tool SetSolidPenPat to display shapes in that color.

Listing continued.

```
    SetBackColor( 0 );              { Set background to black }
    SetForeColor( 15 );             { Set foreground to white }
    MoveTo( 297, 199 );             { Display my initials }
    DrawString( 'T.S.' )            { in lower right corner }

END; { InitGSEnviro }


PROCEDURE ShutDownGSEnviro;

{ Prepare to end program.  Deinitialize tools previously initialized. }

BEGIN
    GrafOff;                        { Turn off graphics }
    EMShutDown;                     { Shut down event manager }
    QDShutDown;                     { Shut down QuickDraw II }
    MMShutDown( MyMemoryID );       { Shut down memory manager }
    TLShutDown                      { Shut down tool locator }
END; { ShutDownGSEnviro }


PROCEDURE WaitForEvent( eventKind : INTEGER );

{ Wait for an event identified by eventKind }
{ Call whenever you want to pause, say, for a mouse click }

VAR
    event : EventRecord;
    done  : Boolean;

BEGIN
    done := FALSE;
    REPEAT
        IF GetNextEvent( everyEvent, event )
            THEN done := ( event.what = eventKind )
    UNTIL done
END; { of WaitForEvent }


PROCEDURE DoGraphics;

{ Fill in this procedure with your own graphics commands }

BEGIN

    WaitForEvent( MouseDown )     { Optional -- wait for mouse click }

END; { DoGraphics }


BEGIN
    InitGSEnviro;                   { Initialize tool sets }
    ShowCursor;                     { Or use HideCursor for no pointer }
    DoGraphics;                     { Display graphics }
    ShutDownGSEnviro                { Prepare to end program }
END.
```

End of Listing.

Listing 2. Circle.

```
PROCEDURE DoGraphics;

{ Display circle }

VAR

    r : Rect;

BEGIN
    SetRect( r, 85, 38, 234, 162 );      { Define rectangle (l,t,r,b) }
    SetSolidPenPat( 9 );                 { Select yellow drawing color }
    PaintOval( r );                      { Display circle }
    WaitForEvent( MouseDown )            { Wait for mouse click }
END; { DoGraphics }
```

PAINTING WITH PALETTES

QuickDraw II lets you select one of 16 drawing colors in 320-by-200 displays. To select a color, pass a value from zero to 15 to SetSolidPenPat. **Figure 1** lists the colors that go with these color numbers.

It's important to understand that color numbers aren't fixed to specific hues. Instead, they refer to tables or palettes in memory that define the actual colors you see.

Figure 2 shows how the GS stores palette color values in memory. A color value is an integer that has 4 unused bits plus three other groups of 4 bits that specify red, green, and blue levels. To design a color, you specify various amounts of red, green, and blue. A full amount of the three colors makes white; a zero amount of each makes black. Because each component takes 4 bits, its value ranges from zero to 15, making a total of 4096 (16 × 16 × 16) possible combinations from zero (black) to 4095 (white).

After designing a new color, you insert the color value into one of a palette's 16 slots. Later, you use the number of that slot in a call to SetSolidPenPat to draw in the new color.

Let's say you want to draw a reddish-purple circle. First, you calculate a color value with a full amount of red, about half as much blue, and no green. This gives the following binary value:

```
0000 1111 0000 1000
      (R)  (G)  (B)
```

In hexadecimal, this value is $0F08, or 3848 in decimal. To insert the new color value into a palette, use SetColorEntry this way:

```
SetColorEntry( 0, 4, 3848 );
```

The first parameter in parentheses is the palette number zero to 15. You normally specify palette zero because, unless you tell QuickDraw II otherwise, it uses that palette for the entire display. The second parameter is the palette slot number (zero to 15), which holds the new color value, the third parameter to SetColorEntry.

Finally, drawing the reddish-purple circle requires only two steps. Select drawing color 4—the palette slot number into which you inserted the color value—and paint the circle with these commands:

```
SetSolidPenPat( 4 );
PaintOval( r );
```

When you change color values in palettes, remember that all pixels on screen take their colors from the same palette entries—if you change an entry to which pixels refer, the pixels immediately change color. We can put this knowledge to good use, as the next example shows.

Figure 1. Pass these color values to SetSolidPenPat to select a drawing color for standard 320-by-200 displays.

0 Black
1 Dark Gray
2 Brown
3 Purple
4 Blue
5 Green
6 Orange
7 Red
8 Pink
9 Yellow
10 Light Green
11 Light Blue
12 Light Purple
13 Blue-Gray
14 Light Gray
15 White

STANDARD COLOR WHEELS

The other day, while deciding which color to paint the living room, I realized I could use my GS to display a standard color wheel. Such a wheel shows the six primary colors of light—the three additive primaries red, green, and blue, and the three subtractive primaries yellow, cyan, and magenta.

These colors, plus six others in between, have important visual relationships. Opposing colors complement each other and produce good-looking contrasts. Adjacent colors produce pleasing harmonies. Warm colors are at the top right of the wheel; cool colors are at the bottom left. To select paint for a room, you might choose adjacent colors for walls and trim, and pick a complement for furniture fabric. You might also try lighter shades than the program shows.

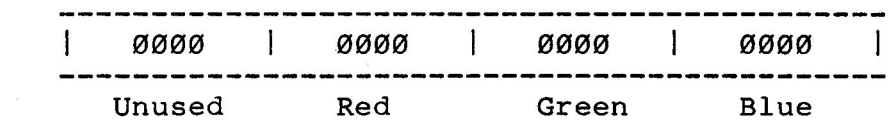
The Wheel program in **Listing 4** first sets a palette variable of type ColorTable to 12 new color values. A ColorTable is an array of integers with color-level values arranged according to **Figure 2**.

After assigning new color values to the array, tool SetColorTable inserts these values into palette zero, replacing QuickDraw II's standard colors. The rest of the program then paints 12 wedges by calling another tool, PaintArc, as follows:

```
PaintArc( r, angle, arc );
```

PaintArc, like PaintOval, takes a Rect variable to define a starting place from which to draw an arc. The point of the arc is in the center of the

Figure 2. A 16-bit integer specifies a color value as stored in a GS color table or palette.



Listing 3. Colors.

```
PROCEDURE DoGraphics;

{ Display 16 solid circles }

VAR

   r : Rect;
   color, x: INTEGER;


BEGIN
   SetRect( r, Ø, 4Ø, 19, 14Ø );          { Define starting rectangle }
   FOR color := Ø TO 15 DO                { All 16 colors - Palette Ø }
   BEGIN
      SetSolidPenPat( color );            { Pick new drawing color }
      PaintOval( r );                     { Display oval }
      OffsetRect( r, 2Ø, Ø )              { Shift area 2Ø pixels right }
   END; { for }

   FOR x := Ø TO 15 DO                    { Label colors with their }
   BEGIN                                  {  their palette entry numbers }
      MoveTo( 5 + ( x * 2Ø ), 16Ø );
      IF x > 9 THEN DrawChar( '1' );
      DrawChar( CHR( ORD( 'Ø' ) + ( x MOD 1Ø ) ) )
   END;

   WaitForEvent( MouseDown )              { Wait for mouse click }
END; { DoGraphics }
```

Listing 4. Wheel.

```
PROCEDURE DrawLabels;

{ Label color wheel }

BEGIN
   MoveTo( 148,  31 ); DrawString( 'Red' );
   MoveTo( 143, 177 ); DrawString( 'Cyan' );
   MoveTo( 235, 135 ); DrawString( 'Green' );
   MoveTo(  52, 135 ); DrawString( 'Blue' );
   MoveTo( 235,  72 ); DrawString( 'Yellow' );
   MoveTo(  25,  72 ); DrawString( 'Magenta' );
   MoveTo(  1Ø,  15 ); DrawString( 'Color Wheel' );
END; { DrawLabels }


PROCEDURE DoGraphics;

{ Display something }

CONST

   arc = 3Ø;    { Arc angle }

VAR

   palette : ColorTable;
   r : Rect;
   angle, p : INTEGER;

BEGIN

{  Palette  No.  Decimal          Hex     Color                }

{  ------------------------------------------------------------ -}
{                                  RGB                         }
```

Listing continued.

Tricks, Tips, and Tidbits

Some people find the control-panel RAM-disk settings confusing. To set up a RAM disk, press Open apple-Control-Escape and release Escape to call up the control panel. Select the RAM-disk page. The minimum setting is the size of the RAM disk you want ProDOS to reserve whether or not you ever store anything there. The maximum setting is the amount of memory to which you want to limit a RAM disk.

Probably the best setting is zero for minimum and 256K for maximum (512K if you have a RAM-extension card). This reserves space for a RAM disk only if you store something there. If you don't use the RAM disk, then the zero minimum setting makes all of memory available to programs.

Remember also that any change to your RAM-disk size requires you to turn off the computer and then turn it back on before the change takes effect. Merely rebooting isn't enough.

Another control-panel feature appears to have a bug. To see it, select the Options page. At the bottom of the screen, you should see the advanced feature "high-speed mouse." Use the arrow keys to change this setting to read "yes." Then press Return, Escape, Return, Return to get back to whatever you were doing.

The next time you turn on the GS, however, the mouse speed remains in the slow setting. This seems to happen only the first time you enter the Launcher—the window that lets you run programs. To fix the problem, simply call up the control panel and press Return. That wakes up the slow mouse and makes it fast.

When using a graphics program such as PaintWorks, remember that you can change the mouse speed. The slower setting might help you draw fine details. Use the faster setting for quick brush strokes and rapid filling.□ **—T.S.**

Listing continued.

```
    palette[ 00 ] := 0000;        { 0000  -- Black                }

    palette[ 01 ] := 3840;        { 0F00  -- Red                  }
    palette[ 02 ] := 3968;        { 0F80  -- Orange               }

    palette[ 03 ] := 4080;        { 0FF0  -- Yellow               }

    palette[ 04 ] := 2288;        { 08F0  -- Yellow-Green         }

    palette[ 05 ] := 0240;        { 00F0  -- Green                }

    palette[ 06 ] := 0248;        { 00F8  -- Green-Blue           }

    palette[ 07 ] := 0255;        { 00FF  -- Cyan                 }

    palette[ 08 ] := 0143;        { 008F  -- Blue-Green           }

    palette[ 09 ] := 0015;        { 000F  -- Blue                 }

    palette[ 10 ] := 2063;        { 080F  -- Purple               }

    palette[ 11 ] := 3855;        { 0F0F  -- Magenta              }

    palette[ 12 ] := 3848;        { 0F08  -- Reddish purple       }

    palette[ 13 ] := 0000;        { not used                      }

    palette[ 14 ] := 0000;        { not used                      }

    palette[ 15 ] := 4095;        { 0FFF  -- White                }


    SetColorTable( 0, palette );      { Activate the new palette  }
    SetRect( r, 85, 38, 234, 162 );  { Define rectangle (l,t,r,b) }

    angle := 360 - ( arc div 2 );     { Start with vertical wedge }

    FOR p := 1 TO 12 DO               { Draw 12 filled wedges }
    BEGIN
       SetSolidPenPat( p );               { Select color from palette }
       PaintArc( r, angle, arc );         { Draw & fill one wedge }
       angle := ( angle + arc ) MOD 360   { Change angle for next wedge }
    END; { for }

    DrawLabels;

    WaitForEvent( MouseDown )     { Wait for mouse click before ending }

END; { DoGraphics }
```

End of Listing.

Listing 5. Animation.

```
PROCEDURE RotatePalette( pn, start, stop : INTEGER );

{ Rotate values start through stop in palette number pn }
{ Assume: 0 <= pn, start, stop <= 15; start <= stop }

VAR

   c1, c2 : ColorValue;          { Color RGB levels from palette }
   j : INTEGER;                  { FOR-loop control variable }

BEGIN

   c1 := GetColorEntry( pn, start );     { Save starting color }
   FOR j := start TO stop - 1 DO         { Shift palette values }
   BEGIN
      c2 := GetColorEntry( pn, j + 1 ); { Get one palette entry }
      SetColorEntry( pn, j, c2 )         { Store as a new entry }
   END;
   SetColorEntry( pn, stop, c1 )         { Assign last entry }

END; { RotatePalette }


PROCEDURE Pause( time : INTEGER );

{ Pause for a length of time (no relation to real time) }
```

Listing continued.

Listing continued.

```
VAR

   j : INTEGER;

BEGIN
   WHILE time > Ø DO
   BEGIN
      FOR j := 1 TO 1ØØ DO { wait };
      time := time - 1
   END { while }
END; { Pause }


PROCEDURE Animate;

{ Animate the color wheel palette until mouse click detected }

VAR
   event : EventRecord;
   done  : Boolean;

BEGIN
   done := FALSE;        { Preset done flag }
   REPEAT

    RotatePalette( Ø, 1, 12 );                    { Do one rotation }
    Pause( 45 );                                  { Pause briefly }
    IF GetNextEvent( everyEvent, event )          { Check for mouse }
      THEN done := ( event.what = mouseDown )     {  down event. }
UNTIL done
END; { Animate }
```

End of Listing.

rectangle. The angle tells QuickDraw II where to draw the left side of the wedge; the arc variable tells it how far to the right to draw the other side. By repeating this 12 times and advancing the angle by 20 degrees for each new wedge, the program draws a circle of 12 wedges, each with a different color. Another procedure, DrawLabels, identifies the six primary colors and adds a title to complete the display.

SIMPLE ANIMATION

A neat trick you could try is to animate a GS graphics program by experimenting with color values in the palettes. Because each pixel takes its color from a palette, if you change the entries in a palette, you automatically change the color of all pixels that take their colors from that palette.

Taking this idea one step further, if you rotate palette values, the pixels will appear to pass their colors on to their neighbors. Clever artists can use this trick to animate waterfalls with moving water, crash waves onto a beach, or move clouds across the sky.

To animate the color-wheel program in **Listing 4**, add all of **Listing 5**, Animation, just above procedure DrawLabels. Then, change the last line of procedure DoGraphics to read:

```
WaitForEvent( MouseDown );
Animate;
```

Now, when you click the mouse button, the color wheel spins! But it's only an illusion—procedure RotatePalette, which you can extract to animate your own programs, simply shifts the color values in palette zero around in a circle by using the tools GetColorEntry and SetColorEntry.

GetColorEntry reads one color value from a palette. It's a function, a procedure that returns a value. To use it, pass the palette number and position you want to read, and assign the function result to any integer variable. For example, Color := GetColorEntry(8, 5); reads color 5 from palette 8.

To change a color value in a palette, use SetColorEntry. To set color 7 in palette zero to magenta (0F0F hex or 3855 decimal), you could use the statement:

```
SetColorEntry( 0, 7, 3855 );
```

These examples display only a small portion of the QuickDraw II tool set's power. As this article demonstrates, you can get a lot of color, draw circles and other shapes, and even animate displays with a minimum number of programming steps. But in a single article, it's impossible to cover all of what QuickDraw II offers. It's a subject to which we'll return again and again.■

Write to Tom Swan at Swan Software, P.O. Box 206, Lititz, PA 17543.

GRShell Details

GRShell (**Listing 1**) has several interesting details, among them two interfaces to the GS toolbox, QDIntf and GSIntf. The first contains declarations that tell the compiler how to access the QuickDraw II tool set; the second contains general GS declarations, or core tools, as they're called in TML Pascal.

Two constants, ScreenMode and MaxX, set up a 320-by-200 display. MaxY never changes from 200. Assign hexadecimal $80 to ScreenMode and 640 to MaxX for a 640-by-200 display.

Procedure InitGSEnviro and the two global variables, myMemoryID and toolsZeroPage, initialize the GS super-hi-res display. InitGSEnviro loads the QuickDraw and Event Manager tool sets and prepares zero-page variables for those tools to use. It also calls the tool initializers QDStartUp and EMStartUp to supply various parameters, which are commented in **Listing 1**.

InitGSEnviro also displays my initials in the lower right corner. It sets the background color to black and the foreground color to white with calls to SetBackColor and SetForeColor. It then moves an invisible pen to coordinate (297,199) and draws T.S. by calling tool DrawString. Notice that you have to *draw* text on a GS display—there are no write or writeln commands as in many other Pascal versions.

ShutDownGSEnviro reverses what InitGSEnviro does. The shell calls this procedure to tell the tools that we're done using them.

Procedure WaitForEvent takes a single parameter, eventKind, which you usually set to either MouseDown or KeyDown—two constants that QDIntf defines. For example, to wait for someone to click the mouse button, you could write:

```
WaitForEvent( MouseDown );
```

You usually include this statement as the last command in your DoGraphics procedure. Clicking the mouse button then ends the program and returns to the launcher, the desktop manager, or the APW command prompt, depending on how you run the program.□ **—T.S.**

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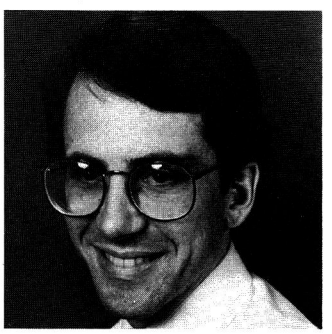
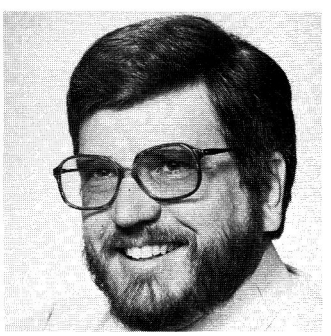


by David Goodrum



and Joel Robbins

As computer coordinators, we know how hard it is to assist teachers when each uses a different set of classroom-management, word-processor, database, spreadsheet, and CAI (computer-assisted instruction) software. Many teachers use AppleWorks for tasks such as keeping track of student grades and creating tests, so why not also use it for teaching? And that's where *AppleWorks-assisted instruction* (AAI) comes in. You can add *instructional* templates to the list of AppleWorks templates you already use, and parents can use AAI at home with their children. This takes integration a step further, and capitalizes on AppleWorks' flexibility.

AAI can also help the many teachers in schools that have only one computer per classroom, and complete or complement almost any educational task. This month we'll show you how to set up two AppleWorks templates that let students practice math and language-arts skills. And you won't have to shut down AppleWorks, which could have seating charts, gradebooks, written reports, and many other items on the desktop. Of course, templates such as these won't take the place of truly sophisticated CAI, but can help bridge the gap until student labs and classrooms have more computers.

MATHDRILL

This template uses the Choose function to display varying numbers in columns D and F (see **Figure 1**) to make up math problems. You place the cue number, which selects new problems from the formulas in columns C and E, into cell B4. Each time you change this number, new problems appear in each section of the spreadsheet. The Choose function should be easier to understand after you use this template.

First add a spreadsheet file from scratch to the desktop and name it MATHDRILL. Now use the OA-L (Layout) command to shrink column D to five spaces, column F to three spaces, and column H to one space: Choose *Columns*, press Return, choose *Column width*, press Return, and use OA-left arrow for each column.

Next, type the directions shown in **Figure 1** into rows 1 and 2, and place a line in row 3 using the hyphen key. (Remember to press Shift-'' before typing a label that begins with a number or symbol.)

Refer to **Figure 1** and type SETUP(((into cell A4, PROBLEM >>>>>>>>>>> beginning in cell A5, X into cell D5, an equal sign into F5, and <<-- ANSWER HERE beginning in cell I5.

Now place these formulas into cells C5 and E5, respectively:

```
@CHOOSE(B4,2,4,8,6,3,8,5,10,4,7,1)
@CHOOSE(B4,7,2,3,6,5,9,8,5,4,1,10)
```

Don't worry about the NAs (not available) that appear in these cells. They just indicate that you didn't give the spreadsheet enough information to perform a Choose function.

Type the information in row 7 of **Figure 1** into row 7 of your spreadsheet. Now type the following formula into cell G7:

```
@IF((C5*E5)=G5,(C5*E5),0)
```

Type <<-- CHECK HERE beginning in cell I7. Now put another line of hyphens across row 8.

Follow the steps below to quickly copy this question format to other parts of the spreadsheet as shown in **Figure 1**:

1) Move the cursor to row 5
2) Press OA-C (Copy)
3) Choose *To clipboard*
4) Use the down arrow key to highlight rows 5, 6, and 7
5) Press Return
6) Move the cursor to row 9
7) Press OA-C
8) Choose *From clipboard*

Now repeat steps 6 through 8 with your cursor on rows 13 and 17.

Type the appropriate math operation into column D for each problem as shown in **Figure 1**.

To create a different set of numbers for each problem, type (or edit, using OA-U) the formulas below into the appropriate cells to replace those already copied there from the multiplication section:

```
C9: @CHOOSE(B4,8,6,5,8,4,3,2,1,8,7,10)
E9: @CHOOSE(B4,4,5,4,5,8,9,12,3,4,5,7)
G11: @IF((C9+E9)=G9,(C9+E9),0)
C13: @CHOOSE(B4,28,37,14,18,65,80,9,
     8,7,45,77)
```

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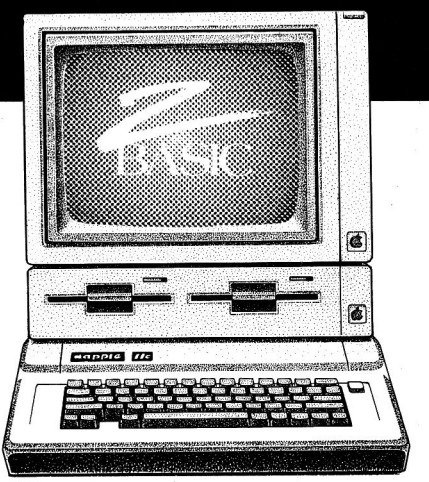

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Micol BASIC™ ProDOS	647	354
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E13: @CHOOSE(B4,7,25,5,9,47,29,2,
5,3,29,58)
G15: @IF((C13 – E13) = G13,(C13 – E13),0)
C17: @CHOOSE(B4,10,51,54,77,44,
19,23,9,7,27,95)
E17: @CHOOSE(B4,3,7,8,9,10,7,4,2,3,8,15)
G19: @IF(@INT(C17/E17) = G17,
@INT(C17/E17),0)

Now place your cursor in column D and press OA-L. Choose *Columns*, press Return, and choose *Label format* and *Center*. This centers the math-function symbols in the column, separating them from the first number used in the problems. Repeat this for column F to separate the equal sign from the numbers in column E.

To protect your hard work, place your cursor in cell A1, press OA-L, choose *Block*, use OA-right arrow once, then OA-down arrow once, then the down arrow twice to highlight the entire worksheet, hit Return, and choose *Protection* and *Nothing*. This protects your spreadsheet, and you can't enter anything into any of the cells containing labels or formulas.

So that students can enter the Setup number and type in their answers to the problems, follow these directions for cells B4, G5, G9, G13, and G17:

1) Place the cursor in the appropriate cell
2) Press OA-L (Layout)
3) Choose *Entry*
4) Choose *Protection*
5) Choose *Values only*

Notice that we've added (NEAREST WHOLE) in cell I18, and the @INT function in the division-problem formulas to avoid rounding difficulties with earlier versions of AppleWorks. If you have version 2.0, though, you can use the new @ROUND spreadsheet function to specify the values.

USING MATHDRILL

To use Mathdrill, simply type a number from one to 11 into cell B4. Numbers should replace the NAs, and you now have four problems to solve. Type your answers into cells G5, G9, G13, and G17. If your answers are correct, the same numbers appear two cells below each answer; if they're wrong, zeroes appear in those cells.

In this application, the Choose function simply looks for a number from one to 11 in cell B4. If you type a one into B4 and the Choose function is in cell C9 (see above), an eight appears in cell C9. If you type a two into B4, C9 will display a six—and so on.

An AppleWorks feature that adds versatility is the open apple-U key combination, which lets you edit and replace the numbers in the Choose formulas to vary the drill. You can also use the Copy function (OA-C) to duplicate the entire spreadsheet below the original, as many times as you want, to produce many more problems. One drawback to this is the lengthy automatic calculation time required to check answers if you expand the spreadsheet to more than eight sections. To solve this, you could save multiple versions of this template under different names, load them onto the desktop at the same time, and use OA-Q to toggle from one to another. By leaving the math operation unchanged after you copy the question format, you could create a four-section drill with 44 different math problems of the same type.

Figure 1. Math-drill template.

```
File: MATHDRILL              REVIEW/ADD/CHANGE                Escape: Main Menu
========A========B========C======D======E=====F=====G====H====I========J===
 1| Enter a number between 1 and 11 into the cell to the right of SETUP(((
 2| then enter your answer and check for correctness below it.
 3| ---------------------------------------------------------------------
 4| SETUP(((          1
 5| PROBLEM >>>>>>>>>>        2  X          7 =         14 <<-- ANSWER HERE
 6|
 7| If this number matches, answer is correct ->        14 <<-- CHECK HERE
 8| ---------------------------------------------------------------------
 9| PROBLEM>>>>>>>>>>>        8  +          4 =         11 <<-- ANSWER HERE
10|
11| If this number matches, answer is correct ->         0 <<-- CHECK HERE
12| ---------------------------------------------------------------------
13| PROBLEM>>>>>>>>>>>       28  -          7 =         20 <<-- ANSWER HERE
14|
15| If this number matches, answer is correct ->         0 <<-- CHECK HERE
16| ---------------------------------------------------------------------
17| PROBLEM>>>>>>>>>>>       10  /          3 =          7 <<-- WHOLE NUMBER
18|                                                        (NEAREST WHOLE)
19| If this number matches, answer is correct ->         0 <<-- CHECK HERE
---------------------------------------------------------------------------
```

ALPHA

Our next template uses the database to help elementary students learn to alphabetize simple lists, or to help high-school business teachers check the accuracy of students who must learn to alphabetize complicated names for filing. It's a fairly specialized application, but should give you some ideas for creating other examples of AAI.

To create Alpha, add a database file to the desktop from scratch and name it ALPHA. Use OA-Y to erase Category 1 from the Change Name/Category screen. Next, type ORDER for the first category name and press Return. Use the same method to add the following categories: NAME, ORIGINAL, INSTRUCTIONS, and CORRECTED LIST.

Hit the escape key to stop adding categories, then press the spacebar, which leaves you in the single-record display. Place your cursor in the CORRECTED LIST category and press OA-V. Hold down the underline key until you get a beep, then hit Return, followed by Escape to set up an underlined blank as a standard value for this category, which we'll explain how to use later.

Next, press OA-down arrow until the notation above the double line reads "Record 15 of 15." (This template can, of course, handle much longer lists.) Press OA-Z to bring up the multiple-record display.

Now press OA-L to create your layout. With your cursor in the ORDER column, press OA-left arrow to shrink that column by four spaces. Use the tab key to jump to the NAME column and expand it by five spaces. Shrink the ORIGINAL category by five spaces and expand INSTRUCTIONS by 22 spaces. Move your cursor to the CORRECTED LIST category and use OA-D to delete it from this display—we won't need it until later. Use the left-arrow key to get the ORDER category back on screen, then press Escape twice to return to the Review/Add/Change screen.

Use the tab key to place your cursor in the NAME column, type the first name shown in **Figure 2**, then press Return. Type in the other names, then move your cursor to the next column and type in the original numbers. Press the tab key again and type the instructions into the last column.

USING ALPHA

Now that you've completed the template, have a student arrange the names into alphabetical order by typing numbers one to 15 into the ORDER column. After he or she has entered the numbers, place the cursor in the NAME column and press OA-A to arrange the names from A to Z. If the student has correctly alphabetized the list, the numbers in the ORDER column will be in correct numerical order.

Reset the template for another student by arranging the ORIGINAL column with OA-A (choose *From 0–9*). You can quickly erase a student's answers by using OA-Y on their first answer (Record 1), pressing Return, then using OA-'' to quickly copy the blank down that column.

If you'd like to turn this exercise into a test paper, press OA-P and choose to create a table format. Name it TEST and press Return. While you're in the Format screen, press OA-D to delete the ORDER, ORIGINAL, and INSTRUCTIONS categories (they're not deleted from the template, just excluded from printing).

Next, expand the CORRECTED LIST column to the right margin by holding down OA-right arrow. Press OA-N and press Return again. This places your cursor over the first category name. Now type Name, Date, and Course on this line as shown in **Figure 3**, and press Return. Press OA-O, type PH, and press Return to eliminate the print header from your test. Press DS and Return to allow more room for student answers. Press the escape key to return to the print format, then press OA-P to print the test.

Next month, we'll create templates for teachers and parents who coach or help with summer sports programs.■

David Goodrum and Joel Robbins are developers of SchoolWorks templates for AppleWorks, published by K–12 MicroMedia Publishing, and other educational software. Write to them at Tulip Tree House 1016, Bloomington, IN 47401. Enclose a stamped, self-addressed envelope if you want a personal reply.

Figure 2. Alphabetizing template.

```
File: Alpha                    REVIEW/ADD/CHANGE              Escape: Main Menu
Selection:  All records

ORDER    NAME                    ORIGINAL  INSTRUCTIONS
=============================================================================
-        Joiner                  1         Use arrows to move up and down.
-        Hochstetter             2         -
-        Bannister               3         TAB key lets you move to the right.
-        Schmidt                 4         -
-        Hostetler               5         Apple-TAB lets you move to the left.
-        Robison                 6         -
-        Jones                   7         Apple-1 sends cursor to the top and
-        Smith                   8         Apple-9 sends it to the bottom.
-        Johnson                 9         -
-        Jackson                 1Ø        In ORDER column, number the names
-        Robertson               11        for alphabetizing.  Then use Apple-
-        Bachster                12        A to arrange the NAME column alpha-
-        Robinson                13        betically.  If your list is correct
-        Jenkinson               14        the numbers in the 1st column will
-        Cooper                  15        be in order.
-----------------------------------------------------------------------------
Type entry or use @ commands                                    @-? for Help
```

Figure 3. Bottom half of the test print-format screen.

```
------------------------------------------------------------------------------
Name_____________________Date_____Course_____________________
NAME          CORRECTED LIST
-A---------   -B-------------------------------------------------------------
Joiner        _____________________________________________________________
Hochstetter   _____________________________________________________________
Bannister     _____________________________________________________________

------------------------------------------------------------------ More --->
Use options shown above to change report format                198K avail.
```


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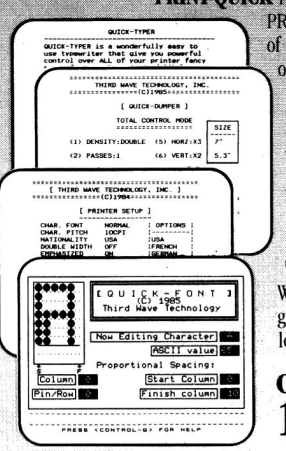

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Continued from p. 37

SOFTDISK

Softdisk, P.O. Box 30008, Shreveport, LA 71130

Magazine on disk; 64K Apple II or later
$9.95/issue, $69.95/year (12 issues)
Rating: ■■■■

Despite our continually evolving computer technology, most of the information we receive still comes via old (broadcast) or antique (printed) media. Softdisk and UpTime, two monthly magazines on disk for your Apple computer, represent an emerging segment of the publishing industry that promises to bring us further into the age of electronic information.

After studying several recent issues of each, I was somewhat disappointed with both magazines, mainly because of their split personalities—while their main thrust is to provide ready-to-run programs, they're also like their conventional ancestors, with pages and pages of less interesting text information (reviews, letters, and editorials). Neither quite lives up to its potential, but both bear watching. The concept of a resource on disk that communicates in ways a printed magazine can't is intriguing.

BLUE-PLATE SPECIALS

Softdisk is the older of the two, beginning in October 1981 with single-disk format. Today, the publisher claims, more than 15,000 subscribers receive the magazine's programs and features, supplied on two double-sided disks each month.

Softdisk's title page is followed by an original, attractive hi-res main-menu screen. Across the top is the Softdisk logo and the issue date and number. Options listed at the bottom of the screen let you toggle the display between dark characters on a light background and vice versa, turn background music on or off, or print a displayed menu or program instructions. This footer also indicates what the arrow keys will do for the current menu and reminds you that the escape key returns to the main menu. I found this interface consistent and easy throughout Softdisk, and much preferable to the various command interfaces that appear when you run each issue's individual programs.

What's contained on Softdisk's four sides? Variety, pure and simple. From the main menu, besides reading or printing a table of contents, you can read the monthly editorial, scan the "Random Events" column, or visit a Q&A department called "Readers Write." Most of these text files were interesting, but struck me as being of little value in terms of effectively using the magazine's disk space.

The above departments, however, are not the meat of Softdisk. Each issue contains a "Blue-Plate Special" program that's often worth the cost of the whole product, several in the issues I reviewed being commercial arcade games such as Spy's Demise from Polarware (formerly Penguin Software). Granted, none of these aging games matches a brand-new Skyfox or some other hit for $30 or more, but each stands as an entertaining, challenging program. Youngsters will get the most out of these features; I admit, though, to spending a few hours trying to outwit my Apple in the chess-like strategy game Pensate.

I also liked "Picture This," which presents a cornucopia of graphics. "Gallerie d'Art" is a bimonthly exhibit of famous art from around the world accompanied by a commentary describing each piece; a second section features clip-art images for Broderbund's Print Shop. Examples include logos for all major-league baseball and football teams.

Softdisk also includes grade-school and perhaps junior-high-level programs on educational topics such as geography, addition, and history. You can find disk and programming utilities in the "Happy Hacker" department and some fairly useful programs, such as a mini-database for your videotape collection, in "HelpWare." Overall, I found programs and information of interest to both children and adults.

A FEW SOFT SPOTS

While I was impressed with Softdisk's variety, quality, and menu interface, I found a few lemons. One example is a utility I doubt I'll ever use that converts the letters in phone numbers (such as 999-HELP) to digits (999-4357).

I also disliked the Softdisk packaging. I almost needed a crowbar to pry open the 8½-by-11-inch plastic case, only to find two floppy disks floating around with some promotional material. How about printing each disk's contents on the floppy jacket and shrinking the bulky package, as UpTime does?

No printed documentation comes with the product, but none is needed—nearly all menu choices (programs and text features) offer a "Read All About It" option along with a "Run It" selection. This on-line documentation is more than sufficient and can be printed if you like.

Softdisk's publisher provides free phone support and will replace any defective disks. At press time, the firm had announced plans to change from DOS 3.3 to ProDOS format in early 1987.

UPS AND DOWNS

UpTime, launched in June 1984, has gained wide acceptance in a relatively short time, with a claimed circulation of more than 30,000. Compared to Softdisk, an issue of UpTime contains one double-sided disk instead of two. Each issue includes ten programs—most striking me, collectively, as worth the price of admission, though no single program stood out as did some Softdisk "specials."

UpTime's main menu is cute when you first see it. Instead of using arrow keys, you type the number of the menu option you want. This dislodges a hanging pistol, which tumbles, falls, and fires a bullet to highlight and invoke your selection, accompanied by sound effects. I found this unique interface amusing at first, but impractical and irritating after the third or fourth repetition. (At press time, Viking Technologies was planning a new menu interface.)

UpTime provides a variety of text-screen departments (editorials, Q&A, and product reviews), along with programs of varying quality and utility. One program that really caught my eye was Vizi-Sort. Targeted for programmers, it uses hi-res graphics to visually illustrate various sorting algorithms (a bubble sort, select sort, shell sort, and quick sort), letting you see their comparative speed and efficiency on random or reverse-order arrays. As well as any other program or article, this small utility demonstrates how applications on disk can teach more effectively than words in a printed magazine or book.

Card Scramble provided a decent challenge—a solitaire game in which you must arrange cards by suit and face value. Since you start with a scrambled deck, it takes a fair amount of strategy and planning to make the right moves. I found another utility, Disk Labeler, simple but effective, letting you print up to 63 filenames on a label as well as specify control codes for your printer.

Unfortunately, such programs formed a minority of each issue's ten entries. The rest struck me as space fillers, such as Yarns (a silly run-on series of supposedly humorous nonsense sentences) or Magic Squares (a mathematical demonstration of the Apple's speed and power, which didn't leave me as dazzled as the promotional copy promised). Most of the UpTime programs, such as a political game called "Governor Run" or a trivia quiz for *Star Trek* fans, seem suited for children aged 9 to 14, with comparatively few geared to adults.

Other UpTime features lack quality. The "News and Views" column in one issue appeared to be completely unedited, and so badly written I cringed. You can't page up (backward) through text or print a table of contents (though the latter is already on the disk envelope).

Since each program includes sufficient on-line instruction, no printed documentation is provided. The publisher offers toll-free technical support and replacement of defective disks.

TWO SIDES OF A DISK

Softdisk outclasses UpTime in both breadth and quality. It's easier to use, provides greater utility, and seems responsive to its readers, citing reader feedback as a factor in its decision to change to ProDOS. By contrast, UpTime plans to stick with its modified DOS 3.3 for now. Both remain compatible with older Apple computers, Softdisk recently adding compatibility with the original II as well as the II Plus.

Taking a step back, though, the magazines appear remarkably similar in terms of the concept of publication on disk. Both seem to be searching for an identity encompassing text columns and editorials and utility, educational, and entertainment programs. It seems obvious that their potential lies with the latter, in providing information best suited for computers and less effective or impossible through other media. While a paper magazine is a lot easier to carry or curl up with, it can't effectively animate a concept such as a bubble sort or illustrate and educate through interactive models.

A second area of unique contribution might be realized through a variety of add-on enhancements to popular software. Softdisk's inclusion of Print Shop images is a start, but how about graphics for other programs, spreadsheet templates for AppleWorks, or fonts for MultiScribe or MousePaint?

Perhaps the biggest challenge facing these publishers is support for different hardware platforms. As an Apple IIc owner, this was one of my greatest disappointments with both magazines: Double-hi-res graphics, mouse-controlled menus, and even 80-column text were nowhere to be found.

Overall, Softdisk and UpTime have both made admirable first steps into this new market segment, although both fall short of fulfilling the potential of disk-based publishing. At first I was skeptical about these products, but now I'm impatient for them to mature. In either case, I'm convinced that magazines on disk are here to stay.■

Jafar Nabkel
Fort Collins, CO

Five Ports, One Slot

SLOTBUSTER II

RC Systems Inc., 121 West Winesap Road, Bothell, WA 98012

Multifunction interface card; Apple II Plus, IIe, IIGS

$149.95 plus one or more options: serial port ($14.95), parallel port ($19.95), modem port ($29.95), BSR port ($29.95), speech synthesizer ($39.95), clock ($39.95)

Rating: ■■■■

RC Systems' original Slotbuster, a one-slot combination of serial and parallel ports and speech synthesizer, impressed me favorably when I reviewed it for the September 1985 *inCider* (p. 88). The new Slotbuster II, a similar intelligent interface card with its own Z80A microprocessor, supports a fourth and fifth input/output function—a modem port and BSR home control—along with a clock/calendar and a more-than-doubled on-board buffer. It still takes only one slot in your Apple II, with no "phantom slot" assignments to preempt your other boards. It's easy to operate, and provides almost everything you could want in a single card.

The standard Slotbuster II comes with 8K of buffer memory and no ports. Depending on your choices at order time, it arrives with printed and talking manuals, buffers of all sizes, and connectors of all sorts for any Centronics or serial printer, plotter, modem, or other device. Ports not ordered at first can be added later.

SETTING UP

Installation is simple—the old Slotbuster's DIP switches for settings such as serial baud rate or carriage return after line feed have been replaced by a nonvolatile-memory chip and a setup program on the utilities disk. After plugging the card into any slot except slot 3 or a II Plus' slot zero (Pascal and CP/M buffs must use slot 1), you just plug a small circuit board, connected to the Slotbuster by wire, into your Apple's game I/O connector. (Owners of the newest II should beware: The small arrow that points *toward* the IIe keyboard must point *away* from the GS keyboard.) The 16-pin game socket is reproduced on top of the Slotbuster plug, so you needn't abandon your joystick.

There are two versions of the setup program for power-on defaults: one with conventional keyboard menus, and a more sophisticated, mouse-driven, pull-down-menu program for the 128K enhanced IIe or IIGS. In addition, I liked the fact that you can override menu options with direct control-I keyboard commands, or send any control sequence directly to your printer.

With the help of keyboard commands or menus, you can select the mode in which the Slotbuster II will power up—serial, parallel, or BSR port or speech synthesizer. The serial port, parallel port, and synthesizer share an automatically allocated output buffer, expandable to 32K ($29.95) or 64K ($57.95). Since you can turn on the serial and parallel interfaces either separately or at the same time, the buffer lets you, for example, begin printing a file on your parallel printer, then simultaneously print another document on your serial machine.

You can use the Slotbuster II's voice synthesizer with any word-processing program, and have your work read aloud for proofreading. Simply enable the speech synthesizer, then print to the Slotbuster's port.

The control codes used to operate the Slotbuster II's serial and modem ports are nearly identical to those of the Apple Super Serial Card, while the parallel port mimics the Apple Parallel Card, making the Slotbuster II compatible with a wide base of off-the-shelf software. Both printer ports support graphics output for several popular printers.

A CHATTERBOX CARD

I found the Slotbuster II's voice syn-

thesizer an attractive feature, because it's an automatic text-to-speech system with an unlimited vocabulary. The card's text-to-speech algorithm groups the incoming character stream into basic word sounds (phonemes), routing them to the voice chip. The chip then turns the phonemes into robotic-sounding speech. By and large, the Slotbuster II's chip and algorithm work efficiently and cleanly, although its voice is rather metallic.

If you want to make your programs talk, the Slotbuster II is for you because it works just like a printer, except that this printer can read your work aloud. All you have to do is type PR#*n* at the keyboard, or from within your BASIC program, to turn on the Slotbuster's voice. The text-to-speech algorithm will then intercept all Applesoft PRINT statements and speak them aloud, while sending them to the screen or printer. The voice synthesizer, which uses the same 64K maximum buffer as the printer ports, can also speak all Applesoft and DOS error messages, adding greatly to its basic utility.

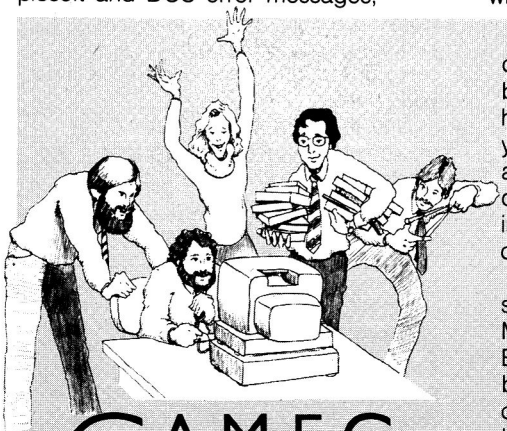
The Slotbuster II's ROM-based speech rules give it impressive flexibility, needing no disk-based software or memory overhead to work with ProDOS, DOS 3.3, Pascal 1.1, CP/M, and both forms of Apple BASIC. The synthesizer is also compatible with the Infocom line of text adventure games.

Compared to other speech synthesizers with which I've worked, such as Street Electronics' Echo Plus and Cricket and Sweet Micro Systems' Mockingboard, the Slotbuster II holds its ground in some areas, but lags in others. Dedicated speech units, naturally, can't match the Slotbuster's ability to control so many peripherals, but their voice chips are less primitive. The Slotbuster has a booming voice, mixed with a lot of "wow and flutter."

When I compared the speech quality of the Slotbuster II to those of the Votrax, Mockingboard, and Echo Plus, the card finished in the middle of the field: Its speech quality is better than the Votrax's and on a par with the Mockingboard's, but not as crisp as that of the Echo. The card does, however, give you good control over its speech center.

You can change the Slotbuster II's speech speed, pitch, and frequency, and alternate between whole-word and letter modes. I liked its Silence command, which lets you instantly shut off the voice without disturbing a running program, with a simple Control-I-R command. If you're going to use the Slotbuster II's synthesizer for applications for the blind, you'll find the ability to selectively turn off speech very helpful, letting you save time on long-winded menus and text.

RC Systems has developed two software packages to take advantage of the Slotbuster's speech. SpeechWorks, supplied free on the utilities disk, can give a voice to AppleWorks' spreadsheet, database, or word processor, adding greatly to the accuracy of data-entry operators. Blind users can get full voice access to the computer with the optional SCAT (Screen Articulator) program ($19.95). SCAT works with Applesoft and most



GAMES EDITORS PLAY

On Friday afternoons, AppleWorks fades from our office screens. We balked at letting Scott Mace have all the fun—hence, this bimonthly roundup.

Paul Statt plays...

Lords of Conquest, *Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, $39.95.*

I don't often win at chess, either. Lords of Conquest is like Risk on the computer. It's easier than board Risk because you don't have to add up your strengths and your opponents' weaknesses; the action is more strategic, with weapons and natural resources equally important. It's also more sophisticated, with customized maps.

Lords of Conquest is a much smaller (and older) game than Mindscape's Balance of Power. But it's like that game in that it's a bit intellectual—no ignorant armies clashing by night, no dogs of war, but lots of years passing up combat to stockpile resources. Lords of Conquest is for fans of Kissinger, not Rambo.

I played against the computer and lost—always. The Apple, I think, has an unfair advantage: It knows all about the lands you control, but you need the patience of the CIA to go into each of its territories and spy around. The graphics—maps and icons—are awful. I couldn't tell what was mapped on screen.

Lords of Conquest is fun. If Electronic Arts cuts its price a little—say, by $10 or $15—it'll be worth it.

Eric Grevstad plays...

The Rocky Horror Show, *Electric Dreams/Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043, $34.95.*

Goldfinger, *Mindscape Inc., 3444 Dundee Road, Northbrook, IL 60062, $39.95.*

Before MTV made decadence boring, *The Rocky Horror Show* made it cheerful, kinky fun. Electric Dreams' software version, imported from England by Activision, has some of the high spirits of the stage and film cult classic, almost enough to offset being slow-paced and frustrating.

After a sensational opening screen, with lightning playing over Dr. Frank N. Furter's castle to a rocking rendition of the famous *Time Warp* song, you choose your character, stalwart Brad or wholesome Janet. You use the joystick to wander weird rooms, collecting keys and pieces of the De-Medusa Machine that will rescue your petrified sweetheart and let you escape before time runs out.

BASIC programs, and can read and reread the screen.

All in all, the speech subsystem is cleanly implemented, allowing for lots of flexibility. I liked all its features, and was even more impressed by the number of software companies, such as Raised Dot Computing and Computer Aids Corporation, that are supporting the Slotbuster II with their talking software.

LIFE BY WIRELESS

If you own a BSR X-10 command console, the Slotbuster II's optional BSR remote-control port lets you run room lights, small appliances, or other electronic equipment from your Apple's keyboard. Teamed with the card's speech and clock options, it offers you an automatic, talking home.

The BSR port can operate at a distance of up to 15 feet from the command console. Activated in exactly the same way the printer ports and synthesizer are, using the Control-I-3O "change port" command, you can use it simultaneously with all other Slotbuster II ports without interfering with them. Commands are sent from your Apple to the command console by printing code-letter combinations (a different control code for each button on the console) to the BSR port. A 256-command buffer lets you type a long string of BSR commands, then switch to another port, or write a program to control your lights and appliances when you're not home.

CONVERSATION AND DOCUMENTATION

The Slotbuster II card comes bundled with a ProDOS disk full of useful utilities. You don't need the utility disk to operate the serial or parallel ports or make the synthesizer speak, but it does extend the useful applications.

Besides the two versions of the setup program, there are a Spanish-pronunciation rule table, an auxiliary rule table for generating custom speech rules, a speech-rule-table loader and compiler, an extensive speech tutorial, several talking games, a self test, and a graphics-dump utility. The utility programs supplement the manual, showing how to control the board from within BASIC programs.

The manual itself is very complete, offering many examples. I was impressed with RC Systems' documentation, and the company's willingness to supply text files of the manual on disk (helpful to vision-impaired users). The firm also offers a combination of the SCAT program and a talking manual ($34.95). This menu-driven verbal assistant is very helpful for blind users or anyone interested in speech synthesis.

Overall, the Slotbuster II is a fine upgrade to a good original. The serial and parallel ports and the ample buffer work perfectly; the speech synthesizer offers clear if robotic sound quality and a high degree of software compatibility; and the addition of a clock, modem port, and BSR port make the card complete.■

Joseph J. Lazzaro
Watertown, MA

Trouble is, the place is full of vile Transylvanians—the mad doctor, Riff Raff, and the gang—who quote song lyrics, steal your clothes (rendering you unable to continue, prey to taunts until you find them), or simply kill you. Dodging pranksters and laser beams gets nerve-racking, particularly since they're apt to nab you when you could swear you were out of range.

The graphics screens are average to good, but the playing concept is about as exciting as unloading groceries—you can carry only one key and one machine part at a time. Still, The Rocky Horror Show is tricky enough to keep you trying. For every time you're unfairly ambushed between screens, there's an exhilarating escape—or, as *Time Warp* says, just a jump to the left.

Mindscape's Angelsoft interactive-fiction lineup is getting better. Goldfinger, the firm's second James Bond adventure, is an improvement on last year's A View to a Kill—no great feat, since the latter was the most god-awful 007 movie ever.

Goldfinger has a lot in common with other Mindscape stories, from Rambo and Dick Francis to Indiana Jones: the same generic documentation, slow loading or reloading, a severe trap or puzzle near the beginning to frustrate beginners, and decent command- and dialogue handling, albeit with an occasional bug. Nevertheless, I'm happy to relive 007's greatest case, dodging the deadly Oddjob or driving the armored Aston Martin through a wild mountain chase. The Angelsoft programs rarely live up to their famous characters, but Bond buffs will enjoy this one.

Dan Muse plays...

HardBall!, *Accolade Entertainment Software, 20863 Stevens Creek Boulevard, Cupertino, CA 95014, $34.95.*

I admit it. I love working for *inCider*, but I'd rather be playing center field for the Boston Red Sox. I'm a baseball junkie, so when HardBall! crossed my desk, how could I resist?

HardBall! does have its flaws and quirks. For example, it'd be nice to use real teams instead of the two fictitious teams the game offers. It seems just about impossible to steal a base, too. But HardBall!'s strengths largely overshadow its minor shortcomings. For instance, you view impressive three-dimensional graphics from behind the pitcher's mound. For more of an overview, there's an inset in the bottom right-hand corner of the screen that shows the whole field.

You can play against either a human opponent or the computer. Be warned: Your Apple shows no mercy. Hitting against the computer is like trying to hit a Nolan Ryan fastball.

The pitchers do become tired and easier to hit in later innings. If you're lucky, you can take advantage of that before your opponent brings in a relief pitcher.

Against a human opponent, you can guess the location of the next pitch by paying close attention to the catcher's mitt. That's cheating, you say? Listen, in this game the batter needs all the help he can get.

After a couple of months of heavy HardBall!, I still haven't gotten my fill. The game requires good reflexes, good judgment, good guesswork, and a little luck—just like real baseball.■

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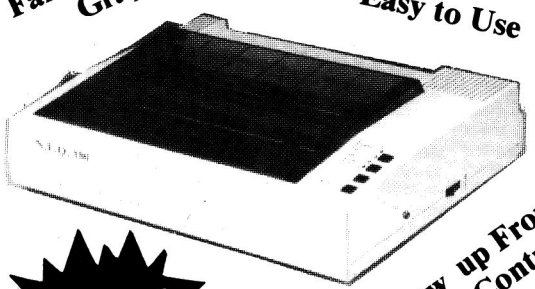

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Text Mode — Bi-directional
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Interface
Centronics type parallel (8-bit)
Paper
Plain paper, Roll paper, Single sheet
Fanfold, Multipart paper: max. 3 sheets (original plus 2 copies)
Character Fonts
Pica, Elite, Italics, Condensed

Printing Method
Impact dot matrix
Printing Speed
160-180 CPS at standard character printing
Printing Characters
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NLQ 12 x 18 dot matrix (33cps)
Character size: 2.12 x 2.8 mm (standard)
Character sets: Full ASCII character set (96)
32 International characters

Ink Ribbon Cartridge
Ribbon Life: 3 million characters/cartridge
Physical Dimensions
Size: 15" x 12" x 5"
Weight: 12.7 lbs.
Maximum Number of Characters

Standard:	10 cpi	80 cpl
Standard enlarged:	5 cpi	40 cpl
Elite:	12 cpi	96 cpl
Elite enlarged:	6 cpi	48 cpl
Condensed:	17 cpi	132 cpl
Condensed enlarged:	8.5 cpi	66 cpl
Condensed elite:	20 cpi	160 cpl

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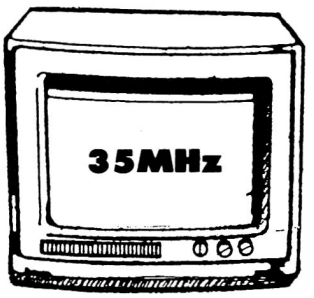

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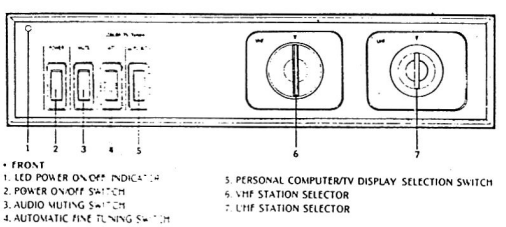

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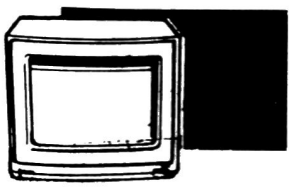

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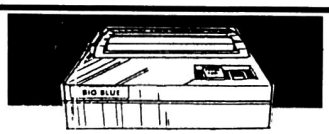

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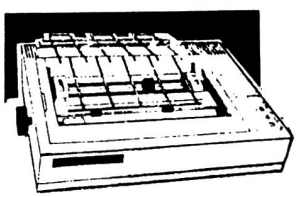

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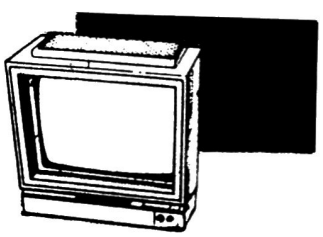

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Another version of Stamps is available for collectors of United Nations issues. You can examine either program by ordering the demonstration preview pack, which lets you enter up to 25 stamp records and test the program's capabilities. The preview pack is priced at $15 plus shipping and handling, while the full Stamps package is $95 plus $1.75 shipping, from Compu-Quote, 6914 Berquist Avenue, Canoga Park, CA 91307, (818) 348-3662. There's no need to put a stamp on the Reader Service card, but you'll have to circle number 353 for more information.

Go exploring in the land of Varn, but beware of the 3-D monsters in Might and Magic.

FUN FOR KIDS

The KidsTime II package, designed for children ages three to ten, contains two **educational programs for the IIgs**. ABKey is a letter-recognition and keyboard-skill program with different speeds and levels of difficulty, in which kids press the corresponding key to identify upper- or lowercase letters or the first letter of a word shown as a picture. KidsNotes lets children explore different aspects of music, experimenting with pitch, tempo, volume, and simple time and key signatures. The complete KidsTime II package sells for $39.95, from Great Wave Software, 104 Gilbert Avenue, Menlo Park, CA 94025, (415) 325-2202. Circle Reader Service number 354 for more information.

MONSTERS, MYTHS, AND MAGIC

Explore the land of Varn in Might and Magic, the first in a series of **fantasy role-playing** games. In Book One: The Secret of the Inner Sanctum, you assemble your party of up to six adventurers to cross oceans, climb mountains, and search through castles and dungeons. You'll encounter more than 200 monsters of various descriptions and abilities, but you'll have more than 250 magic items and 94 different spells to help you out. The game features three-dimensional color perspective and flicker-free instant graphics, as well as a full-color map of Varn for off-screen study. The premier volume of Might and Magic costs $54.95, from New World Computing, P.O. Box 491415, Los Angeles, CA 90049, (213) 659-1888. You can circle Reader Service number 356 for more information, but you'll have to do more than that to find the secret of the Inner Sanctum.

THE TAXMAN

Get ready to file under the new tax law with Tax Reform Analyzer. This set of **worksheet tax templates** for leading spreadsheet programs, including AppleWorks, SuperCalc, and Multiplan, answers your questions, such as how the new law will help or hurt you, what your tax bills for 1986, 1987, and 1988 will be, what you can do to cut your taxes, and how to change your withholding to avoid IRS penalties, with dollar estimates and specific recommendations. Graphing utilities are included. Tax Reform Analyzer sells for $29, from Intuit, 540 University Avenue, Palo Alto, CA 94301, (415) 322-0573. As an introductory offer, Intuit is offering the program free to customers who purchase its financial-management package, Quicken, before April 15, 1987. For more information, circle Reader Service number 364.

Philatelists can get organized with the Stamps database package for either U.S. or U.N. issues.

Hardware

INTELLIGENCE AND MEMORY

Orange Micro has two new peripherals for the Apple IIGS—the ProGrappler and the RamPak 4GS. The ProGrappler, an **intelligent parallel interface**, maintains Grappler Plus and Apple II Plus and IIe compatibility, but incorporates new features, some exclusive for the GS. Besides providing all the hardware necessary to connect most popular printers to your Apple, the ProGrappler supplies flexible options for printing text or graphics directly from your screen, including inverted and rotated graphics, graphics windowing, enlargement, and hi-res or super-hi-res printing. GS users can access ProGrappler's functions through the pull-down Desk Accessory menu.

The RamPak 4GS **memory card** provides a standard 512K you can expand in 256K increments to 4 megabytes. Memory is self-configuring, so no switch settings or jumpers need be changed. The card features utilities for RAM caching, diagnostics, and dynamic memory allocation. The ProGrappler sells for $119 and the RamPak 4GS for $259 (with 512K). For more information, contact Orange Micro at 1400 North Lakeview Avenue, Anaheim, CA 92807, (714) 779-2772, or circle Reader Service number 359.

The ProGrappler intelligent parallel interface includes options for inverted, rotated, enlarged, and super-hi-res graphics printing.

The RamPak 4GS expansion card features RAM caching and dynamic memory allocation.

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The trackball rests atop the Turbo Mouse for easier desktop operation.

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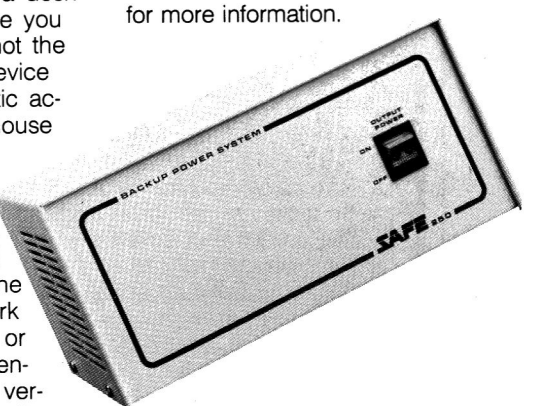

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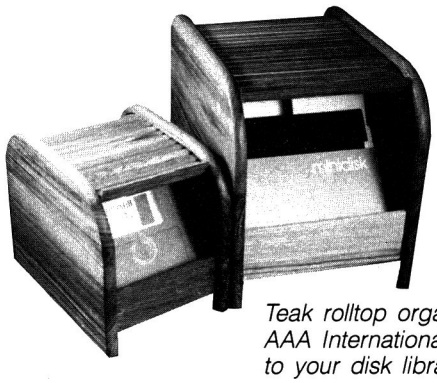

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● **Spectrum**, the home-banking and information service of the Chase Manhattan Bank, has expanded its capabilities. Subscribers can now upload and download data from the system to use with Managing Your Money software. Chase has also developed a version of Spectrum to serve the needs of small businesses and made the service available to Macintosh users. Contact the Chase Manhattan Bank's Public Affairs Division at One Chase Manhattan Plaza, New York, NY 10081, (212) 552-4507, for more details.

power source sells for $97.95, from Powersine Products, P.O. Box 16887, San Diego, CA 92116. For more information, circle Reader Service number 358.

Resources

MUSIC TO THE EARS

Musicians can find detailed descriptions of currently available **music software** in the *Musician's Music Software Catalog,* including patch editors and librarians, sequencers, transcribers, and MIDI devices. Screen images or music transcriptions accompany the descriptions. Popular music programs such as Personal Composer, Sound Designer, and Deluxe Music Construction Set are all included. Find your next accompanist in the *Musician's Music Software Catalog* for $2 from Scherzando Music, Department PR, P.O. Box 3438, Milford, CT 06460, (203) 874-5343. For more information, circle Reader Service number 362.

SOFTWARE HERE

Need to know what's available for your Apple II? The 1987 edition of the *Apple II and IIGS Guide* offers an up-to-date **listing of more than 10,000 software packages** available for the Apple II family (all existing—no vaporware), with coupons redeemable for the purchase of software. Information in the guide comes from the publisher's extensive database, which includes notes on more than 75,000 software packages, edited daily with new-product and revision updates. The *1987 Apple II and IIGS Guide* sells for $9.95, refundable with your first purchase, from The Menu, 1520 South College Avenue, Fort Collins, CO 80524. Order by calling (800) THE-MENU, or circle Reader Service number 363 for more information.

Updates

● Reader Rabbit, The Learning Company's reading tutor, has learned to talk in a new version that takes advantage of the Apple IIGS' sound capabilities as well as offering brighter graphics and animation. The silent version of Reader Rabbit, as well as Writer Rabbit and Math Rabbit, are still available for the II Plus, IIe, and IIc. **Talking Reader Rabbit** retails for $49.95. Talk to The Learning Company at 545 Middlefield Road, Suite 170, Menlo Park, CA 94025, (415) 328-5410.

● Even if you don't subscribe to Spectrum, there's even more reason to try **Managing Your Money** now. MECA has released a faster, enhanced version of the popular program, featuring accounts payable and receivable with aging, five-year budgeting, tax forecasting, buy-versus-lease comparisons, mortgage refinancing, planning for a child's college education, invoice printing, and a card file to generate mailing lists and print mailing labels. The new version also supports the UniDisk 3.5, hard disks, and RAM cards. Its suggested retail price is $199.95. Contact MECA for details at 285 Riverside Avenue, Westport, CT 06880, (203) 222-1000.

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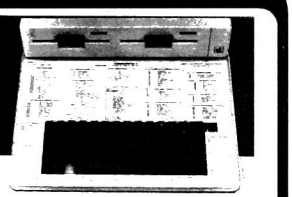

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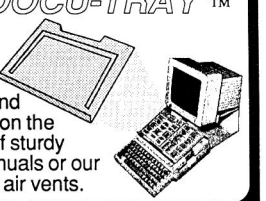

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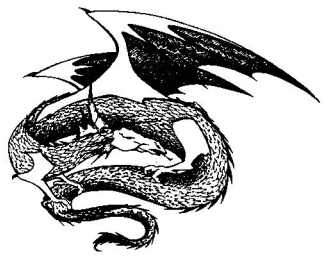

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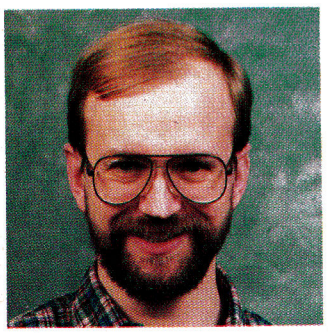
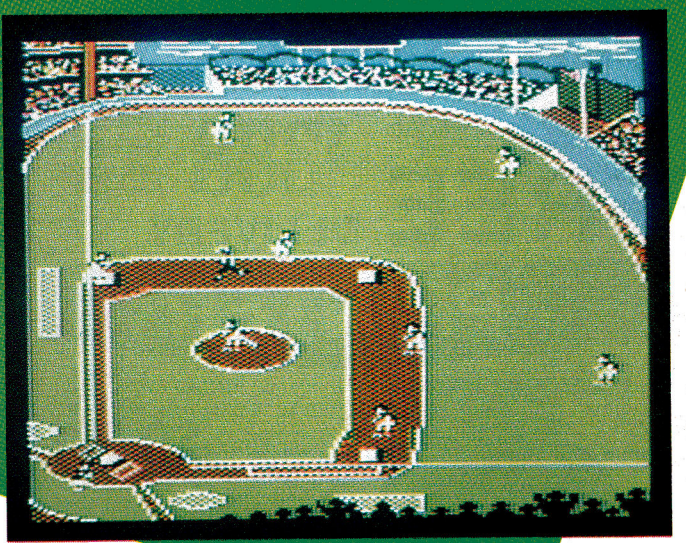


"Baseball simulations bring statistics to life."

by Scott Mace

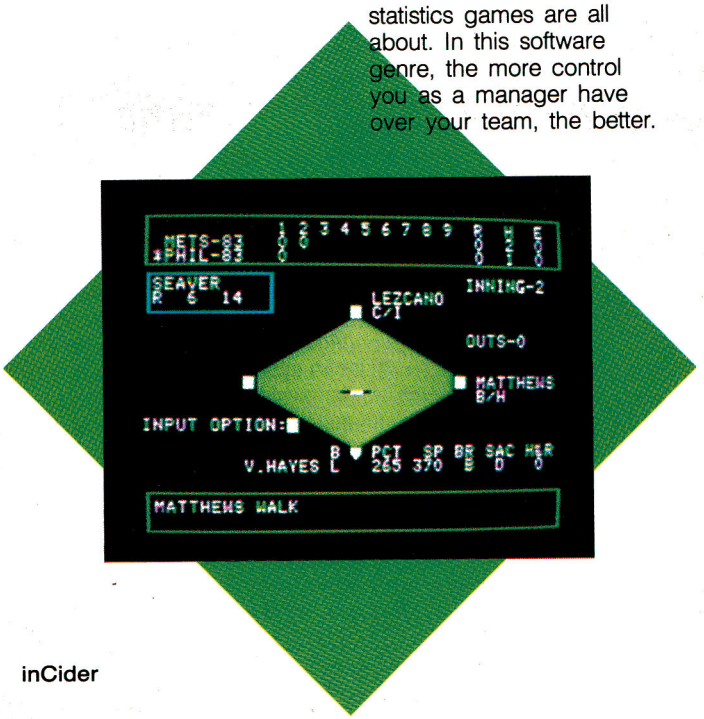


For years, sportswriters and fans have been second-guessing baseball managers. But they never had a way to live out their baseball fantasies and try their hand at managing—until baseball and computers teamed up.

The combination of major-league baseball and the personal computer was inevitable. Professional teams store scouting reports on personal computers (see "The Tenth Player," July 1986, p. 42), and now Apple II owners can choose from a wide range of baseball simulations.

Baseball simulations bring statistics to life. For example, if Rod Carew batted .400 one year, the simulation should give him four hits for every ten at-bats against any team from that same year. But, as in the real game, a lot depends on the ability of the manager—and the opposing pitcher.

And that's what baseball-statistics games are all about. In this software genre, the more control you as a manager have over your team, the better.



GENERATIONS OF BASEBALL

Typical of first-generation baseball-statistics games is **Statis Pro Baseball**, from Avalon Hill Microcomputer Games (4517 Harford Road, Baltimore, MD 21214, $35). Disks containing rosters of the teams that played in a particular season are available, covering a number of years. As in most first-generation baseball simulations, the diamond in Statis Pro Baseball is fairly crude text and line art.

Micro League Baseball, from the Micro League Sports Association (2201 Drummond Plaza, Newark, DE 19711, $39.95), represents the second generation of the genre. Micro League Baseball has the best look and feel of any baseball simulation. The ballpark is displayed in vivid color, with players trotting around the field making plays, and lively radio-style play-by-play text scrolling smoothly by at the top of the screen. Additional plays, such as base-stealing, are included.

I liked the way Statis Pro lists the names of the on-base runners next to their locations, a feature lacking in the other two games mentioned in this column. Micro League Baseball concentrates on providing information on the diamond screen, such as the names of the batters at bat and on deck, and who's pitching.

As with Statis Pro Baseball, you can purchase additional teams on disk, here either season-by-season, or according to franchise history, which gives you the full player rosters of ten selected years of that franchise.

Pure-Stat Baseball, from SubLogic Corp. (713 Edgebrook Drive, Champaign, IL 61820, $49.95), is the newest baseball simulation. Like Micro League Baseball, Pure-Stat Baseball lets you play against the computer or other baseball fanatics.

Pure-Stat Baseball discards some of the admittedly unnecessary touches Micro League Baseball uses, such as crowd noise and the national anthem, apparently to fit more information onto the master

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MACE ON GAMES

disks. Here, you not only play ball, but can update and create statistics disks, entering data on each team member from the games you play. In addition, Pure-Stat Baseball includes a "trade players" function, a $40 option for Micro League Baseball.

PLAYING OPTIONS

In fact, few other computer-game genres make it possible for you to spend this kind of money on optional disks. For instance, Pure-Stat Baseball was the only one of the three simulations to offer a choice of ballparks. On the disk are Yankee Stadium, Dodger Stadium, and a fantasy SubLogic stadium.

But wait—there's more! Act now and you can get the Pure-Stat Stadium Disk. The sky—and your pocketbook—are the limit.

Each simulation has a flotilla of batters' stats. In Micro League Baseball, you can review hitters' batting averages, home runs, RBIs, at-bats, hits, strikeouts, bases. Pure-Stat Baseball adds fielding percentage and some impure stats: numerical ratings of each batter's throwing ability, range (ability to run while fielding a ball), base-running ability, sacrifice-bunting ability, and power rating, giving highly rated players a better shot at hitting a home run.

Pure-Stat Baseball also pays more attention to that most nettlesome of a manager's problems, the pitching staff. First, it establishes a rotation of pitchers, either four-day or five-day, with a different game of Pure-Stat Baseball for each day if you choose to play a series of games. Second, you have the option of deciding when to warm up relief pitchers. If you give a relief pitcher either too much or not enough warmup time, he gives up more hits when he gets to the mound.

Micro League Baseball offers the expected pitchers' stats: win-loss record, earned-run average, innings pitched, complete games, saves, and their batting stats. Pure-Stat Baseball adds a tiring factor, another "soft" stat that's based, like all of them, on observations that are useful to managers, but unnecessary for understanding the box score in the newspaper.

So which one should you buy? Statis Pro Baseball offers a few features the others don't, but lacks much of the others' managerial finesse. Plentiful yearly stat disks of all major-league teams may point you toward the Avalon Hill system.

Micro League Baseball and Pure-Stat Baseball are clearly second-generation systems and offer more variables than first-generation packages. They're also supported by newsletters and user organizations around the country. For the novice, I recommend Micro League Baseball. I prefer the on-screen data to the SubLogic system, in which all data, including the play-by-play of the last play you see acted out on a computer-graphics-generated diamond, are gathered onto one text screen.

But Pure-Stat Baseball adds the "soft" statistics that can make or break a great team and really test your mettle as a manager. Purists might not want to deal with these "soft" statistics, and I suppose they can just ignore them. As I warned, though, be prepared to spend a little more money than usual, because with those optional libraries, you can expand your baseball fantasies as far as you want to take them. ■

Write to Scott Mace at 6510 Copper Ridge Drive #T-1, Baltimore, MD 21209.

HINTS/TECHNIQUES

Apple users know that there's always an easier way to get the job done. A shortcut here, an elegant twist there. That's what Hints/Techniques is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night. See pp. 112 and 114 in this issue for data strips accompanying programs in this section.

Fast Screen Printing

by Brian L. Zimmerman

The screen-dump utility presented here shows how to use two firmware routines, MOVE and MOVEAUX, to move your 40- or 80-column screen image (screen locations represented by blocks of memory) to a "safe" place in memory, where you can later retrieve it as a single block (including spaces) for printing.

Listing 1 is a preboot program for loading your program into memory starting at location 4096 instead of the usual page 2 location (2048), reserving 2K of memory between 2048 and 4096 for saving your screen. (See the *Applesoft BASIC Programming Reference Manual* for other examples.)

First type in **Listing 1** and save it under the name of the program you're using with the screen-dump utility. Before you save it, though, change line 40 to include the name of your program with the suffix .2 appended to it as shown. You'll use this modified name to save **Listing 2**, which contains the screen-dump utilities and should be typed in with your program.

You may omit the remark statements in lines 10–80, but you must include the line GET K$: GOSUB 100 in your program, wherever you'd like to have the screen-print option. Pressing the open apple-P key combination activates the screen-dump subroutine, which first prompts you to make sure your printer is on, and lets you cancel the command if you decide not to print. The screen-dump program returns control to your BASIC program,

Listing 1. Preboot program.

```
10  POKE 103,1
20  POKE 104,16
30  POKE 4096,0
40  PRINT  CHR$ (4);"RUN YOUR.PROGRAM.2"
```

Listing 2. Fast screen-dump utility.

```
10  REM   ENTER YOUR PROGRAM AND LINES 100-910 BELOW.
20  REM   SAVE THIS FILE WITH NAME FROM LINE 40, LISTING 1
30  REM   INCLUDE THE FOLLOWING LINE IN YOUR PROGRAM WHERE YO
     U WANT TO PRINT THE CURRENT SCREEN.
40  GET K$: GOSUB 100
50  REM   THE SCREEN DUMP WILL THEN BE PERFORMED IF OPEN-APPL
     E-P KEYS ARE PRESSED.
60  REM   IMPORTANT! -SEE LINE 850- YOU MAY NEED TO ADD A PRI
     NT STATEMENT THERE DEPENDING UPON YOUR PRINTER.
70  REM   IF YOU CHANGE THE LINE NUMBERS YOU WILL HAVE TO CHA
     NGE ALL GOTO & GOSUB REFERENCES IN LINES 150, 180, 240,
     250, 260, 300, 540, 620, 630, 640, 680, 690, 700, 710, 7
     40, & ALSO LINE 40 ABOVE.
80  REM   YOU MAY ALSO CHANGE LINES 340 & 430 IF YOU DON'T WA
     NT 40-COL PRINTOUTS CENTERED ON THE PAGE.
100  REM   ================
110  REM     SCREEN DUMP
120  REM   ================
130 D$ =  CHR$ (4):ESC$ =  CHR$ (27):RET$ =  CHR$ (13)
140  REM   CHECK IF OPEN-APPLE-P IS PRESSED
150  IF (K$ = "P" OR K$ = "p") AND  PEEK (49249) > 127 THEN 1
     70
160  RETURN
170 COL =  PEEK (49183): REM   CHECK FOR 80 COLS
180  IF COL > 127 THEN 570: REM   IF 80-COLS ON THEN DO
     80-COL ROUTINE
190  REM   ===============
200  REM     40-COL DUMP
210  REM   ===============
220  REM    FIRST SAVE SCREEN
230  REM    MOVE FROM PAGE1 TO PAGE2
240 N = 1024:LOC = 60: GOSUB 270: REM   OLD START ADDRESS
250 N = 2039:LOC = 62: GOSUB 270: REM   OLD END ADDRESS
260 N = 2048:LOC = 66: GOSUB 270: GOSUB 280: GOTO 290: REM
     NEW START ADDRESS
270  POKE LOC,N -  INT (N / 256) * 256: POKE LOC + 1, INT (N /
     256): RETURN : REM   INSTALL 'MOVE TO/FROM' ADDRESSES FO
     R USE BY ROM
280  POKE 768,160: POKE 769,0: POKE 770,76: POKE 771,44: POKE
     772,254: CALL 768: RETURN : REM   INSTALL MACHINE LANG R
     OUTINE THAT RUNS ROM 'MOVE' PROGRAM
290  REM   PRINT SCREEN FROM PAGE2
300  GOSUB 490
310  IF I$ = ESC$ THEN  RETURN
320  PRINT D$;"PR#1"
330  PRINT
340  PRINT "                         ";: REM   20 SPACES CENTERS 4
     0-COLS ON PAGE
350  FOR SEC = 0 TO 80 STEP 40
360  FOR ROW = 0 TO 896 STEP 128
370  FOR COL = 2048 TO 2087
380 X =  PEEK (SEC + ROW + COL)
```

```
390  IF X < 32 THEN X = X + 64
400  PRINT  CHR$ (X);
410  NEXT COL
420  PRINT
430  PRINT "                    ";: REM   20 SPACES
440  NEXT ROW
450  NEXT SEC
460  PRINT
470  PRINT D$;"PR#0"
480  RETURN
490  REM   TURN ON PRINTER PROMPT
500  HOME : VTAB 8: PRINT "PLEASE MAKE SURE YOUR PRINTER IS R
     EADY."
510  VTAB 12: HTAB 8: PRINT "Press ";: INVERSE : PRINT "<RETU
     RN>";: NORMAL : PRINT " to Print"
520  VTAB 14: HTAB 11: PRINT "(<ESC> to Cancel)"
530  VTAB 12: HTAB 32: GET I$
540  IF I$ <  > RET$ AND I$ <  > ESC$ THEN 500
550  RETURN
560  REM   =================
570  REM      80-COL DUMP
580  REM   =================
590  REM    SAVE 80-COL SCREEN
600  REM    MOVE EVEN COLS FROM AUX RAM PAGE1X TO MAIN RAM PA
     GE'3'
610  POKE 49237,0: REM   TURN PAGE2 SWITCH ON FOR AUX RAM
620 N = 1024:LOC = 60: GOSUB 270: REM   OLD START ADD
630 N = 2039:LOC = 62: GOSUB 270: REM   OLD END ADD
640 N = 3072:LOC = 66: GOSUB 270: REM   NEW START ADD
650  POKE 768,24: POKE 769,76: POKE 770,17: POKE 771,195: CALL
     768: REM   INSTALL MACHINE LANG ROUTINE THAT RUNS ROM 'M
     OVEAUX' PROGRAM WITH CARRY BIT CLEAR (AUX>MAIN)
660  REM   MOVE ODD COLS FROM PAGE1 TO PAGE2 MAIN RAM (2048-3
     063)
670  POKE 49236,0: REM   TURN PAGE2 SWITCH OFF FOR MAIN RAM
680 N = 1024:LOC = 60: GOSUB 270: REM   OLD START ADD
690 N = 2039:LOC = 62: GOSUB 270: REM   OLD END ADD
700 N = 2048:LOC = 66: GOSUB 270: REM   NEW START ADD
710  GOSUB 280
720  REM   PRINT SCREEN
730  PRINT  CHR$ (21): REM  TURN OFF 80-COL CARD
740  GOSUB 490
750  IF I$ = ESC$ THEN  RETURN
760  PRINT D$;"PR#1": PRINT
770  FOR SEC = 0 TO 80 STEP 40
780  FOR ROW = 0 TO 896 STEP 128
790  FOR COL = 1024 TO 1063
800 L = (SEC + ROW + COL)
810 CA =  PEEK (L + 2048): IF CA < 32 THEN CA = CA + 64
820  PRINT  CHR$ (CA);
830 CM =  PEEK (L + 1024): IF CM < 32 THEN CM = CM + 64
840  PRINT  CHR$ (CM);
850  NEXT COL
860  REM   A PRINT STATEMENT MAY BE NEEDED HERE IF YOUR PRINT
     ER/INTERFACE DOES NOT PRINT AUTOMATICALLY AFTER 80 CHARA
     CTERS OR IF A LINE FEED IS NOT GENERATED
870  NEXT ROW
880  NEXT SEC
890  PRINT
900  PRINT D$;"PR#0"
910  RETURN
```

but doesn't bring back its original screen display. To fix this, you can add a loop to return to your program's screen-display routine.

The program assumes that your printer is connected to slot 1 (PR#1) and that it performs a carriage return with a linefeed after every 80 characters. If this isn't the case, simply add a PRINT statement at line 860.

While there are other ways to print the screen, this one demonstrates several useful programming techniques. The 40-column screen, which normally resides at memory page 1 (locations 1024–2039), is moved to page 2 (2048–4063), where it won't be erased when the prompting message is placed on screen. The program PEEKs each screen location from page 2 in the proper order (using the nested FOR/NEXT loops in lines 350–450) to send each character, line by line, to the printer.

The numbers used to increment the FOR/NEXT loops are derived from the numbering scheme used to map the 40-column text display in memory. (See the *Apple IIc Reference Manual, Volume 1*). Lines 230–280 move memory by calling MOVE, one of the monitor-ROM-firmware routines, located at $FE2C. (See the *Apple IIc Reference Manual, Volume 2*, for firmware listings. Appendix C lists the entry points; Appendix I lists the source code.) The format for designating the starting and ending addresses used by the MOVE program is the same as that listed on the Beagle Bros wall chart.

The 80-column display uses two blocks of memory—one is the same 40-column display located at page 1, which now represents the odd-numbered columns; the other, a second 40-column display (page 1X), represents the even-numbered columns and uses locations 1024–2039 in the extended 80-column card's 64K auxiliary RAM.

To access this auxiliary bank, turn on the soft switch named PAGE2 (see line 610). The *Apple IIc Reference Manual, Volume 1*, describes how to use soft switches for switching display memory. The 80-column dump routine uses this switch to select page 1X so that it can be moved to "page 3" of main RAM (locations 3072–4087), the second 1K of the 2K reserved for the display. It also moves page 1 to page 2 in the same manner as the 40-column dump routine.

The program then re-creates the 80-column screen and sends it to the printer by alternately reading characters from page 3 (even columns) and page 2 (odd columns), as shown in lines 810–840. The Video Firmware routine, MOVEAUX (lines 620–650), moves auxiliary-memory page 1X to main-memory page 3. The carry-bit commands, issued in the machine-language routine, determine the move's direction. A clear carry-bit command causes the MOVEAUX program to copy memory from auxiliary RAM to main RAM, whereas a set

carry-bit command causes the MOVE-AUX program to copy in the opposite direction. (See the *Apple IIc Reference Manual, Volume 1*, for details.)

By the way, the program adds 64 to the ASCII-character code in lines 390, 810, and 830 so that inversely displayed characters won't be interpreted as the corresponding control characters, which would cause your printer to do strange things.■

Write to Brian Zimmerman at 14732 Esther Lane, Chester, VA 23831.

Muppet Learning Keys Reader

by Paul F. McMullin

By modifying your existing Applesoft programs you can increase your child's library of Muppet Learning Keys software. Putting the subroutines presented here (**Listing 3**) into a text file, then EXECing them into your program, lets your Apple read the Muppet keyboard. (Make sure the line numbers you use in the subroutines are available.)

Wherever your original program uses a keyboard command, such as GET X$, simply replace it with GOSUB 50, as in GOSUB 50:X$ = A$. You can also use the value returned in the variable A.

Listing 3. Muppet Learning Keys Reader.

```
=======================================
MUPPET LEARNING KEYS READER
     P.F.MCMULLIN

 5  DIM A$(20): DIM A(20):REM SETUP
 7  FOR N = 0 TO 20: READ A$(N): READ
    A(N): NEXT N
 8  DATA
    "!",33,"?",63,",",44,".",46," ",32,"
    ",32,"+",43,"-",45,"*",42,"/",47,"=",
    61,"ZAP",0,"ERASE",27,"UP",11,"DOWN",
    10,"LEFT",8,"RIGHT",21,"OOPS",27,"STO
    P",7,"GO",13,"HELP",63,
 10 HOME : GOTO 100

=======================================

 50 X =  INT ( PDL (0) / 11.5):Y =  INT (
    PDL (1) / 15): REM  READS LETTERS
    AND NUMBERS OR DISTRIBUTES TO THE
    OTHER SUBS
 51 IF X > 11 OR Y > 8 THEN 50
 52 A$ = "": FOR N = 1 TO 5:B =  PEEK
    (49200): NEXT N: IF (Y = 2 AND X <
    8) OR (X = 6 AND Y > 1 AND Y < 8)
    THEN A = 255: GOTO 59
 53 IF X < 7 THEN  IF Y = 8 OR (Y = 7
    AND X > 1) THEN  GOSUB 60: GOTO 59
 54 IF Y = 1 THEN  GOSUB 70: GOTO 59
 55 IF X > 6 AND Y > 1 THEN  GOSUB 80:
    GOTO 59
 56 IF Y = 0 AND X = 11 THEN A$ =
    A$(11):A = A(11): GOTO 59
 57 A = (Y * 6) + 47 + (Y = 0) + X: IF A
    < 48 OR A > 90 THEN A = 255: GOTO 59
 58 A$ =  CHR$ (A)
 59 RETURN

=======================================

 60 IF X > 6 THEN  GOSUB 80: GOTO 69:
    REM  READS PUNCTUATION,SIGNS
 61 IF Y = 7 THEN A$ = A$(X - 2):A = A(X
    - 2): GOTO 69
 62 A$ = A$(X + 4):A = A(X + 4)
 69 RETURN

=======================================

 70 IF X = 0 THEN A$ = "BLACK":A = 4:
    GOTO 79: REM     RETURNS COLORS
 71 IF X = 1 THEN A$ = "WHITE":A = 3:
    GOTO 79
 72 IF X = 2 THEN A$ = "RED":A = 7: GOTO
    79
 73 IF X = 3 THEN A$ = "ORANGE":A = 5:
    GOTO 79
 74 IF X = 4 THEN A$ = "YELLOW":A = 7:
    GOTO 79
 75 IF X = 5 THEN A$ = "GREEN":A = 1:
    GOTO 79
 76 IF X = 6 THEN A$ = "BLUE":A = 6:
    GOTO 79
 77 IF X = 7 THEN A$ = "VIOLET":A = 7:
    GOTO 79
 78 A$ = "":A = 255: IF X = 10 OR X = 11
    THEN A$ = A$(12):A = A(12)
 79 RETURN

=======================================

 80 IF Y > 4 THEN 86: REM   RETURNS
    SPECIAL KEYS
 81 IF Y = 2 THEN A$ = A$(13):A = A(13):
    GOTO 89
 82 IF Y = 4 THEN A$ = A$(14):A = A(14):
    GOTO 89
 83 IF Y = 3 AND X < 9 THEN A$ =
    A$(15):A = A(15): GOTO 89
 84 IF Y = 3 THEN A$ = A$(16):A = A(16):
    GOTO 89
 85 GOTO 89
 86 IF Y < 7 AND X < 9 THEN A$ =
    A$(17):A = A(17): GOTO 89
 87 IF Y < 7 THEN A$ = A$(18):A = A(18):
    GOTO 89
 88 A$ = A$(19):A = A(19): IF X < 9 THEN
    A$ = A$(20):A = A(20)
 89 RETURN

=======================================

 100  TEXT : HOME : HTAB 8: PRINT "*
    MUPPET LEARNING KEYS *": VTAB 4:
    HTAB 10: PRINT "KEYBOARD-READ
    DEMO.": VTAB 7: HTAB 5: PRINT
    "SUB-ROUTINES BY PAUL MC MULLIN":
    VTAB 9: HTAB 1: FOR N = 1 TO 40:
    PRINT "_";: NEXT N
 110  VTAB 12: HTAB 8: PRINT "PRESS ANY
    KEY TO BEGIN": POKE 35,24: POKE
    34,10
 120  GOSUB 50: HOME : PRINT "THE KEY
    WHICH WAS PRESSED RESULTED IN :":
    PRINT : PRINT  SPC( 12);"A$ = ";A$:
    PRINT : PRINT  SPC( 12);"A  = ";A:
    PRINT : PRINT  SPC( 12);"X  = ";X:
    PRINT : PRINT  SPC( 12);"Y  = ";Y:
    PRINT : PRINT "PRESS [ZAP] TO EXIT";
 130  IF A <  > 0 THEN 120
 140  HTAB 1: PRINT "TYPE 'RUN' TO
    CONTINUE";: TEXT : END
```


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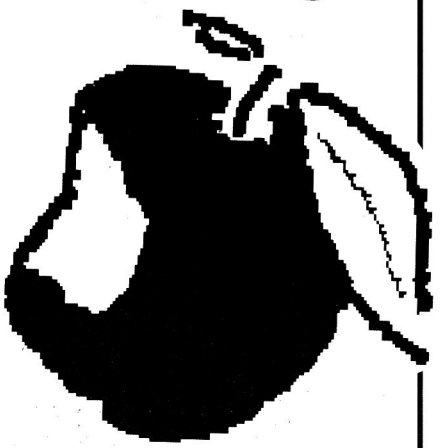

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HINTS/TECHNIQUES

The Muppet keyboard is connected to your Apple through the game port. Pressing a key causes a change in the resistance of paddle inputs zero and 1. Muppet Learning Keys Reader reads the paddle values and applies a mathematical formula to produce the grid reference of the key pressed (line 50): variables X (horizontal axis, zero to 11, left to right) and Y (vertical axis, zero to 8, bottom to top). The other subroutines translate the grid reference to identify the key pressed. An appropriate string character is returned in the variable A$, and a numerical representation in the variable A. For most keys, A$ will be the character and A its ASCII value.

For the Muppet color keys, A$ will hold the name of the color, and A the Applesoft high-resolution-graphics code number for that color (colors not available under HGR are given the code for white). Whenever a key isn't read successfully, the value returned in A is 255.

To use all Muppet Learning Keys, you'll need the setup (lines 5–8) and lines 50–89. If you don't need the color keys, you can eliminate lines 70–79 and remove the GOSUB instruction from line 54 as shown below:

```
54 IF Y = 1 THEN A = 255: GOTO 59
```

If you don't intend to use the punctuation keys, arithmetic signs, or spacebar, edit line 53 similarly and leave out lines 60–69. To eliminate the special keys (Go, Stop, Zap, and so on) and arrow keys, edit line 55 and remove lines 80–89.

Note that when using the Muppet keyboard with both modified programs and the software supplied with the device, you don't always get on screen the character you intended—this keyboard isn't meant for high-volume word processing. If you're familiar with programming, you may want to include some error-checking features for keys that have drastic effects—require such a key be pressed twice to confirm it, for example.■

Write to Paul McMullin at Rua Monte Aprazivel, No. 935, Apt. 32, Campinas, SP, CEP 13100, Brazil.

HELLO Password

by Orlando Fernando

The short HELLO program presented here (see **Listing 4**) protects your disks from the curious by requiring the user to type in the correct password before cataloging the disk.

To use it, type in **Listing 4**, entering your password in A$ (line 20). Be sure to save it to disk before you run it. When the program runs, the computer prompts you to type in a password, which doesn't appear on screen as you type. If you correctly enter the password, the computer catalogs the disk and you're admitted into BASIC.

If, however, you misspell the password or press Control-C or Control-Reset, you won't be admitted and the disk will reboot. If you've engaged DOS with another disk, though, your password-protected disk can be accessed the standard way. Use a write-protect tab for complete protection.■

Write to Orlando Fernando at 64-5 Hope Street, Stamford, CT 06906.

Listing 4. Password HELLO program.

```
10  ONERR  GOTO 100
20 A$ = "PASSWORD"
30  POKE 1012,0:DG = 1
40  HOME : PRINT "PASSWORD:";
50  GET KEY$
60  IF  MID$ (A$,DG,1) <  > KEY$ THEN  GOTO 100
70 DG = DG + 1: IF DG =  LEN (A$) + 1 THEN  PRINT "WELCOME": CALL
     42350: NEW
80  GOTO 40
100  CALL 50688
```

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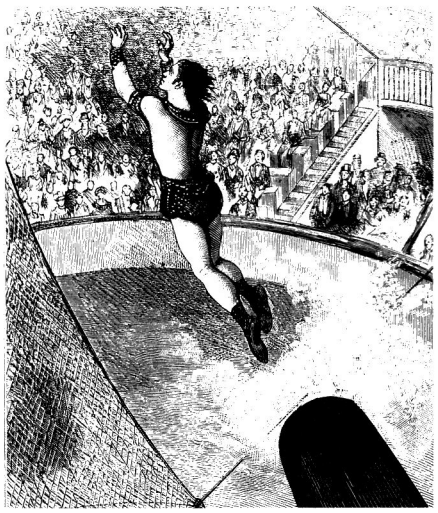

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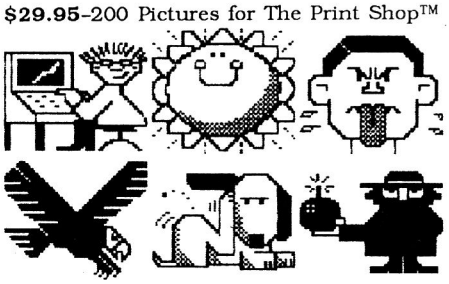

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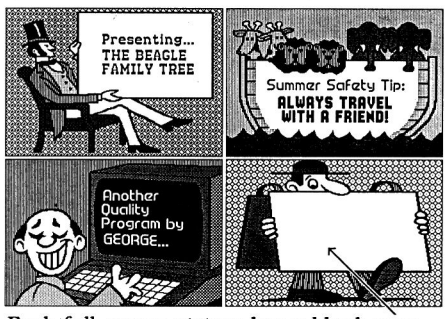

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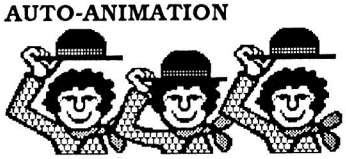

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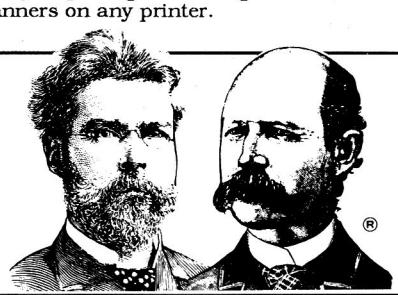

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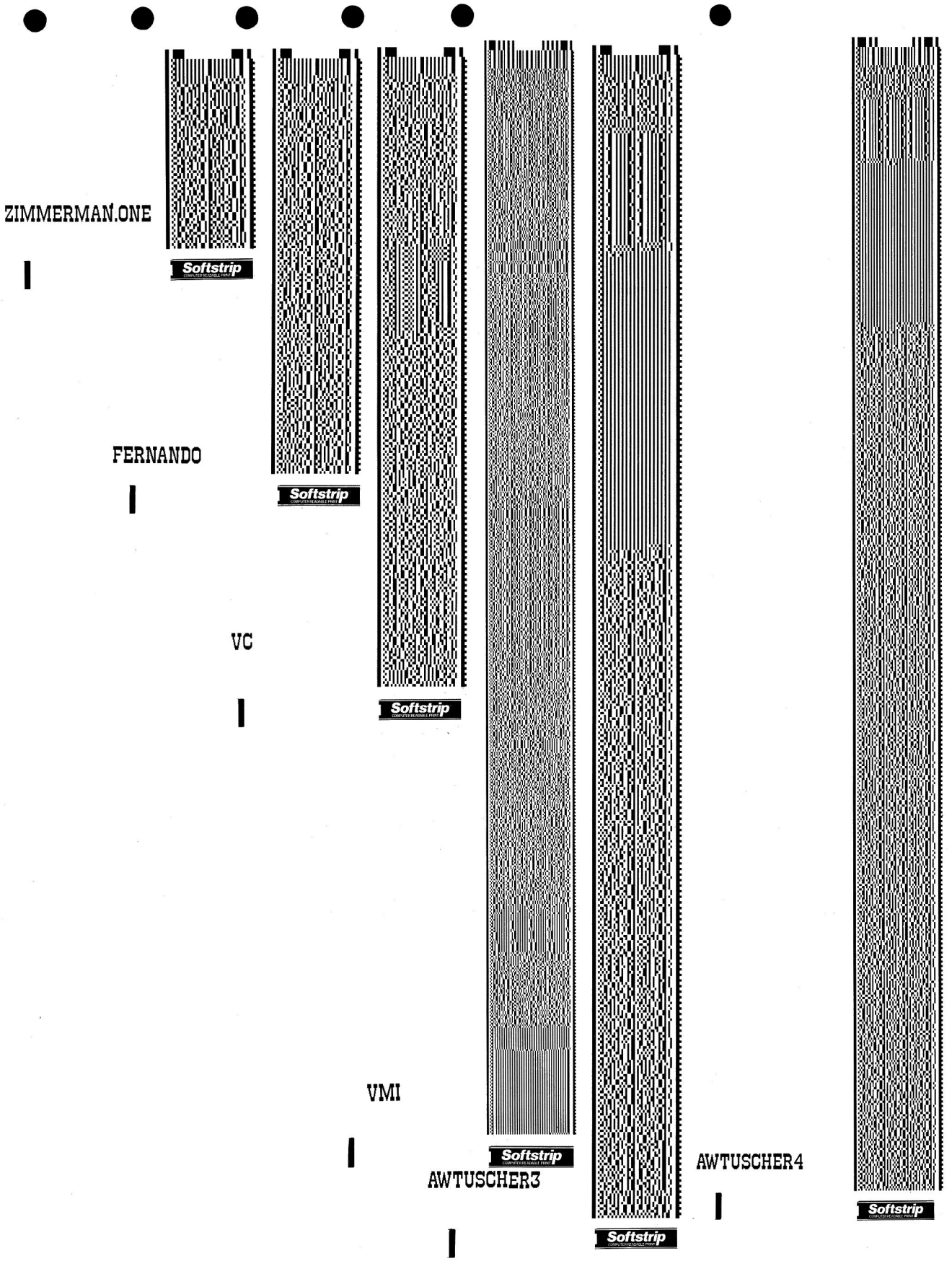
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People who have the best often are, but in the case of Apple there's more. Apple owners think back to how Apple got started in 1977, just two people working out of a garage and what happened is the talk of Wall Street and the computer industry as well. Many like the fact that Apple only makes computers. Unlike their competition they don't make typewriters, copiers or telephones. They do just one thing and that's one reason they do it so well.

At Applied Engineering we think the same way. You see, Applied Engineering is the only major hardware manufacturer totally dedicated to the Apple computer. Whereas most of our competitors must divide their customer support and engineering time between IBM, Atari, Radio Shack or other computers, our engineers only design products for the Apple. This dedication allows us to be much more familiar with the Apple and the people who use them.

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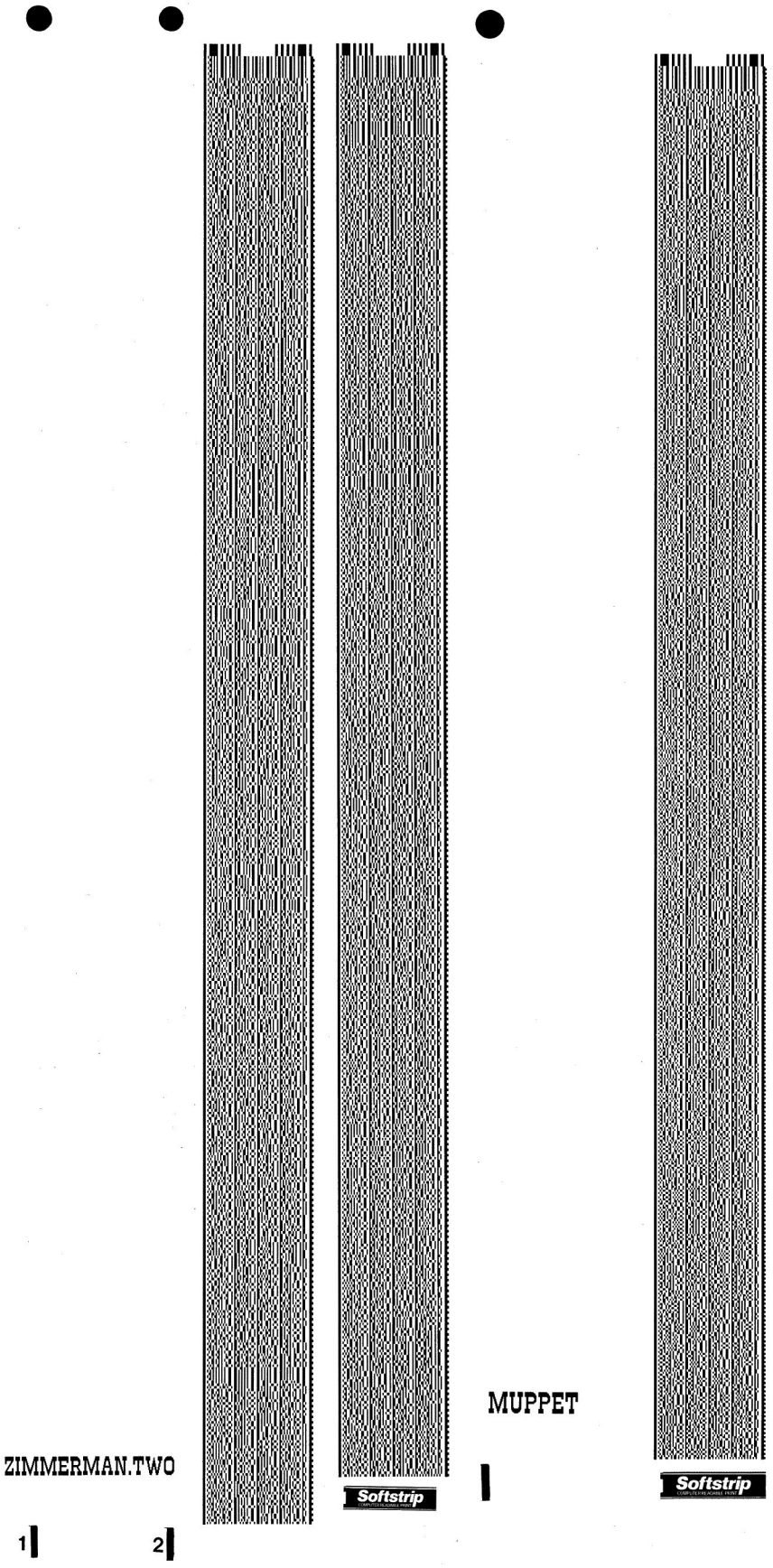

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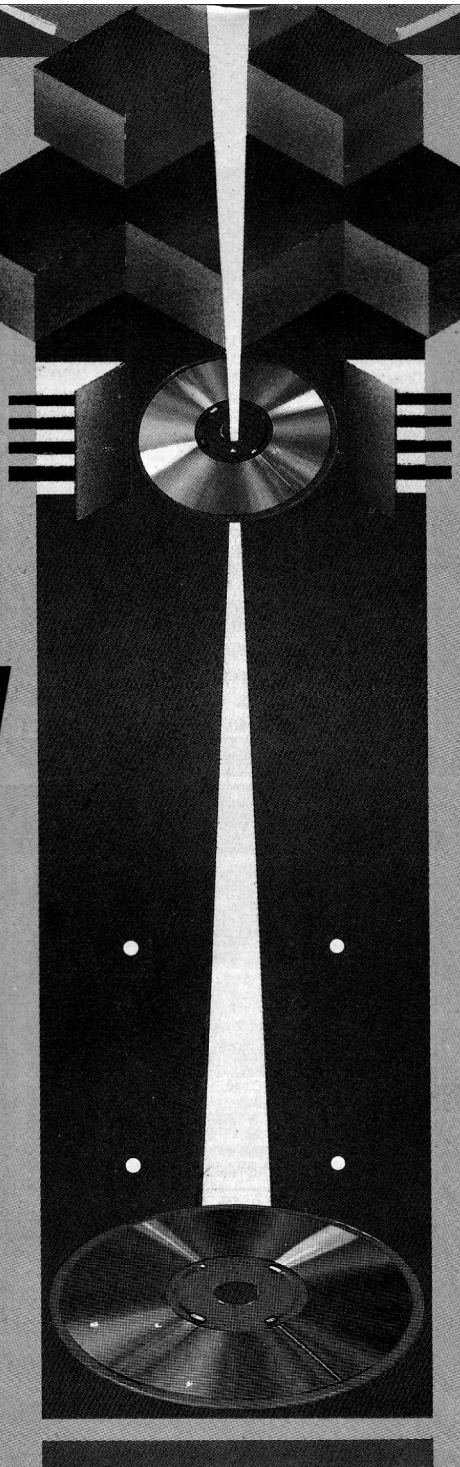

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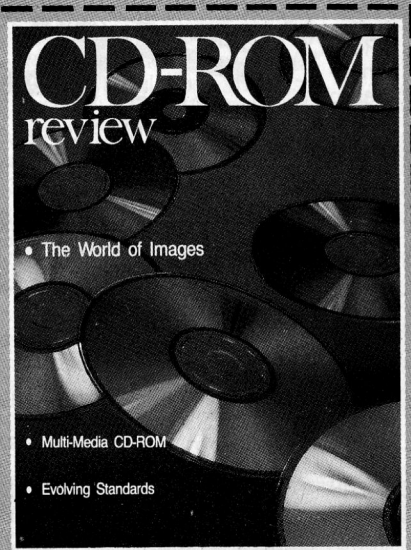

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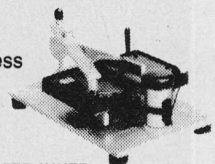

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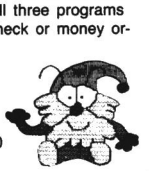

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Bear of the Year

You can tell a magazine's heroes by the pictures on its office walls. Editor in Chief Debbie de Peyster displays snapshots of herself with Steve Wozniak and Billie Jean King, while Assistant Editor Lafe Low admires a Cybill Shepherd poster and Review Editor Eric Grevstad has a crush on Carmen Sandiego. But one computer-industry figure, sharing the spotlight with his elegant wife Sara and their bouncing boy Bumper, commands two posters, plus decals on several phones. If *inCider* had a mascot, it would be Bedford Stickybear.

Even The Learning Company's R.W.M. (Reader/Writer/Math) Rabbit can't compete with Stickybear, the star of a series of educational packages developed by Optimum Resource Inc., and the hardest-working bear in show business. Critics say the bow-tied bruin has spread himself too thin, cranking out more titles than Stephen King; we recently saw a school-library guide that praised Stickybear ABC, but panned Stickybear Bop. Certainly he's been lending his name to programs with which he has less personal involvement than past entries. Nonetheless, the big guy still has the moves.

Doubtless prompted by Bumper's growing up, Stickybear's recent work seems aimed at somewhat older children; elementary ABCs have yielded to subtitles such "Ages 9 and Up" and "Ages 8 to 11." We missed his cheerful graphic presence in **Stickybear Reading Comprehension**, a text quiz for second- through fourth-graders in which they answer questions about stories. The review editor grumped, "What is this? Stickybear SAT?", but teachers should favor the program's ability to track student progress and let you enter your own stories and questions.

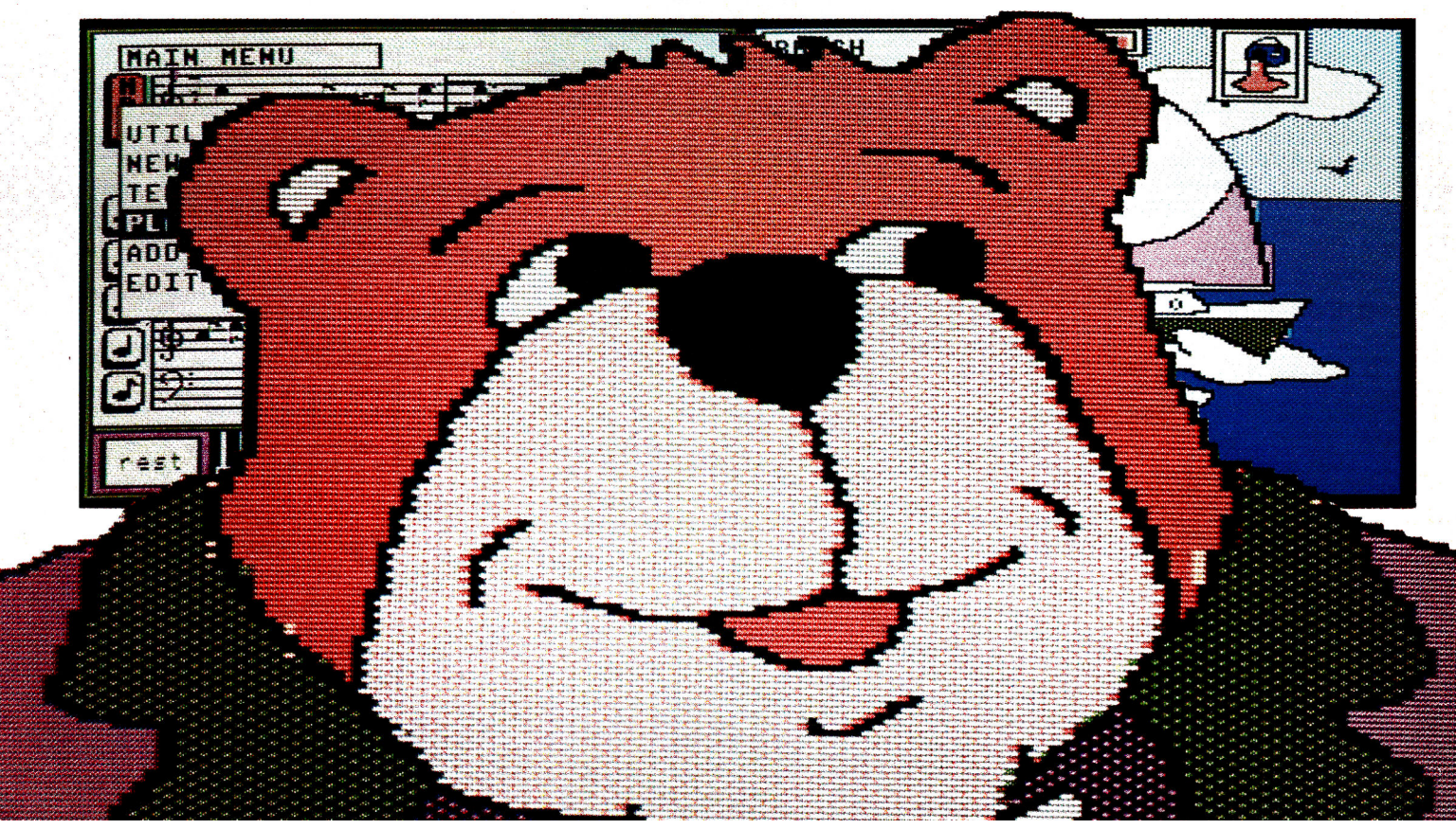
Stickybear BASIC is a disappointment, with Bedford utterly absent, while a few dozen text screens introduce kids to programming commands; the early lessons are nicely interactive, but the later ones get pretty dry. But perhaps the emphasis on programming indicates Stickybear's new career path—while no longer doing high dives or juggling letters as in his younger days, he's supplying complete application programs.

Stickybear Music is a simple music processor that lets kids compose, edit, and store songs, as they choose each note's duration from a vertical column of icons and its pitch from a nearly three-octave on-screen keyboard.

Our favorite, **Stickybear Drawing**, is a kid's answer to the current swarm of IIGS MacPaint imitations—the color palette's nothing to shout about and the fill option tends to smudge at borders, but the program's freehand, line-, and shape-oriented drawing abilities are surprisingly good. So are the zoom-mode (like MacPaint's Fat Bits), block-copy, undo, and disk slide-show functions. Moving among functions and menus slows you down, but at least Stickybear Drawing supports joystick, mouse, and tablet control. (Stickybear Music is strictly keyboard-driven.)

We don't know whether buyers will embrace Stickybear in his new role, retiring from active teaching to become a brand label like Betty Crocker. (Next thing you know, there'll be business programs called StickyCalc and StickyWorks.) We kind of miss the rough-and-tumble days of Stickybear Spellgrabber, but we've been through a lot with Bedford—no other magazine used him to test the IIGS or described that machine's fast speed with "Go, Stickybear, go!"—and we wish him well. For the most part, he's still a symbol of above-average educational programming.

The Stickybear series is sold by Weekly Reader Family Software, Middletown, CT 06457. The above programs are $39.95 each, which most customers should find bearable. ■



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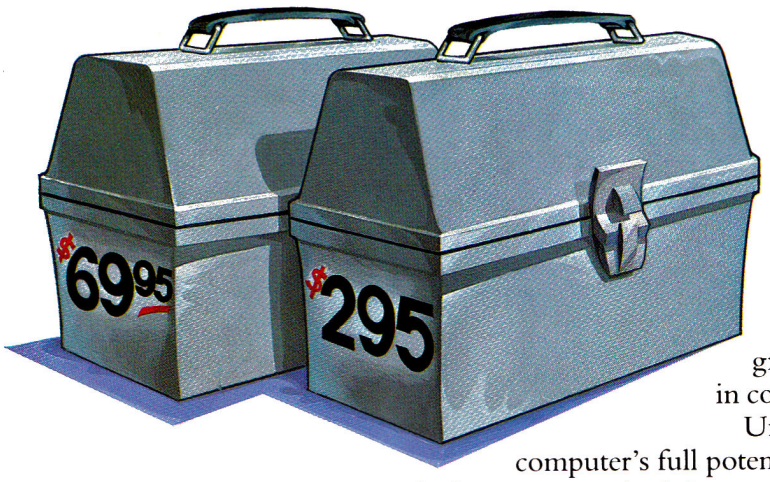

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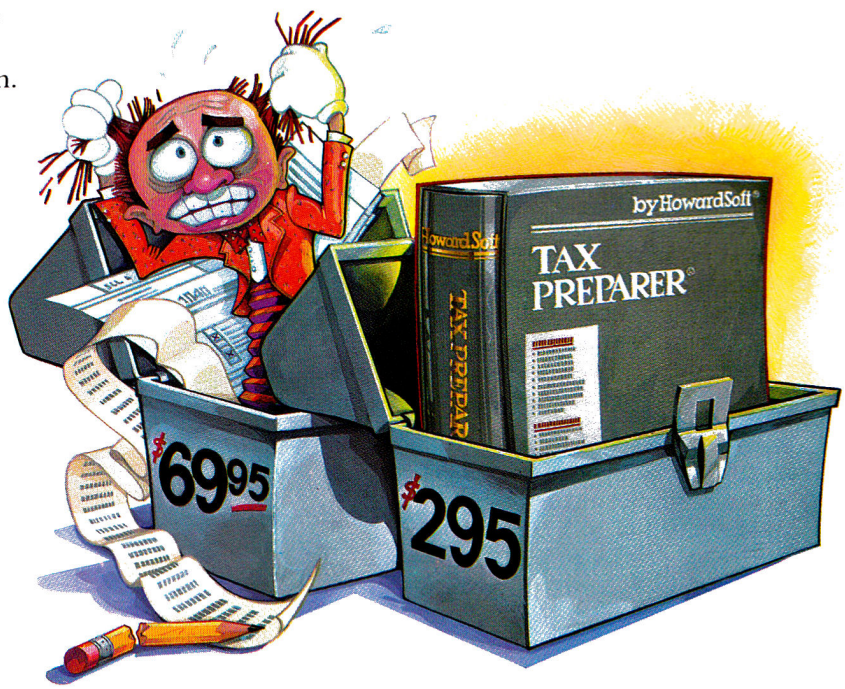

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