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p. 80

THE APPLE II MAGAZINE



inCider

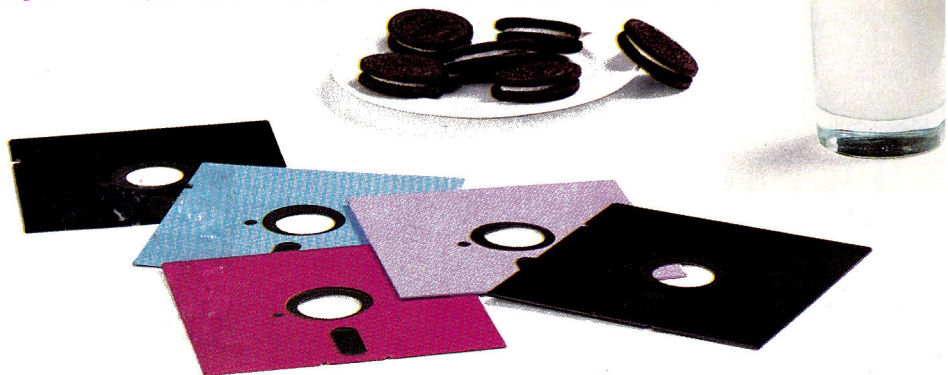
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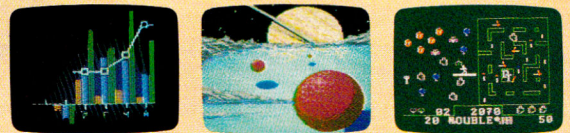
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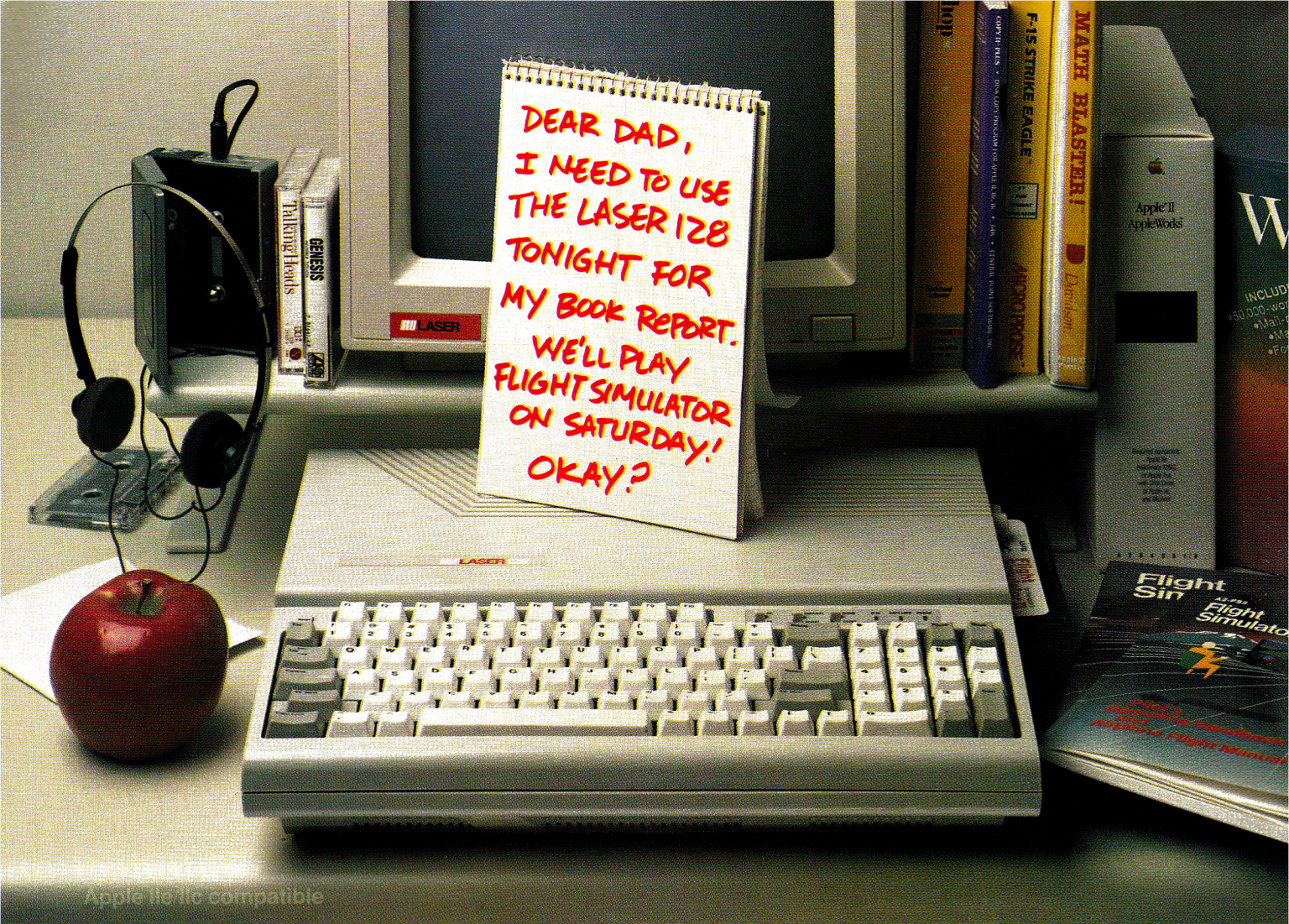
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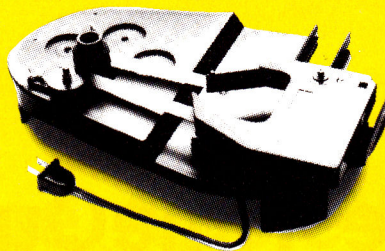
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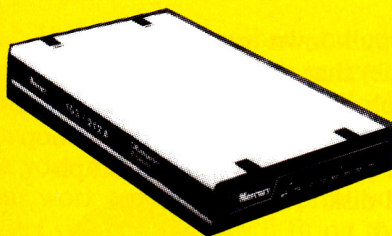
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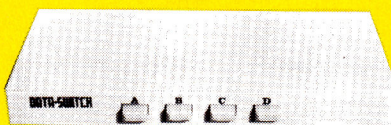


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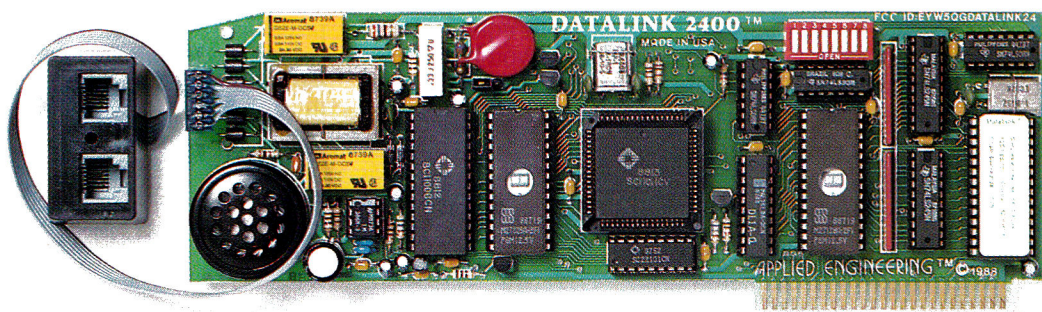
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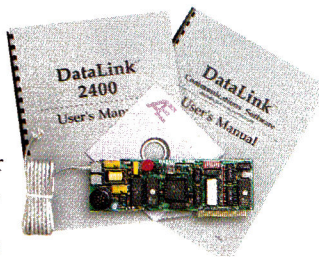


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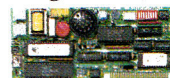
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ON THE COVER

47 Top 40 Software Hits for Home Education

Apple II software makes learning fun for kids, whether they're studying art, science, thinking skills, or the three Rs. Here's *inCider's* list of all-time favorite programs for work and play.

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Field Trip will return in October with a look at astronomy and rocketry programs for kids and hobbyists.

The Age of Enlightenment

by Dan Muse, Editor in Chief

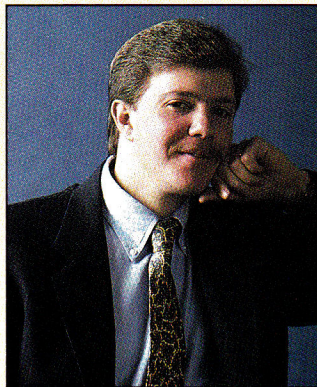
A couple of days after returning from NECC (the National Education Computer Conference) in Dallas, I was browsing through an antiques store in a small New Hampshire town. I picked up an old leather-bound book called *Little Journeys*, written by Elbert Hubbard, a rather obscure author whose work appeared in the late 1800s and early 1900s.

I confess that on that warm New England Sunday in June, the education conference wasn't on the top of my mind. But my thoughts turned back to education as I read the opening words of the book's first chapter:

It is a great thing to teach. I am never more complimented than when someone addresses me as "teacher." To give yourself in a way that will inspire others to think, to do, to become—what nobler ambition!

It is a great thing to teach, and the teachers I met at NECC showed me that. They didn't ask for more recognition or more money; they just wanted more resources—more computers and software—to do the best job they could. They were busy attending seminars to learn how to push AppleWorks even further, walking the exhibit floor to discover new software that would help give a sense of accomplishment to a child with a learning disability, and talking to colleagues to find out what was working in their classrooms. They were looking for a lot of things—but they weren't looking for a pat on the back.

I continued to skim Hubbard's book. The leather covers and yellowing pages reminded me of the age of these essays, which were written in 1902. It's alarming to see that when it comes to the role of



*"Technology doesn't
teach our children;
teachers do."*

teachers in society, things haven't changed much:

I will never be quite willing to admit that this country is enlightened until we cease the inane and parsimonious policy of trying to drive all the really strong men and women out of the teaching profession by putting them on the payroll at one-half the rate, or less, than what the same brains and energy can command elsewhere.

It's not surprising that this was written 86 years ago; however, it is surprising and disappointing that the statement is still applicable today. When you look at the technological advances we've enjoyed since 1902, it's sad to see that our thinking hasn't advanced. I'm impressed by local-area networks, CD-ROM (compact-disc read-only memory), expert systems, and so on. I'm excited about the potential these technologies bring to the classroom, but technology doesn't teach our children; teachers do.

Of course I'm an advocate of computers in education. But computers, or any type of technology, alone won't improve the quality of education. A good teacher without a computer is still a good teacher. A bad teacher with a computer . . .

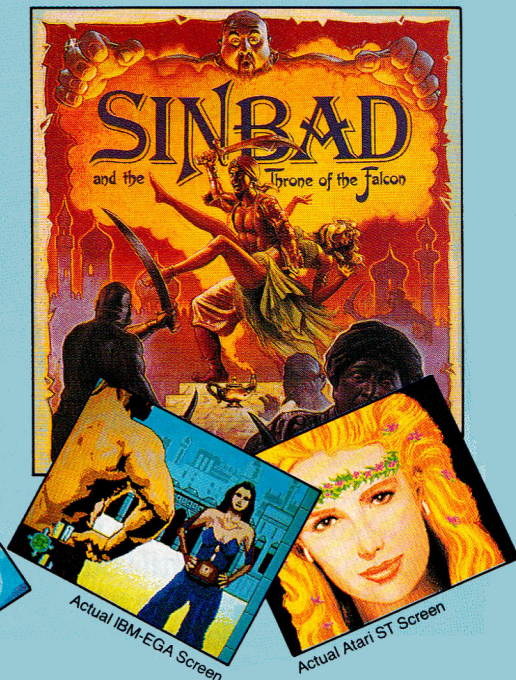
Governments—city, state, federal—will probably accept the logic of installing computers in the classroom before they realize we need to attract the best people to teach. As Hubbard wrote profoundly more than 80 years ago, "It is not the necessity of economy that dictates our actions in this matter of education—we simply are not enlightened."

Tom Snyder, a widely known software developer and a former teacher himself, has been trying to enlighten the public and the educational community for years. Tom's basic philosophy is that a classroom needs only one computer and that it should be on the teacher's desk to use as he or she chooses. I don't know whether I agree that classrooms should have only one computer, but his philosophy is sound: Teaching's the thing.

Tom certainly isn't alone. No hardware or software company is trying to replace teachers with technology. They're the first to tell you that their products—no matter how sophisticated—are only tools that are useless if not in the right hands. This is one case where we can't put the pressure on Apple or educational-software publishers. The products they create are better and better every year. It's our responsibility to make sure we don't forget that those products only enhance a quality educational program.

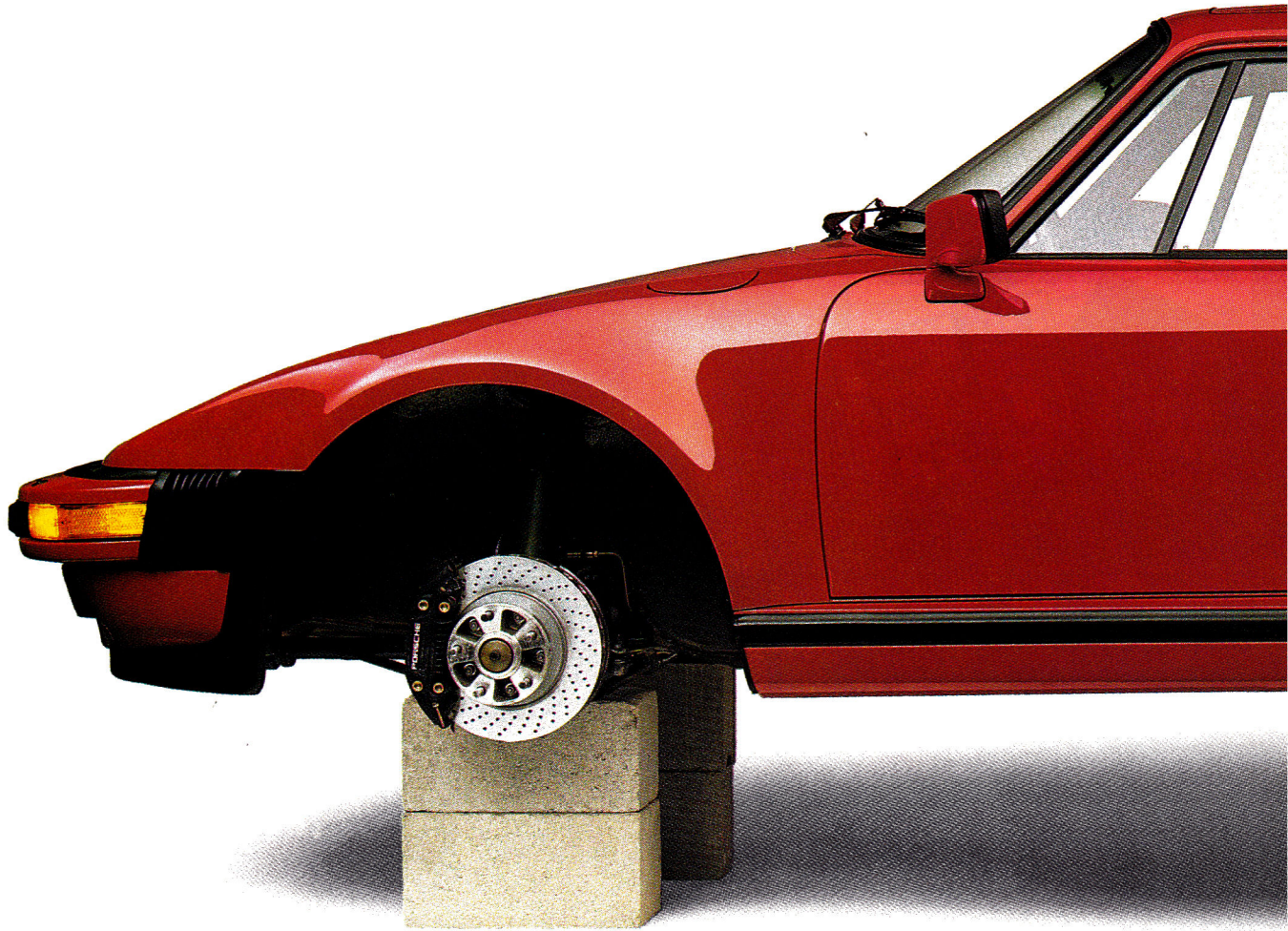
Technology's great. But let's give teachers respect, training, and fair compensation before we give them a local-area network. ■

P R E S E N T S



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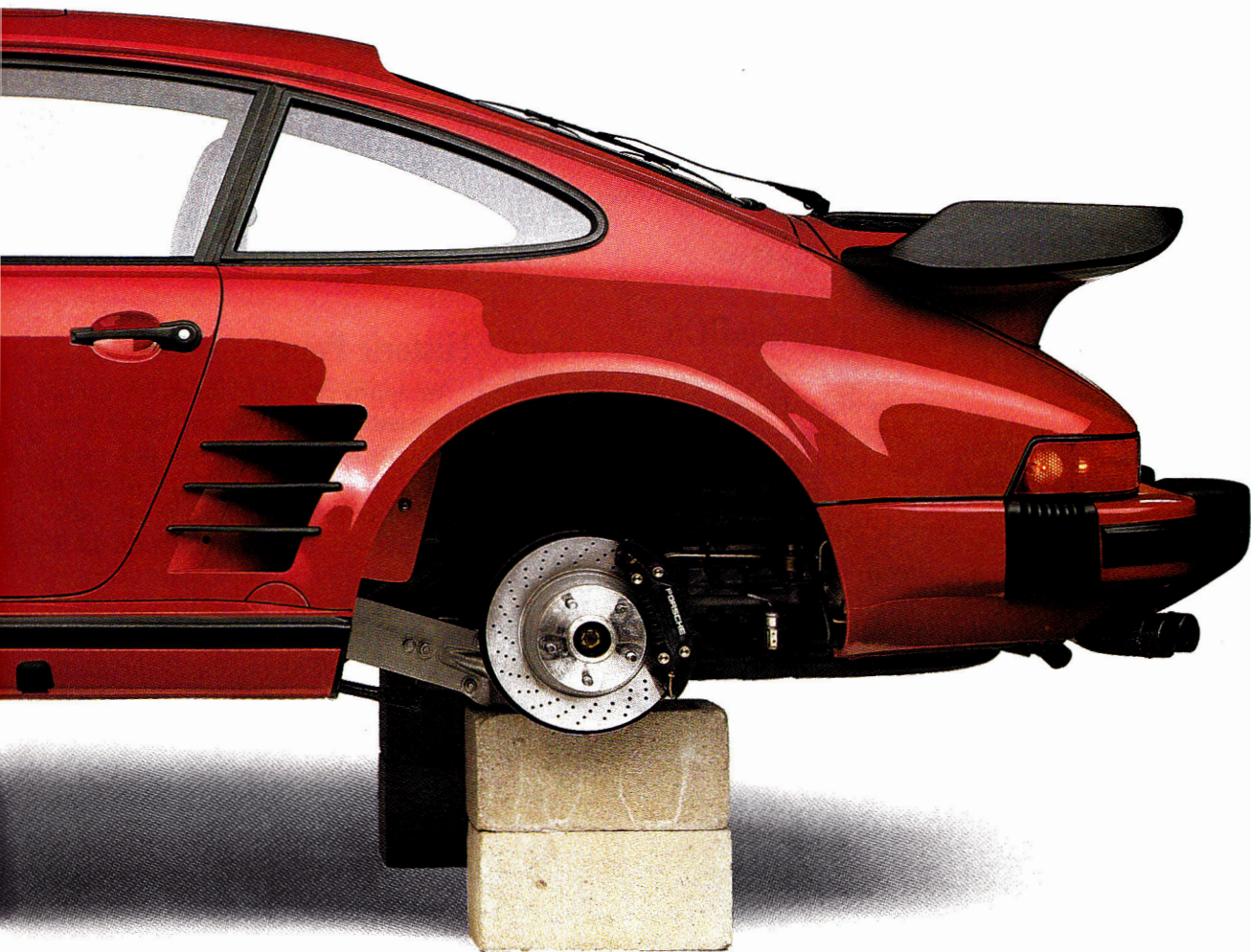
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For more information and the location of a nearby Claris dealer, call 800-334-3535, ext. 150.* If you've got an Apple II parked on your desk, we'll get it on the road to bigger and better things.

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Number, Please

In the sidebar "Basic Hardware Options" (May 1988, p. 72), Margaret Gorts Morabito and Cynthia Field recommend Realistic Minimus minispeakers with built-in amplifier. I rushed out and bought the speakers, but the Radio Shack salespeople were unfamiliar with the "external battery-operated amplifier" needed. Do you have a part number available? The speakers *are* great! Mean 18 takes on another dimension with amplified sound. Now I need some way to adjust the sound without going into the GS' Control Panel every time I change programs.

Steven M. Carlo
24 Clinton Street
Akron, NY 14001

Radio Shack sells a 200-megawatt audio amplifier for about \$12. It requires a 9-volt battery and has its own built-in speaker. The part number is 277-1008. —eds.

Keeping Up with Upgrades

I think manufacturers, program writers, and journalists are overlooking the type of Apple user I encounter at work, in our Apple user group, and in our AppleWorks Macro User Group. Most are still using AppleWorks versions 1.1, 1.2, and 1.3 and don't want to change.

Our suppliers don't have the products available when you review them. One potential member asked where to buy AutoWorks and my supplier said the TimeOut series replaced it. Can you imagine the frustration of an AppleWorks 1.3 owner when he or she opens the package and discovers that TimeOut works only with version 2.0?

Hundreds of Apple owners still use their IIC, IIE, Laser, and even II Plus computers (with third-party hardware and software to enable use of AppleWorks).

Most don't have the hours or dollars necessary to upgrade continually to the latest software and hardware. Additionally, many of these people use IBM and Hewlett-Packard computers at work, but their children use Apples at school. Fortunately, third-party hardware and software developers are bridging the gap between the II and other computers.

Marvin Yavitz
AppleWorks Macro User Group
P.O. Box 8375
St. Louis, MO 63132

Movin' to MS-DOS

I use a IIGS at home and work on an IBM in my office. I'm considering purchasing the PC Transporter ("PC Transporter: Best of Both Worlds?" June 1988, p. 77) and would like to know if I can use a hard drive while working in MS-DOS mode.

Max J. Levine
Suite 770N
4550 Montgomery Avenue
Bethesda, MD 20814

According to Applied Engineering, PC Transporter was made for the Apple II and is designed to work with Apple peripherals. —eds.

Dog-Gone Credits

When I received *inCider's* June issue, I thought *Softalk* was back. The cover photograph by Eric Fordham reminded me of Bert Kersey's much-talked-about dog, Sophie. For a nice photo of Bert and friends (including Sophie), see p. 66 in *Softalk's* October 1983 issue.

Jim Murphy
Route 1, Box 35
Cresco, IA 52136

You failed to give credit to the model photographed for the June 1988 cover.

This leaves me wondering who it is. At first I thought it was one of the Beagle Brothers, but closer examination revealed otherwise.

At least it's an improvement over a certain widely known swimsuit issue.

Rev. John M. Scott
Oakland United Methodist Church
R.D. 1, Box 313
Cooperstown, PA 16317

Posing on our June cover is Orvis, a four-year-old redbone hound who's now barking BASIC commands. —eds.

Historic Point

We appreciate your four-star review of Interviews with History in which your only criticism was too much disk swapping. This problem most likely occurred because the reviewer used only one drive and reviewed all 12 figures at once. Since students rarely interview more than one character at a sitting, they need to switch disks only once or twice with a single-drive system. With two drives, there's no disk swapping at all.

Jeanne Dietsch
Kinemation
43 Pine Street
Peterborough, NH 03458-3076

Whole Kit and Caboodle

I bought a used 10-megabyte Apple ProFile hard drive for my IIE, but I don't have the accessory kit. Do you know where I can purchase one?

Sun Remarketing, Inc., sells two ProFile accessory kits: catalogue #141 for \$99 and catalogue #142 for \$24. To be sure you order the proper kit, let the company know which Apple II model you use. The customer-service and order number is (801) 821-3221. —eds.

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Data-Strips Update

inCider will no longer be printing data strips to accompany the program listings in each issue. Data strips will be offered, however, on a free-subscription basis—just mail us 12 self-addressed, stamped envelopes and we'll send you a year's worth of data-strip sets as they become available each month. If you've already responded to the \$9.95 subscription offer mentioned in July's Letters section (p. 12), *inCider* will refund your check and sign you up for the free subscription service. All programs published in *inCider* are also offered on the *inCider* bulletin-board system (603-924-9801) and can be downloaded free of charge. *inCider's* editorial offices are located at 80 Elm Street, Peterborough, NH 03458.

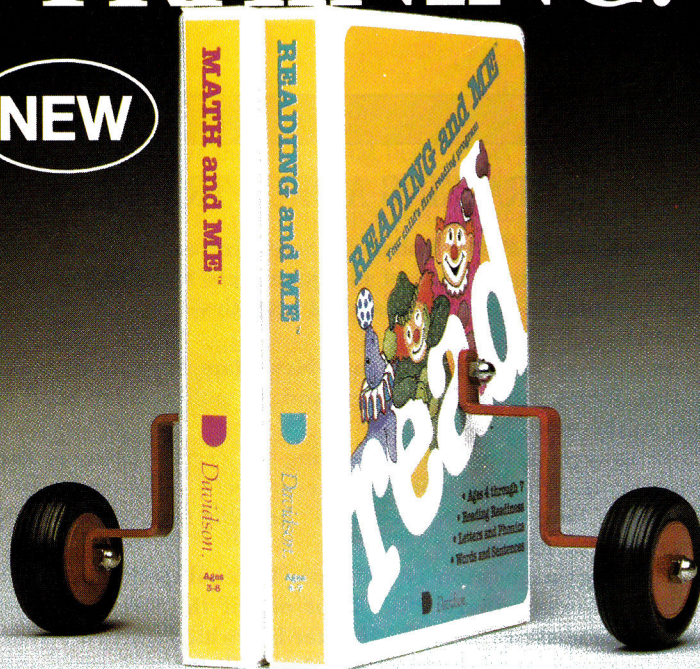
Correction

A representative from Steele Publishing has pointed out an error in our June 1988 Press Room Product Information (p. 91). FredWriter isn't a public-domain program. It's copyable, but it's a copyrighted program produced by Steele Publishing and marketed by CUE/SoftSwap, Box 271704, Concord, CA 94527. It's available only by mail order. For more information, contact CUE/SoftSwap at that address. To clarify another point of confusion, the clip-art program Christian Scenes and Symbols is produced by Teck/Parry Associates, as stated in Press Room (not by Steele Publishing). Teck/Parry's address is 220 First Street, Dravosburg, PA 15034, (412) 466-4065.

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.

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by *inCider* staff

SPOTLIGHT ON.....

TRACKING A DRUG TRAFFICKER

Thanks to Chief of Police Robert M. Snow, Jr., and his children's Apple II, a man accused of importing 12½ tons of marijuana into the United States is in jail. Snow used the computer to track the suspect's activities—his travel itinerary as well as his phone calls.

Snow is chief of police in the small New Hampshire town of Bartlett. Since the arrest, this White Mountains village and its police chief have found themselves suddenly in the news.

"In a drug investigation you're looking for certain patterns and types of calls," Snow comments. When he looked at the suspect's subpoenaed list of phone calls, it was 3000 items long—what Snow calls a "horrible task." Fortunately, it was a job his Apple was well suited for.

The computer in question is an Apple IIe equipped with RamWorks. Snow has added little other hardware: "It's right out of the box," he says. Snow used the AppleWorks database to create his master list, which tracked when, from where, and to whom the suspect made his calls. He also made use of AppleWorks' word processor to create "a general report of what I did." When it came to finding patterns, or what Snow calls "correlative ability," the Apple was a champ.

Better yet, the courts recognize the value of the computer, as well. "Everything I've done [with the computer] is admissible in court," Snow says. "We're exploring the possibility of bringing it into the courtroom," he adds.

But the computer can't stay at the Bartlett Police Department much longer. "I say it's my Apple IIe. It's not—it's my kids'. I bought it for them as a Christmas present," Snow says. "I just took it out of the house one day and took it down to the office. It's got to go home soon. My kids aren't happy with me." —P.P.

CLARIS ACQUIRES STYLEWARE

The adage goes, "If you can't beat 'em, join 'em." Claris Corporation (Mountain View, CA), publisher of AppleWorks, is changing that expression to read, "If you can't beat 'em, buy 'em." Claris recently announced the purchase of StyleWare (Houston, TX), publisher of Apple IIe/IIc and IIGS productivity software.

GSWorks, StyleWare's ambitious integrated program combining page-layout, word-processing, painting/drawing,

spreadsheet, database-management, and telecommunications modules (see "The Six-in-One Solution," July 1988, p. 42), was the probable reason for the acquisition. Claris' corporate goal is to be the leading Apple software company, and GSWorks promises to be the leading integrated software package for the Apple IIGs.

"It's always great to be part of a deal where everybody wins," said Kevin Harvey, former president and chief executive officer of StyleWare, now in charge of integrated software at Claris. "StyleWare gets the marketing strength of Claris; Claris gets a great product; and, most impor-

tant, the customer wins."

Claris and StyleWare didn't disclose the terms of the agreement, but *inCider* learned it involved several million dollars. Claris offered jobs to all StyleWare employees, who gave up their royalty rights to StyleWare products.

Claris hopes to begin shipping AppleWorks GS, as it will call GSWorks, on October 1, 1988. The price will be \$249, the same price as AppleWorks, and Claris promises an "aggressive" upgrade program for current AppleWorks owners who have a IIGs.

Claris will sell MultiScribe GS under the Claris label; at

press time it hadn't decided whether it would continue to market MultiScribe for the Apple IIe and IIc, although it will support current users. Harvey also promised that MultiScribe GS owners will be able to upgrade to AppleWorks GS.

John Zeisler, Claris' vice president of marketing, said explicitly that "home businesses will be a major market for AppleWorks GS," as well as education. He also stressed that Claris had acquired a "talented development organization" in StyleWare. Some observers speculated that the StyleWare team will begin work next on "AppleWorks Macintosh," a product that would complete Claris' line of "Classic" AppleWorks, AppleWorks/Network, and AppleWorks GS, for all Apple computers. —P.S.

UPDATE: COMPUTER LEARNING MONTH

If the month of October conjures up images of Halloween, Columbus Day, and autumn leaves, but not computers, you weren't paying attention last year. Last October was the first celebration of Computing Learning Month. In 1988, Computer Learning Month is back—and it's bigger and better.

The goal of Computer Learning Month, Director Sally Bowman says, is to increase the effective use of technology by motivating the presentation of



local events and recognizing innovative uses of computers.

According to Bowman, the scope of last year's project was narrow, "but we hit it hard. This year the scope is broader and we're hitting new markets, such as early learning, special needs, higher education, and adult learning. People are very excited. [Computer Learning Month] is showing signs of making a greater impact."

To help broaden the appeal and go beyond K-12 education, Computer Learning Month is sponsoring 11 contests, compared to five in 1987. The '88 contests include Newsletter/Storybook: Using the Computer as a Theme, Art & Computers, Telecommunica-

tions Dream Project, Best Special-Student Success Story, Lesson Plan—Learning Together, Lesson Plan—Early Childhood Education, Lesson Plan—Telecommunications, Lesson Plan—Special Education, Higher-Education Faculty Papers, Group to Group: Share Your Computing Knowledge, and Computer Learning Month Event. Last year, 45,000 contest entries were submitted, but Bowman says she expects that number

to triple in 1988.

According to Bowman, support for the project has been outstanding. Thirty-one states and 17 national organizations, such as the Council for Exceptional Children and the Association for Children and Adults with Learning Disabilities, have officially endorsed Computer Learning Month. Principal sponsors include IBM, Tandy/Radio Shack, Apple Computer, Commodore Business Machines, dozens of software companies, as well as publications such as *inCider*.

While support from corporations and organizations is important, the real key to the success of Computer Learning Month, according to Bowman,

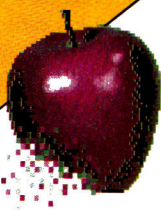
is its effect locally as "a grass-roots movement—libraries, user groups, PTAs—that will help provide equal access to computers."

While Computer Learning Month is a project of the Software Publishers Association, it's a separately funded non-profit education foundation. For more information, write to Computer Learning Month, P.O. Box 60967, Palo Alto, CA 94306-0967.

—D.M.

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.

APPLE BITS



■ Where in North Dakota is **Carmen Sandiego**? And why? Carmen is now appearing in a special edition for schools in the Peace Garden State. Developers were heard to mutter, "There aren't enough landmarks in North Dakota to fill a 5¼-inch disk."

■ Best games at Summer CES? **Battle Chess** and **Pete Rose Baseball** (Activision), **Downhill Challenge** and **ShufflePuck** (Broderbund), **Neverness** and **Final Assault** (Epyx). **Gone Fishin'** (Interstell) was a big favorite among *inCider* editors.

■ The FBI knows that **Bubble Ghost**, **Fourth and Inches** (Accolade), and **Tetris** (Spectrum Holobyte) appeared on Apple BBSs near Boston shortly after AppleFest in May.

■ **TimeOut** AppleWorks additions sell so well for **Beagle Bros** (San Diego, CA) that the company sold off its inventory of Apple utilities. Look for **telecommunications** and **painting** in TimeOut soon.

■ And who sells more **TimeOut** software than anybody? The **National AppleWorks User Group** (Canton, OH). It also publishes a better newsletter than other clubs' every month and a list of local phone numbers for AppleWorks support.

■ *Pommes de terre* department: **The Road Apple** is an underground newsletter for **fanatical Apple II users** (1121 N.E. 177th Street, Portland, OR 97230). "**Sack the Mac**" is its cheery motto.

■ And what do fanatical Apple II users call someone whose computer uses **windows**, **icons**, **mouse**, and **pull-down menus**? A **WIMP**.

■ Video Technology should have the latest **Laser** computer in the stores by the time you read this.

■ **Roger Wagner** says he's just about finished a "**hyper-like**" program for the Apple IIGS: Look for it at September AppleFest.

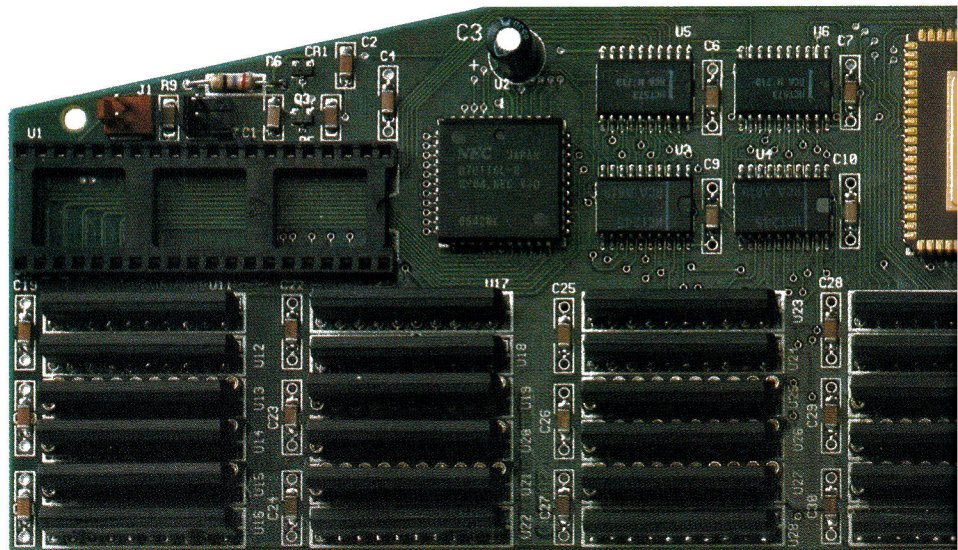
■ **AppleWorks 2.1**, which should be available from Claris this month, fixes the "Control-@" bug as well as another nagging bug that trashes files you try to save, among others.

■ **Mediagenic** is **Activision's** new name: Vice President Stan Roach takes credit for stealing the name from *Time* magazine's description of a talented, attractive, young violinist.

■ If you're looking for **GS games**, keep an eye on **Cinemaware** and stay away from **Electronic Arts**.

■ Meanwhile, **Luc Barthelet**, developer of GS software for **Activision**, has moved up the road to **Electronic Arts**. Curiouser and curiouser.

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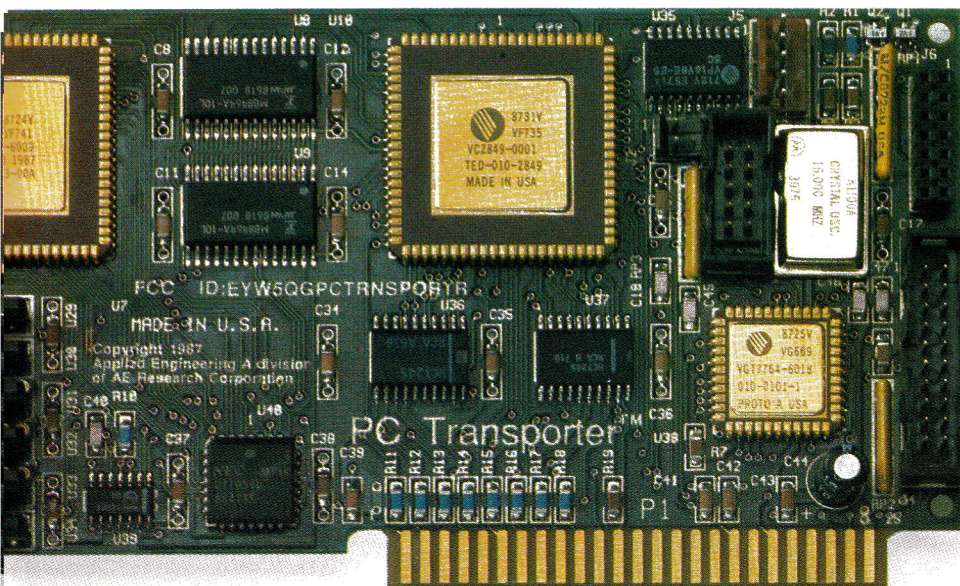
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Say It Ain't So, Joe

by William P. Kennedy, Ph.D., Technical Editor

Introducing Not for Programmers Only, a bi-monthly column of essays and sketches by inCider's technical editor, Bill Kennedy, which will alternate in this space with Status Report.

My cousin Jack was insisting I meet a friend of his. "You know about computers," Jack explained. "So does Joe. You have a lot in common." To me, such insights are similar to "You have a lot in common. He likes to eat, too." But Jack's prodding was enough to overcome my skepticism on a recent dreary Saturday afternoon.

Jack's four-wheel-drive Jeep was barely able to navigate the long, muddy, rutted drive up to Joe's cabin deep in the backwoods of New Hampshire. Joe's wife met us at the door and invited us in. "Joe's in his usual place," she said. "Just see yourself down." She nodded toward a doorway just off the kitchen and disappeared quickly.

It's not uncommon for homeowners to finish off the cellar with a family room or office—but Joe's basement reminded me more of Dante's Inferno than a yuppie wet bar. Behind a rough-hewn wall the wan, green glow of a computer monitor illuminated a pale and disheveled figure. Joe's boyish looks combined with long salt-and-pepper locks and beard startled me.

"What's?"

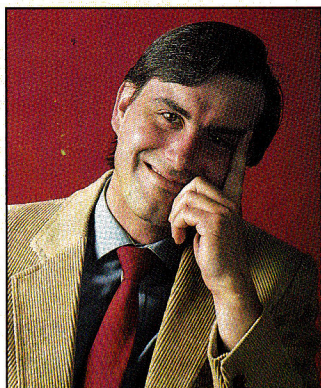
"What's what?" I countered.

"No, not what's, watts!"

"Which watts?"

"Byte that bit, man. I've got bugs."

My instinctive stamping about with my foot only brought disdain from our host. "Not there! Here!" he demanded, point-



"Joe's basement reminded me of Dante's Inferno."

ing to a grey steel box high on a rickety two-by-four shelf.

His cold eyes fixed on my own. "Need to boost the input and improve the N to S. Damn cheap giga down's not sensitive enough."

Two cable trusses emerged from the back of the steel box. One extended through the cellar wall; the other, into another steel box labeled with three familiar letters. A steady stream of hexadecimal numbers percolated up the screen; the microcomputer appeared to labor under indecision.

"Joe here's trying to make a software trap," Jack explained. "Hopes to listen in to software companies all around the country and pick programs right out of their development machines."

"Ah! So that explains the microwave dish antenna out back," I reasoned, al-

though its wild arcing through every conceivable azimuth remained a mystery.

I drew a short breath as I realized suddenly what was really going on. "Rather elaborate setup just to pirate software, don't you think?"

"Gotta get it hot, dude. First with the algo-rhythms. Gonna synthesize the next gen' of spreadsheets, word pros, dbs!"

I diverted my attention from Joe's intensity to his floor-to-ceiling bookcases stuffed with boxes of 5¼-inch disks. Familiar titles were handwritten on the labels. "Aren't these enough?"

Jack intervened. "Old stuff. Anyway, he just likes to make copies. Never uses the stuff himself. Gives a lot away to friends. Like Robin Hood, you know?"

"Any of these programs Joe's work?"

"Here's one." Jack dusted off a short printout on yellowing paper. It was a BASIC program titled "Mandelbrot Plots."

"Doesn't have much time for this kind of thing now. Spends all his time 'archiving' software."

"Gotcha!" Hands gliding across the keyboard, Joe leaned intently toward the green screen. The hex codes appeared to settle into a pattern. End of visit.

"Shame he neglects his family, though," Jack observed as we drove home.

"He's really quite talented," I offered. "But he seems obsessed with pirating software. Rather like assembling a library without reading a single book."

"The challenge, don't you get it? It's the challenge he's risen to. Takes a lot of know-how to pirate with the best of 'em."

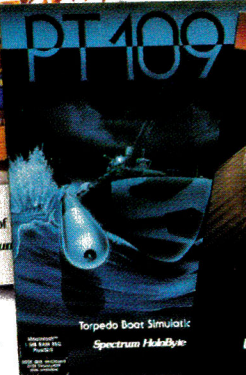
"Easier than reaching for the greater challenge of creativity." We sat silently, caught up in our own thoughts for the remainder of the trip. I felt lonely. ■

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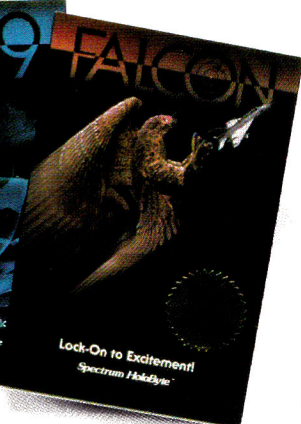
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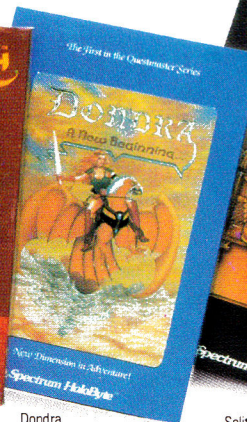
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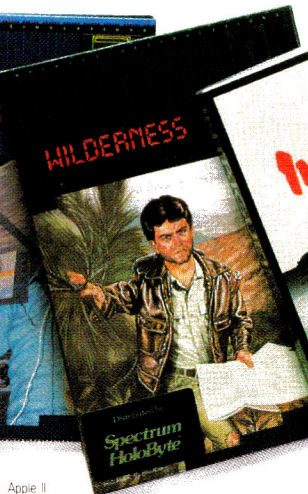
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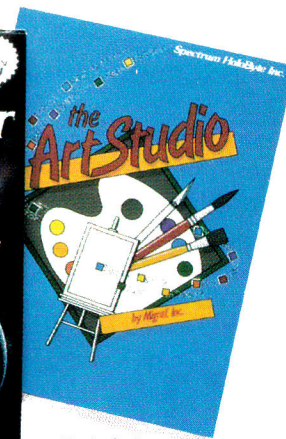
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Disk-Drive Update

by William P. Kennedy, Ph.D., Technical Editor

To Plug or Not to Plug

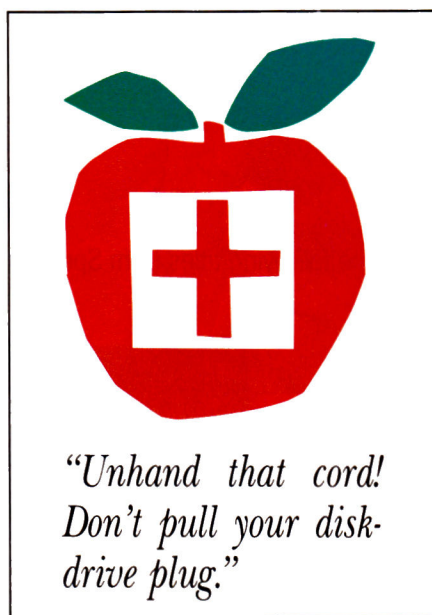
I have an Apple IIc with an external disk drive I purchased from JDR Microdevices. Everything worked fine until I had to replace the IIc motherboard. Now the computer won't boot when the "plain Jane" external drive is connected. Rather, I now boot the system and plug in the JDR drive carefully after things settle down; everything works fine after that. Why does that external drive mess things up when I boot the system but not later? Is it okay to plug in the external drive with the IIc's power on? I'd hate to have to dump that extra drive and buy a new one.

Henry Amelung
Alamogordo, NM

Unhand that cord, Henry. Don't do it! As Nancy Borden, a computer-sales consultant for Macy's of New Jersey, cautions, "Never unplug or plug in an external drive from a IIc with the power on, whether the drive is running or not. We've lost three of our IIcs that way." Apparently, the current program will run fine. But, according to Nancy, the next time you try to boot another disk "you'll only get the dreaded 'check disk drive.'"

Why doesn't your system boot the way it used to in the old days? Apple upgraded the IIc motherboard and ROMs (read-only memory chips) to accommodate memory expansion and the UniDisk 3.5. On bootup, ProDOS now polls all the various device ports for connected peripherals and, in some cases, attempts to initialize them. I suspect your IIc thinks your JDR drive is an intelligent device like the UniDisk and attempts erroneously to initialize it. That's probably why things lock up for you on bootup.

On the other hand, when nothing's plugged in, the IIc configures the port as it does when



Jan Muller

a "dumb" external 5¼-inch Apple drive is connected. That's why you can plug your JDR drive into the external port after bootup and have it work properly.

What to do? You can't change the IIc ROMs, or the JDR ones, either, for that matter. Contact JDR Microdevices and ask whether the company has produced a ROM upgrade for its drive interface that'll work with the SmartPort.

One other thing (a shot in the dark): Make sure pin 4 on the DB-19 connector from the JDR drive is grounded and pin 9 has no connection. Pin 4 on the GS and maybe on recent versions of the IIc motherboard's disk connector differentiates between 5¼- and 3½-inch disk drives. Pin 9 is the external interrupt line and should be unused for 5¼-inch drives.

IIc Hard Drive

We own an Apple IIc and use it primarily for home productivity. We've expanded the IIc "every which way" but one—a hard-

disk drive. Is there one available for our computer? We haven't seen any advertised.

Steven and Kelly Bergesch
Annandale, MN

Yes, there is one—the Quark QC20 from Sun Remarketing, Inc. (P.O. Box 4059, Logan, UT 84321, 800-821-3221). The company's summer catalogue lists this 20-megabyte hard-disk drive for \$895. It plugs into the external disk-drive port. For more information on the Quark line, see "Hard-Driving Disks," September 1985, p. 24.

Revitalizing the Disk II

I have a new Apple IIcs to which I've connected a 5¼-inch drive daisy-chained to a 3½-inch drive. I also own an old Disk II, but sold its controller card. Can I daisy-chain that Disk II to the other 5¼-inch drive by simply adapting a DB-19 connector to it?

Gil Chuck
Camarillo, CA

Yours, Gil, is just one of a flurry of letters I've received from loyal Apple Disk II owners hoping to recommission the drive for use with a IIc or GS. Julie Howard at Redmond Cable (17371-A1 Northeast 67th Court, Redmond, WA, 98052, 206-882-2009) assures me, "No problem!" Apparently all you need is an adapter cable to convert the Disk II's (and, presumably, other manufacturers' similar drives') 20-pin female plug to a DB-19 male plug, with the correct SmartPort connections, of course.

Redmond's special Y-adapter lets you connect one Disk II as drive 2 to a IIc's external-drive port. You can connect two Disk II drives to the GS, either directly to the disk port or daisy-chained from a 3½-inch drive. In all cases, the 5¼-inch drives will appear as slot 6, drives 1 and 2.



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Circle 137 on Reader Service Card.

Quickies

Operate an AppleCat II modem with CommWare II communications software on the Apple IIgs: Set the GS speed to normal (Control Panel), push down the "caps lock" key, and boot from slot 6.

—Robert Mengelkamp,
Carson City, NV

Ditto: Use the newest version of CommWare (5.1A). Boot into BASIC, LOAD HELLO from the Novation disk, DEL 30, then SAVE HELLO. The GS doesn't like the way line 30 in the program POKES at the "smart" slots. The program should now boot up into 80-column mode and operate fine.

—Ed Croft, Sterling, IL

Read the current time and day from Applesoft BASIC on the IIgs: According to Apple Technical Support, Charlotte, North Carolina, as shared with us by A. Ward Francis, Wayne, PA:

```
10 FOR I = 768 TO 915
20 READ N: POKE I,N
```

```
30 NEXT I
40 CALL 768: T$ = ""
50 FOR I = 896 TO 915
60 T$ = T$ + CHR$( PEEK (I))
70 NEXT I
80 DAY$ = LEFT$( T$, 8)
90 TIME$ = RIGHT$( T$, 11)
100 PRINT DAY$, TIME$: END
500 DATA 24,251,194,48,244,0,0
510 DATA 244,128,3,162,3,15,34
520 DATA 0,0,225,56,251,96
```

Enter an "escape" code sequence in an AppleWorks document: Create a custom printer and hit the escape key only for boldface begin and end. Then, in a document, press Control-B followed by the appropriate code. For example, Control-BK2Control-B&@Control-B\$Control-BKO will print a red apple on the ImageWriter II.

The adapter cable also should be of special interest to GS owners who have the newer 5¼ inch drive but want to add a Disk II to the system. You've probably already noticed that the Disk II controller card in slot 6 overrides the SmartPort drive. You can access both drives with the adapter.

Restoring AppleWorks' Spacebar

On several occasions in the past you've published POKE statements that skip the "press spacebar to continue" message and date entry when you start AppleWorks. That's great—but what if you need to retain the spacebar prompt so that you can use the special AppleWorks utilities provided by Applied Engineering's RamWorks III or RamFactor card? What values should I POKE back into my modified AppleWorks program?

James Smoot
Augsburg, Germany

As you suggest, not having to press the spacebar and enter a date when you press AppleWorks is a blessing for most. I'm surprised Claris hasn't yet incorporated that simple upgrade into the 3½ inch version. Oh, well. . . .

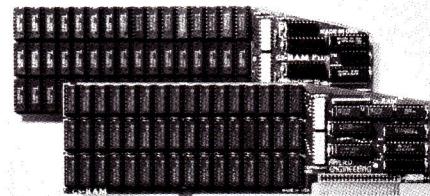
Below are the POKE addresses and values you need to use to modify APLWORKS.SYSTEM, which you should BLOAD as a ProDOS TSYS file under Applesoft at A\$2000 from the AppleWorks disk, version 2.0. If you need the fix for other versions or are unsure about how to accomplish the modification, drop me a note or consult "Just Go On," March 1988 issue, p. 96, for details:

```
POKE 14468,44 (original value = 32)
POKE 14148,208 (original value = 32)
POKE 14149,19 (original value = 56)
```

The first POKE skips the spacebar; the next two skip the date entry/verification step. Thus, James, POKE 14468,32 to restore your AppleWorks program to its original condition. ■

Apple Clinic is a forum for discussing and answering your questions and concerns about Apple II hardware and software. Address your correspondence to Apple Clinic, inCider, 80 Elm Street, Peterborough, NH 03458. Because of the volume of letters, most won't appear in print, but expect a response from Dr. Kennedy via postcard.

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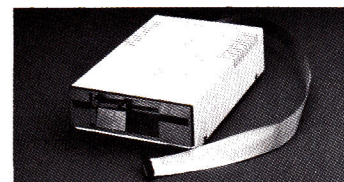
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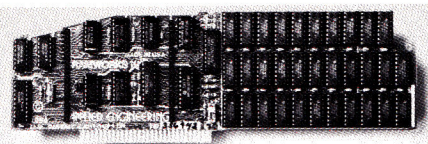
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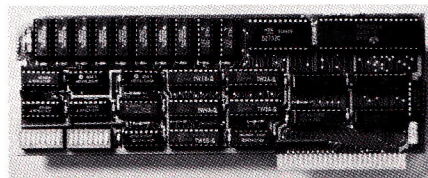


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Beagle G.P.L.E. or Super MacroWorks	31.	TML Systems TML Basic (IIgs)	84.
D-Code, Extra K, Power Print or Triple Dump	25.	TML Pascal (IIgs)	84.
Borland Turbo Pascal 3.0 (Req. CP/M)	48.	TML Source Code Library (IIgs)	35.
Funk Software Sideways Prodos & Dos 3.3	41.	TML Speech Toolkit (IIgs)	49.
Roger Wagner SoftSwitch (IIgs)	41.	TML Pascal APW (IIgs)	84.
Merlin 8/16 (IIe, IIc, IIgs)	79.	Zedcor ZBasic 4.0	39.

Accessories

Abaton Propoint ADB Turbo Mouse (IIgs)	119.	System Saver (Platinum or Beige)	69.
Apple Computer Apple Mouse IIc	125.	System Saver (IIgs)	79.
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Audio Animator (IIgs)	185.	Koala Pad Plus w/Graphics Exhibitor	84.
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Curtis Ruby	55.	Mouse Systems A+ Mouse (IIc)	52.
Curtis Ruby Plus	60.	A+ ADB Mouse (IIgs)	87.
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Teakwood Rolltop Disk Case (Holds 50)	18.	Street Electronics Cricket IIc	125.
Kensington Mouse Pocket (Reg. or ADB)	8.	Echo IIb Speech Synthesizer (II*, IIe, IIgs)	109.
Mouseway (Mousepad)	8.	Summagraphics Bit Pad Plus (IIgs)	335.
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Imagewriter I or II Cover	9.	Available colors: black, blue, brown, green,	
Mouse Cleaning Kit w/Pocket	17.	orange, purple, red, yellow, silver or gold	
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Apple Security System	34.	ImageWriter Ribbon-Black six pack	20.
Printer Muffler 80	43.	ImageWriter II - 4 Color Ribbon	9.
Printer Muffler 132	58.	ImageWriter Rainbow Pk. (6 Colors)	20.
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A/B Box (IIgs)	63.	ImageWriter LQ 4 Color Ribbon	22.

Phenomenal Prices...

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Broderbund Geometry (IIgs)	68.	Gertrude's Puzzles or Secrets	31.
Science Tool Kit Master Module	55.	Robot Odyssey I or Rocky's Boots	34.
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Mavis Beacon Typing (IIgs)	37.		
First Byte/Electronic Arts MathTalk, KidTalk, First Shapes, Speller			
Bee, or Smoothtalker (All IIgs, each)	37.		
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2400E	159.	Pro Modem 2400 (Non Expandable)	309.
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Datalink Modem 2400B (Int II*, Ile or IIgs)	185.	Pro Modem 1200A (Single Card)	169.
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Hayes Smartmodem 1200A (Internal)	265.	Supra Corporation Supra Modem 2400 (Hayes Compatible)	149.
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Hayes 2400 Baud Smartmodem	449.	U.S. Robotics Courier 2400E	379.
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Centech 3 1/2" DS/DD Color Disks (box of 10)	17.	3M 3.5" DS/DD (box of 10)	20.
Sony 3.5" DS/DD (box of 10)	18.	C. Itoh 3.5" DS/DD Color Disks (box of 10)	25.

Printers

Brother M-1109AP ImageWriter Comp.	249.	Panasonic KXP-10801/M2 (144 cps) NLQ Mode	209.
Epson Okidata	Call	KXP-10911/M2 (192 cps) NLQ Mode	229.
Microline 182P (120cps Dot Matrix 10")	275.	KXP-10921 (240 cps) NLQ Mode	349.
Microline 192Plus (200cps Dot Matrix 10")	349.	Seikosha Seikosha SP 1000	
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A.5 Half Height (II* & Ile)	139.	XL 45 Plus SCSI Hard Drive (Ile & IIgs)	829.
A.5C Half Height (Ilc)	139.	First Class Peripherals Blank Tape 5 Pack	65.
Micro Sci C2 Controller	52.	Sider 20MB or 40MB Hard Drive	Call
Applied Engineering Transdrive 360K	209.	B-Sider 60MB Tape Backup	Call
Transdrive Dual 360K	289.	Revision D (Chip/Software for CP/M)	52.
Transdrive Half Height 360K	119.	Hi-Tech Peripherals Full Height 5 1/4" Drive for Apple Ile or Ilc (Beige)	139.
Central Point Software Universal Disk Controller	79.	Half Height 5 1/4" Drive for Apple Ile or Ilc (Platinum)	149.
Central Point 800KB Drive	185.	Half Height 5 1/4" Drive Platinum for IIcs	169.
Universal Disk Controller 800KB	259.	Apple Ilc Drive Adaptor	15.
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60 MB w/ SCSI II card	955.		

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Paint/Write/Draw (Not Protected IIgs)	115.	Video Title Shop Companion Vol 1	30.
Clip Art Gallery or Postcards (IIgs)	21.	Video Title Shop Companion Vol 2	15.
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Print Shop Graphics Library Party Edition (IIgs)	24.	StyleWare, Inc. TopDraw (IIgs)	58.
Data Transforms Printrix I.I	46.	Thunderware Thundercan Apple (IIgs, Ile, and Ilc)	179.
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Communication Software

Activision Teleworks Plus (IIgs)	68.	Pinpoint Point-To-Point	74.
Checkmate Technology ProTERM (IIgs, Ile, Ilc)	95.	United Software Industries ASCII: Express Pro: Prodos or Dos 3.3	74.
Compuserve Compuserve Starter Kit	24.	ASCII: Express Moustalk 1.5	74.
Grolier On Line Encyclopedia	32.		

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REVIEWS

Zip Chip; GEOS; List Plus; Where in Europe Is Carmen Sandiego?; At a Glance; Games Editors Play: Alien Mind; Ticket to Washington, D.C.; Leisure Suit Larry in the Land of the Lounge Lizards; Short Takes

Fast Company

ZIP CHIP

Zip Technology, 11340 West Olympic Boulevard, Los Angeles, CA 90064, (213) 473-7662

Replacement 65C02 chip accelerator; Apple II Plus, IIe, IIc, Laser 128
Approximately \$179 (retail price undetermined at press time)

Rating: ■■■■

Would you wait a year to save an hour with AppleWorks every day? Waiting for the Zip Chip frustrated many Apple users, but my verdict is simple: The Zip Chip works.

The Zip Chip is a microprocessor chip that replaces the 6502 or 65C02 chip that's really the "heart" of your Apple II. The Zip Chip beats four times faster than the poky 6502, though—four million cycles per second, or four megahertz (four MHz), while the original Apple II runs at one MHz. The 65816 chip in the Apple IIGS trails the Zip Chip at 2.8 MHz.

HOW TO ACCELERATE A COMPUTER

Speeding up a computer, however, isn't as simple as accelerating the microprocessor. If an Apple II did nothing but add long columns of binary figures, an Apple II with a Zip Chip would add them four times as fast. But a computer also has to report results to the video display or printer, get information from the keyboard or mouse, and perform more complex calculations than simple addition. The Apple II was designed to do things at 1 MHz, and that's why any accelerator has to slow down frequently.

Older accelerator cards, such as Applied Engineering's Transwarp or the Titan Accelerator IIe (which is no longer available) combined a faster micropro-

cessor, like the one in the Zip Chip, with 128 kilobytes of random-access memory—as much RAM as a IIe with an 80-column card or a IIc. This little "computer on a card" ran independently of the IIe—and more swiftly. Work that could be done faster, such as adding long columns of figures, was shifted to the 4-MHz coprocessor, while the 1-MHz Apple tackled slow jobs, such as communicating with peripherals and functions that depended on exact timing.

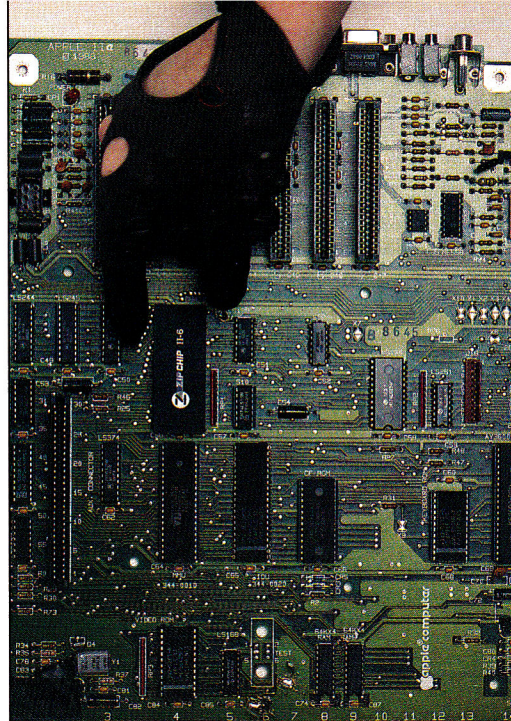
This system has drawbacks—running two computers simultaneously used a lot of power and generated a lot of heat. Other problems developed. Many Apple IIs have more than 128K of memory; to accelerate an Apple with 1 megabyte, you'd need an accelerator card with 1 megabyte. Memory chips aren't getting any cheaper, and accelerator cards that use them are becoming prohibitively expensive.

A BETTER MOUSETRAP

One accelerator card, the McT Speed-Demon, speeded things up with a twist. The SpeedDemon's designers (some of the same guys who would later design the Zip Chip) reasoned that because the microprocessor uses only a few bits of data at a time—and most of those over and over again—an accelerator card requires only a few kilobytes of RAM if it uses them only as necessary.

This technique is called *memory caching*. A few more kilobytes must be set aside, however, for remembering what's already in the cache. The difference between using cache memory and using 128K of random-access memory is like the difference between reading a road map of the area where you're driving and carrying around the *National Geographic World Atlas*: Which is quicker?

That's the background behind the Zip Chip revolution. What's new is that the designers can now squeeze the faster



65C02 and the cache RAM onto a single chip, a technique called *very-large-scale integration*, or VLSI.

Its developmental history explains two important advantages of the Zip Chip over other accelerators: It uses very little power, and it can address as much as 2 megabytes of auxiliary memory (if it's installed in the auxiliary slot).

BUT HOW DOES IT WORK?

Is the Zip Chip faster than other accelerator cards? It depends on what you're doing. I compared an Apple IIe with a Transwarp, an Apple IIGS, an Apple IIe, and an Apple IIe with a Zip Chip, running AppleWorks, ProDOS BASIC, and Zork Quest, a game from Infocom that uses lots of graphics.

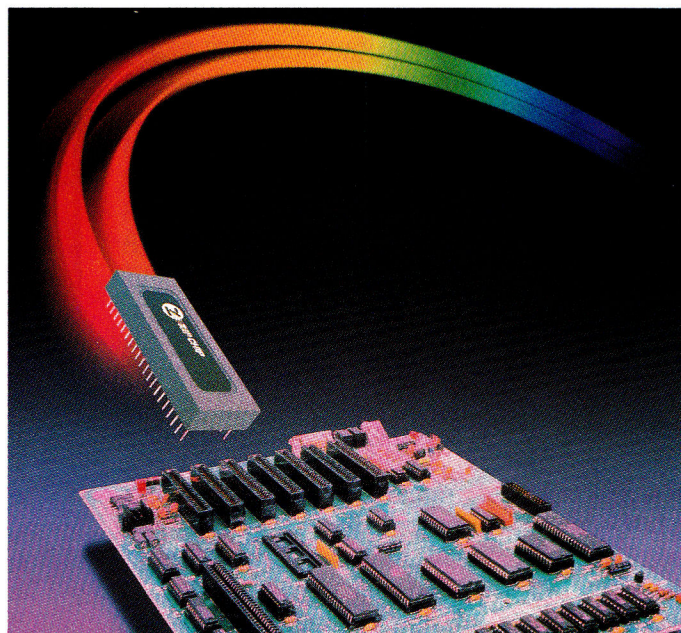
AppleWorks is fastest with the Zip Chip. BASIC is fastest with the Transwarp. I was most amazed by Zork Quest, which looked like an animated cartoon with Zip Chip support.

I should also point out that the three applications I timed do most of their work in random-access memory. In gen-

inCider's Ratings

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

The Word Is Out Zip Chip Is In



Zip Technology's original new microprocessor, the *Zip Chip*, vastly accelerates and transforms the Apple II series into one of the most powerful computer systems on the market... the fastest in its class!

The *Zip Chip* simply replaces your Apple II+, IIe, or IIC's 1 megahertz CPU and suddenly Appleworks is flying, processing data, crunching numbers! Print Shop runs at breakneck speed! Games are more exciting! Graphics come alive!

"I attacked the *Zip Chip* with every kind of software in inCider's library. Everything worked!"... "The *Zip Chip* may be the biggest thing to happen to the Apple II since the floppy disk drive!"

Paul Statt, Senior Editor, inCider Magazine

"The *Zip Chip* truly forms the bridge between the Apple II of yesteryear and the Apple II of tomorrow... forever!"

Richard Doherty, Computer Editor, Electronics Engineering Times (EET)

"The *Zip Chip* uses a substantially different technique for speeding up Apple II software... the same technique big computers use, called cacheing. Hurray for the *Zip Chip* and the changes it is sure to bring to the Apple II world!"

Peter and Allen Baum, Technical Editors, Call-A.P.P.L.E.

"After installing my *Zip Chip* and seeing it work, I can't even **think** about using my computer without it. We love it!"

Jay Wilbur, Editor, Uptime Magazine

"They said it couldn't be done, but Zip did it... and did it well!"

Paul MacMillan, Technical Editor, Nibble Magazine

"Wow! We're impressed! We plugged the *Zip Chip* into the computer running the Beagle Bros (modem) Pro Line tech support system... and everything worked **great**!"

Mark Simonsen, President and Mark De Jong, Technical Support, Beagle Bros

"I am **really** impressed with the *Zip Chip*! It dramatically improves Apple IIC/IIf performance!"
Brian Dougherty, CEO, Geos-Berkely Softworks

THE ZIP CHIP SAVES YOU TIME PLUS...

- + Gives your Apple II speed equivalency to IBM PC/AT 40% faster than the Apple II GS!
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eral, the more your application uses RAM, the faster the Zip Chip flies. The Zip Chip was made for AppleWorks with memory expansion, but a "disk-intensive" program like DB Master Version 5 will probably run fastest with a disk-caching system such as Ohio Kache Systems' Kache Plus.

I tested AppleWorks with a hard-disk drive, two 5¼-inch drives, a UniDisk drive, a clock, a modem, and an ImageWriter. I filled every slot but slot 3, and simply configured the Zip Chip to run slowly in those slots. In general, you have to be careful to configure the Zip Chip for your machine. For example, I ran a RAM disk in slot 4 at fast speed, but when I tried to use a real disk in slot 6, everything crashed. (The documentation warns you about this.) Nothing I did with the Zip Chip damaged anything on disk, however.

The documentation is sketchy, but adequate. If you want to run AppleWorks

(or SuperCalc3a, ProFiler, Point-to-Point, or any other application software), using a Zip Chip is as easy as turning on the machine. If you want to make changes in the configuration, though, you have to write a STARTUP program (or HELLO if you're still using DOS 3.3) to assign speeds to your Apple's various slots, the speaker, and the game paddles. You can even write a STARTUP program that turns the Zip Chip off completely.

The documentation goes into some detail explaining how to program the Zip Chip in assembly language. I resisted my first inclination to yawn and turn the page: This "open system" means that software developers will need to take only small pains to write programs that check the Apple II to see whether it's using a Zip Chip and configure it correctly if it is. After running Springboard Publisher with a Zip Chip and discovering that it's

a workable program after all (with a big RAM disk and a hard-disk drive, as well), I hope that a number of software publishers will make the small changes necessary to support it.

ZIP SUPPORT

Zip's technical-support staff was able and willing to help when I asked why I couldn't "warm boot" my system with the Zip Chip installed. Whenever I hit Open apple-Control-Reset, it returned me to whatever had been running. "That's a cold boot," helpful Mr. Zip in sunny California said to me, but added that he had heard of the problem.

It seems that to give the Zip Chip a few seconds to sort things out you have to hold down the open-apple key until you hear a beep. It even takes a few seconds (a second longer than a IIGS) to get started from a "cold boot," which I guess is a "warm boot" in Los Angeles.

I tried to dial Zip's electronic bulletin-board system, but woke up an angry Angelino with my 2400-bits-per-second beep instead. "No carrier" is the polite term for what he told me. (Zip admits it printed the wrong number in the documentation—the correct one is 213-473-8694.)

At least I could run Point-to-Point and CommWorks with the Zip Chip without a hitch (if not much faster—modems run at standard modem speed). I attacked the Zip Chip with every kind of software in *inCider's* library. I wanted to find something that didn't work, even if only to liven up this story. Everything worked. I discovered that some good games don't run on my enhanced IIe, and others don't like my doddering disk drives, but everything worked as well with the Zip Chip as it did without it, only faster. (I didn't try it in a II Plus because we don't have one.)

That's all I can say: The Zip Chip works. If it weren't so darned easy to install and use, I might complain about the manual, but Zip provides telephone support anyway. Note well: After 20 minutes using the Zip Chip and AppleWorks, you'll never notice the Zip Chip again. ■

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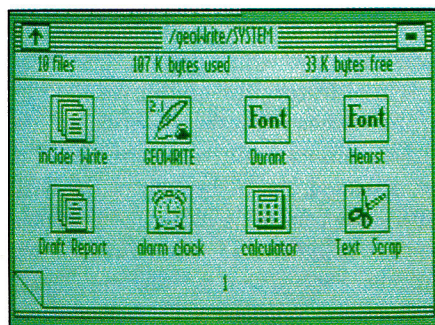
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A New Environment

GEOS

Berkeley Softworks, 2150 Shattuck Avenue, Berkeley, CA 94704, (415) 644-0883

Operating system, word processor (with dictionary, spelling checker, document merge, and laser-printer driver), paint program; 128K Apple IIe, IIc, IIGS (in emulation mode), Laser 128

\$129.95

Rating: ■■■■

Can GEOS—Berkeley Softworks' unique new Graphic Environment Operating System—give 8-bit Apple IIs an edge in the battle for more sophisticated software options? In the face of intense competition from bargain-basement MS-DOS clones, big-business Macs, and the sleek-and-fancy Apple IIGS, an easy-to-use graphics-based interface is the only the way to go. It's a little early in the game to predict the outcome, but its bold, sophisticated look makes GEOS a solid contender.

WHAT'S THE DIFFERENCE?

GEOS is Berkeley Softworks' 8-bit answer to the graphics environment you'll encounter in software designed for the Macintosh and the Apple IIGS: a user-interface system consisting of screen icons you indicate with a pointer and activate by "clicking" a mouse button or other input device (hence the phrase "point and click").

Is it complicated to set up on a IIe or IIc? Taken as a whole, GEOS can be a little overwhelming—especially for new users. It's a large package with a lot of

programs, procedures, and unfamiliar terminology to get used to.

With the documentation as your guide, though, learn the system one step at a time and you'll find there's nothing particularly difficult to master. The 269-page loose-leaf *GEOS User's Manual* is thorough, methodical, and technically correct—a rarity in these days of presumptuous, inaccurate documentation. It leads you step by step through each section and process; even novices can ignore the intimidating size and scope of the system.

The basic GEOS system consists of an interrupt-manager card, plus three double-sided 5¼-inch floppies. (According to Clayton Jung, project engineer at Berkeley Softworks, a new edition of GEOS on 3½-inch disks was in the works at press time and should be available this fall.)

Don't let the hardware scare you away: You'll need the interrupt-manager card (plugged into slot 7 on the IIe) only if

you're not going to use a mouse. Although you can work with GEOS from the keyboard (it's awkward) or a joystick (even worse), nothing beats a proportional mouse for operating a screen-icon-based system. Besides, not using a mouse with GEOS defeats the purpose of pointing and clicking—the primary benefit that distinguishes graphics environments.

The first GEOS disk contains the operating-system boot program on one side and the geoWrite word processor on the other. A backup copy of the GEOS operating system occupies side 1 of the second disk; side 2 holds geoPaint, a bit-mapped graphics drawing package. The third GEOS disk has a disk-based dictionary on side 1 and the geoSpell spelling checker (for use with geoWrite) on the flip side. All disks include numerous smaller files and lesser applications.

As the manual instructs, begin by serializing the master operating-system

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At a Glance

WordPerfect IIcs 2.0 (July 1988, p. 28), WordPerfect Corporation, 288 West Center Street, Orem, UT 84057, (801) 225-5000, \$179

Rating: ■■■■

WordPerfect GS is high-octane word-processing software worth taking out for a test drive. It's designed for professional authors and businesspeople. With more than 100 features and formatting options, learning to use WordPerfect can be daunting, but it's a powerful program.

WordPerfect GS includes built-in scroll bars, dialog boxes, option buttons, mouse support, and pull-down menus. Power users can choose a third alternative—to memorize keyboard equivalent commands. Instead of using the mouse to pull down the File menu and click on "Save as," or typing Control-Save A-Return to go through the Help menu's feature search, simply press an apple-S combination. You'll have to decide for yourself which interface works best for you.

WordPerfect GS features a large spelling checker (including word count) and a thesaurus. The program also lets you create and work with macros. WordPerfect GS supports plenty of printer alternatives to the ImageWriter II. It offers WYSIWYG (what you see is what you get) screen displays, although it doesn't support fancy fonts or color printing. WordPerfect GS has lots of wonderful features, but it will challenge you to negotiate a steep learning curve.

ComputerEyes for the IIcs (July 1988, p. 33), Digital Vision, 66 Eastern Avenue, Dedham, MA 02026, (617) 329-5400, \$249.95

Rating: ■■■■

ComputerEyes for the IIcs is a color video digitizer with two major components: a GS expansion card that converts analog video signals to your computer's digital data, and software to manipulate the data. The result is a system that lets you capture a video picture (from a VCR, videodisc player, video camera, or camcorder) and display it as an Apple IIcs picture.

ComputerEyes GS requires 512K. The digitizing board is a compact unit you can plug into any GS expansion slot. (The manual recommends you use slot 3, 4, or 7 to avoid conflicts with the machine's ports.) Note that ComputerEyes doesn't put out an RGB signal, so you can't preview the video source on the standard GS monitor.

ComputerEyes' software lets you make many changes in the images you've captured or those you've loaded from disk, including setting number of colors or grey levels, separation between colors, and capture speed. Within limits, ComputerEyes is a very good image-acquisition system. It lets you capture beautiful shots you can use with your GS software or modify with a paint program.

Continued

Boot disk (adding your name or your company's name, which the Boot disk will use to initialize the GEOS programs), then make backup copies of all six sides—you'll have to set aside the better part of an evening for this.

Your homemade copy of the current boot program works only if you crash in the middle of an operation, however. The original Boot disk or the official backup provided in the package are the only disks that can activate the system initially. You'll need one or the other every time you call up the current version of GEOS.

Worse yet, the Boot disk is notched, increasing the risk of an accidental format or inadvertent deletion of the boot sector. Call it nonsense or just copy-protection overkill, but for better or worse, vulnerable boot disks are a fact of life with the current version of GEOS. After serializing the master disk, write-protect it with a piece of tape before you go any further.

As noted above, Berkeley's Clayton Jung reported to *inCider* that the company is working on an upgrade version of GEOS, scheduled for release this fall. According to Jung, this new edition will remove copy protection from the master operating-system Boot disk; in addition, new on-screen prompts will streamline installation and serialization—you won't have to plow through the manual.

THE GEOS DESKTOP

Booting up the GEOS master disk takes only seconds and brings you right into the deskTop, the main operating system. You'll see icons representing all your files and application programs as well as input and output drivers—something like a graphics-based disk directory. Because the deskTop is memory—not disk—resident (making it an ideal candidate for Zip Chip acceleration, reviewed at the beginning of this section), even non-GEOS files created on your Apple appear on the deskTop. A particularly handy feature is that you can click on a data file created with an application such as geoWrite or geoPaint to boot that program as well as open the file.

Icons on the right-hand side of the deskTop show which drive is active—an essential feature for multidrive systems. Unlike other icons on the deskTop, the drive symbols require only one "click" to be activated. At the bottom of the deskTop screen there's a perpetual wastebasket for deleting files. You can also store inactive files in that area of the screen. You'll see a "dog-ear" or folded page corner in the lower left-hand corner. Maneuver the pointer there and click to turn through the pages of the deskTop.

THE SKETCH ARTIST

Graphics is what GEOS is all about, so it should come as no surprise that the basic GEOS package includes geoPaint, a full-featured graphics editor. Like most GEOS applications, you need to open either a new or existing file—in this case a geoPaint file—before using the program. When you exit geoPaint, though, the software saves automatically all changes you make in your file. Remove the disk from the drive after loading your file so that you won't alter your original creation unless you want to.

GeoPaint has a lot in common with other graphics editors using the point-and-click technique. Once you're in geoPaint, you can move the pointer around the screen and draw to your heart's content, then print, save, and reload your creations. It works especially well with a mouse. You can create finely detailed sketches with the wide range of brushes and fill patterns at your disposal. You're working in a monochrome environment, but GEOS' variety of patterns allows for shading within drawings. An opened-ended wrench on the top of the geoPaint screen toggles a menu of 16 selections that let you move the drawing area around the page; create boxes, circles, and lines; and incorporate text into your drawings, among other features.

The geoPaint disk also contains a set of desk accessories, including a notepad, calculator, alarm clock, photo manager, and text manager, all of which are also compatible with geoWrite. The Photo Manager lets you save graphics images

(but not actual photographs) in "photo albums" on disk. These graphics are called *scraps* and consist of any image you've copied or cut from a geoPaint screen. You can also incorporate them into geoWrite documents.

The Text Manager is similar, except that you're working with words instead of graphics images. Text albums are disk files that store text scraps, the chunks of text themselves. The Text Manager simply moves these scraps from one application to another, much like the AppleWorks clipboard.

WRITING WITH STYLE

A trio of GEOS programs handles all your text-management needs—geoWrite (a word processor), geoSpell (a spelling checker), and Text Grabber (a word-processor file-conversion utility).

Boot geoWrite to bring up the work screen, or writing window, with its command menu and ruler along the top. Like geoPaint, geoWrite always requires you to open a new or existing file (one file at a time) before you begin using the program. It would be nice to examine a little more of a file than just its name before loading it into memory.

The text area is referred to as a writing window because it doesn't span the entire

width of the screen: It covers the equivalent of 7 inches on an 8.2-inch-wide page. You can move the window about the page at will; a preview-page option displays a compressed version of the page that fits on screen.

While geoWrite is adorned with multiple fonts and a mouse-driven cut-and-paste system, it's hard to accept the current version of this program as a serious word processor. You can't type faster than 30 words a minute because the characters don't appear for a few seconds after you type them. The microprocessor's ability to process keystrokes is limited, while the screen shifts, moves, and re-adjusts itself constantly as you type. Even the lowliest nongraphics word processor shows you the results of your typing instantly. At press time, however, Berkeley was promising faster text entry in the new version of geoWrite scheduled to appear this fall.

Moving on to geoSpell, things get a little better. It's relatively painless to use. You can either build your own expandable dictionary, or use the standard geoDictionary. Copy the geoWrite file you want to spell-check to the disk containing geoDictionary or geoSpell, even if you're using a two-drive system. If you don't use a personalized dictionary, the

system reads geoDictionary into geoSpell along with your document.

The program prompts you to accept or replace every word not in the dictionary or every occurrence of the word in question. Using a mouse for input, this process is fairly rapid. You can also scroll through geoDictionary for words of similar spelling. The program saves a checked copy of your geoWrite document when you're done.

If you already own some other word processor and want to enhance your existing ProDOS documents, you'll love Text Grabber. This utility comes on the geoWrite program disk and will convert ProDOS word-processor files to GEOS-compatible files. Booting Text Grabber from the deskTop gives you four conversion choices—AppleWorks, MultiScribe, WordPerfect, and generic files.

WORD-PROCESSING EXTRAS

Two other utilities round out GEOS' selection of text-management programs. First, for sophisticated type quality, the geoLaser printer driver works in conjunction with geoWrite to run your LaserWriter.

Second, GEOS' geoMerge software reads data from one geoWrite document and inserts it into a second, creating easy form letters.

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Let's say you're running for mayor. You want maximum voter support, so you'd like to do a mailing of 200 form letters to influential residents and businesses, and you want your Apple to personalize them. Just boot up geoMerge and let GEOS read the names and addresses from a previously created geoWrite document configured as a mailing list. If you've met some of the people on your mailing list, you can insert that information—including a specific date—then send your letters with personalized

names, addresses, salutations, and comments to the printer.

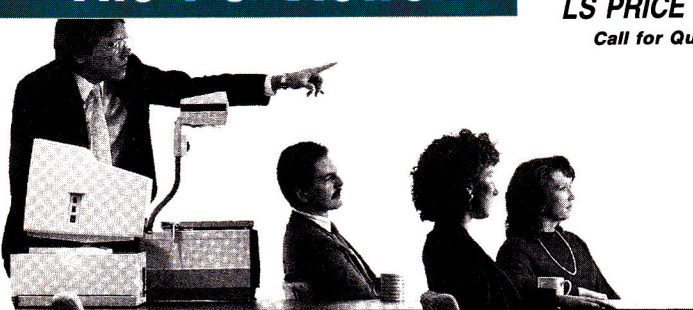
WHERE DOES GEOS GO FROM HERE?

Its sluggish word processor notwithstanding, GEOS is a reliable software package that will complement any Apple IIc or IIe. And with the wide range of programs the basic system offers, the GEOS package is a bargain. More GEOS applications (spreadsheet, database, and so on) are


promised in the near future; *inCider* will keep you posted as they become available. Thanks to GEOS' innovative mouse-operated applications, Apple IIes and IIcs will be giving fancier machines a run for their money for a long time to come. ■

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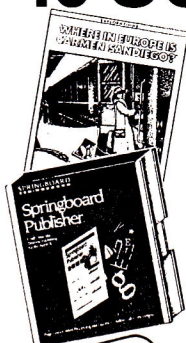
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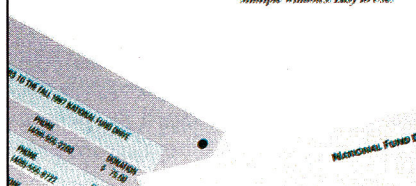
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Rating: ■■■■

Everybody's familiar with the word *list*, and most people these days have heard the term *database*. In List Plus lingo, a list is a database, a collection of information, and List Plus lets you manipulate it within the familiar GS mouse-and-menu interface.

As in other database managers, a List Plus database is a group of *records*. Each record is made up of *fields* containing the actual data. To take an everyday example, a handful of index cards with addresses and other information is a "list," and each individual index card a record. The data on the cards are broken up into

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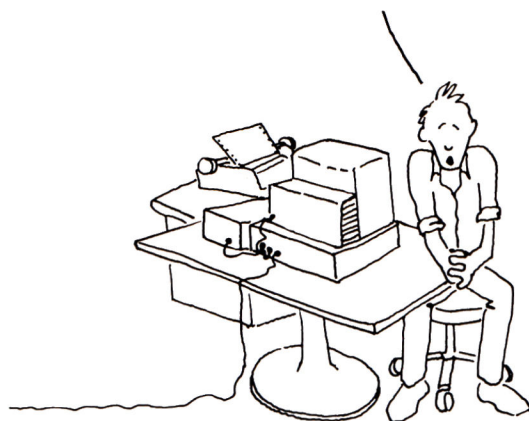
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Touch 'N See (June 1988, p. 42), Personal Touch Corporation, 4320-290 Stevens Creek Boulevard, San Jose, CA 95129, (408) 246-8822, \$39.95
Rating: ■■■■

Touch 'N See is one of the Windoware programs that work with the TouchWindow screen-input device, also from the Personal Touch Corporation. If your kids like the game *Concentration*, they'll love Touch 'N See. While they concentrate on making matches, they learn to recognize shapes, objects, upper- and lowercase letters, numbers, and words.

Touch 'N See teaches a half-dozen basic shapes: circle, square, cross, diamond, rectangle, and triangle. Objects are arranged in categories such as Clothes, Outside, Kitchen, Animals, Body Parts, and Travel. Children can work against an electronic timer or with no time limit at all.

Touch 'N See with the TouchWindow provides a nearly ideal way for children to master the prerequisites of first grade—recognizing numbers, letters, shapes, common objects, and their names.

Touch 'N Match (June 1988, p. 45), Personal Touch Corporation, 4320-290 Stevens Creek Boulevard, San Jose, CA 95129, (408) 246-8822, \$29.95
Rating: ■■■■

Touch 'N Match is a great follow-up to Touch 'N See. The three activities here challenge kids to match identical shapes or objects or point to an object that belongs or doesn't belong with a certain group of items.

The program ignores incorrect responses, but rewards correct ones with music and graphics. You can configure each game for 10, 20, 30, 40, or 50 problems. At the end of each game, a score card lists the number of correct and "missed" responses.

Timekeeper (June 1988, p. 45), Personal Touch Corporation, 4320-290 Stevens Creek Boulevard, San Jose, CA 95129, (408) 246-8822, \$39.95
Rating: ■■■■

Timekeeper uses the TouchWindow input device to teach children how to tell time. In the first of four activities the child sets the hands of a clock to match the time on a digital display by touching the up or down arrows on the screen.

The second activity is similar, but instead of changing the hands, kids have to match the time on the digital display to a time displayed in words—such as "five after ten." In the third game, called Type in Time, the screen shows the time on an analog clock. Boxes across the bottom of the screen display the numbers one through nine, zero, and the colon symbol. The child presses the numbers and the colon in the proper sequence to display the digital equivalent of the time on the analog clock. (The child can also use the keyboard here.)

The fourth part of the program, Time Match Game, shows the time on an analog clock. The child chooses a matching time from one of four digital-clock readouts. This activity is timed—when a plunger on the right-hand side of the screen reaches the bottom and crushes an alarm clock, time is up. You can set the time of the game in increments of one hour, 30 minutes, 15 minutes, five minutes, and one minute.

As a team, the TouchWindow and Windoware programs can be a great help to your preschooler, learning-disabled child, or ESL (English as a second language) student. □

End

distinct fields, such as *city*, *state*, and *zip code*. The benefit of putting this information into a database, though—as opposed to writing it on index cards—is that you can search through it, sort it, manipulate it, or print it in any number of ways—and List Plus makes it easy.

ON RECORD

List Plus is a Macintosh-style database manager and report generator for the Apple IIGS, designed by Version Soft and marketed by Activision. It comes on a single 3½-inch disk and requires a minimum of 768K of RAM. (The more memory you have, of course, the larger the potential size of your databases.) Since the List Plus disk isn't copy-protected, you can make backup copies and install the program on a hard-disk drive.

The total number of possible records in a List Plus database is limited only by the amount of free memory in your Apple. On my 1.25-megabyte system, no desk accessories, no RAM disk, List Plus indicates that 743K is available, which should hold about 1547 records. That's an approximation based on such factors

as number of fields per record, width of columns, complexity of calculations, and so on.

When you boot the program, an eight-item menu bar appears at the top of the screen and a data-entry window opens below. The majority of the screen is occupied by an empty list window. You can enter data in this window right away, or load a previously saved list. You can have up to four list windows on the GS Desktop simultaneously.

List Plus can display your database in either index-card (form) or spreadsheet (column) format. You can switch instantly between the two displays without affecting your data. In column format, the screen shows rows (records) and columns (fields) like a spreadsheet—up to 13 records on one screen. Using the horizontal and vertical scroll bars, you can jump to any part of a list. It's also easy to rearrange your list with the cut-and-paste options in the Edit menu. You can use the mouse to resize, move, even copy entire columns within a list, or export them to another.

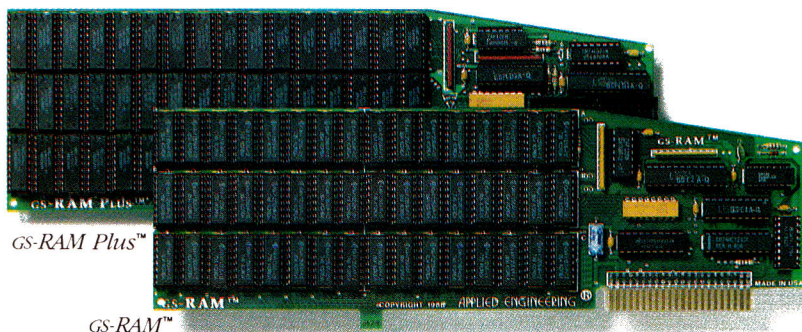
FORM OR FUNCTION

When you switch to form, the entire screen is devoted to a single record, with fields arranged as they would be on an index card. You can have up to four different forms for each list. The ability to create multiple forms for the same database is particularly useful: You can generate several different reports from the same information.

To define a form, use the mouse to hide, move, resize, and add nondata fields (information that remains the same in all records, such as a comma between state and zip-code fields). Designing a form can be difficult—there's no "snap to" grid to ensure that all fields line up perfectly.

Eight predesigned forms—a name-and-address file, class roster, customer file, student grade form, home and business inventory file, membership list, and files for recording important document numbers—let you experiment. These templates are already formatted and set up with field names; just plug in your values and go.

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Regardless of whether you prefer form or column format, each field has its own data-entry and display attributes. Data-entry attributes determine the type of information you can enter into a field: alphanumeric, alphabetic, numeric, or digits only. For example, if you specify "digits only" for a zip-code field, your GS will beep if you inadvertently try to enter anything other than a number.

Data-display attributes determine how your data will appear on screen. They don't affect actual values. List Plus can display your data automatically in specified numeric, date, time, monetary, or phone-number formats. To set data-display attributes, you simply select the desired format from a dialog box of buttons.

You can use 12 relational operators (including Boolean) in conjunction with one another to display only those records with the attributes you specify. For example, you can select records in which the sales

field is greater than \$500 and the credit field doesn't include the word *poor*. In addition, you can sort a list on any field in ascending or descending order.

FEATURED ATTRACTIONS

The 202-page spiral-bound manual provided with List Plus contains an excellent guided tour, as well as an exhaustive reference section, glossary, and index. The documentation is exemplary in scope and detail. The guided tour uses sample databases (thoughtfully included on disk) to illustrate the program's many features.

One particularly useful option is the software's ability to perform simple calculations on columns. List Plus can display total, minimum, maximum, and average values below a numeric field. While column calculations are useful, they provide information only on entire lists.

The program can also count the number of records containing data in any

particular field you choose, and use information from other cells in the same record to create calculated fields. This option gives you limited spreadsheet capabilities within your database.

You can use constants, field variables, and algebraic functions to create complex formulas. In addition to the standard arithmetic operators, 20 special functions include items such as a random-number generator, date manipulators, square root, and so on. You could, for example, determine penalties on overdue accounts by using date functions to compute the value and age of accounts receivable and multiplying the result by a specific rate of interest.

When you're satisfied with the content and format of your database, you can save it in List Plus or ASCII format. If you choose the latter, you can export your list to AppleWorks or any other program that can read straight text files. You can save only raw data in ASCII format, how-

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ever; all data-entry and display attributes are lost. List Plus can also read AppleWorks database files directly; it converts them automatically to List Plus format as they load, however.

Notably missing from the available features is a built-in graphing function, as well as the ability to cut and paste selected cells. If you're willing to export your lists to other applications, though, enterprising users can perform these tasks.

Just as you can display your database as either a list or form, so too can you print it. If you choose the Print option from the File menu, the database will print in the current format. On the other hand, Print Quicklist always prints every record in list format. You shouldn't use this option if you need to print only selected records.

To print forms, use custom-report format. As mentioned earlier, you can define as many as four forms for a single

database. Each form carries an accompanying custom report, a form printed with a header or footer or both. Headers and footers are limited to one line, and can include text, the date, and page number if you prefer.

When printing a custom report, you have the option of printing single or multiple records per page. If you choose the latter, you can instruct List Plus not to break records over the page perforation, to keep records intact for a clean, easy-to-read report. Unfortunately, there's no way to print a single record without first selecting it with a search string unique to that record. I'd like to be able to select a record in list mode, switch to form, and print only that record.

List Plus is a WYSIWYG (what you see is what you get) program, and as a result, generates all hardcopy in your printer's graphics mode. The problem is twofold. First, you can't change the style or size of

the font; you're stuck with a large, unattractive default font. Second, the supplied Apple print drivers are unbearably slow and don't always function properly.

For example, to print an address list with 48 records on an ImageWriter II in standard size, high-quality mode took more than 11 minutes with only 32 records per page. Printing the same list in draft mode required less than a minute, because draft prints in text, not graphics. The list was double-spaced for no apparent reason, though. Activision claims the problem lies with Apple's print drivers.

Without the ability to select font style and size, I see no reason to use snail-paced graphics mode. I'd like to be able to print in fast text mode, without extra linefeeds. One solution is to save the list in ASCII form and use Beagle Bros' TimeOut SuperFonts to print it. If the drivers are indeed faulty, however, Apple should fix them.

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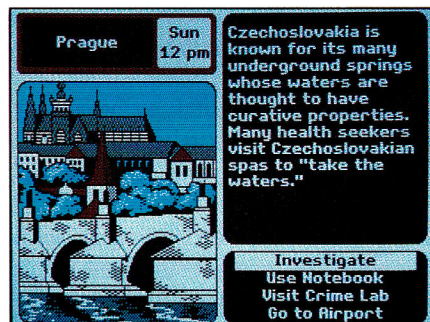
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Circle 290 on Reader Service Card.

REVIEWS

The GS' mouse interface provides much of the ease of use previously afforded only to Macintosh owners. List Plus may not be the definitive database manager and report generator, but it's powerful enough to satisfy all but the most demanding personal or small-business user. ■

Owen W. Linzmayer
Morris Plains, NJ



On the Loose Again

WHERE IN EUROPE IS CARMEN SANDIEGO?

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Rating: ■■■■

To me she is always *the* woman. Carmen Sandiego, the globe-trotting gangster who led learners on a wild-geese chase in Broderbund's popular *Where in the World Is Carmen Sandiego?* and its sequel, *Where in the USA Is Carmen Sandiego?*, is at large again. (Clearly, no jail can hold her.)

This time, Carmen and a new horde of henchpersons are stealing the treasures of Europe—Count Dracula's toothbrush, the keys to the Common Market, and every geyser in Iceland, to name a few. Grab your atlas and check out the new tools in the Crime Lab. It's time to match wits with the criminal mastermind once again.

Where in Europe Is Carmen Sandiego? (henceforth referred to as *Carmen III*) follows the same basic plot as its predecessors. Working for the Acme Detective Agency, you're sent ping-ponging across the continent after a mystery villain. At each stop along the route, you'll find educational facts about that country, hints as to the thief's next stop, and clues to his or her identity that should help you assemble a valid arrest warrant by the time you catch up with the culprit.

If you successfully find and arrest the crook before your deadline expires, you're given another challenge and perhaps a promotion, working your way up the ranks until you confront the kleptomaniacal Carmen herself.

This routine has worked before and it works in *Carmen III*. Loyal Sandiego fans may have a few complaints and even newcomers may get a feeling of déjà vu before they get Carmen into court, but some program improvements help pep up the familiar formula. Most importantly, *Carmen III* combines a lot of educational value—both in information about Europe and in problem-solving skills—with the fun of a detective game.

FEWER FRILLS, NICER CONTROLS

Admirers of Carmen's earlier adventures taking their first look inside the new package may think that either Broderbund or the Acme Detective Agency is on an economy drive. The reference guide supplied with the program, Rand McNally's *Concise Atlas of Europe*, is far slimmer than the *World Almanac* and *Fodor's USA* volumes bundled with *Carmen I* and *II*, respectively. (It's therefore easier to use as you track criminals—it's less crowded with extraneous data.)

There's a handy, witty map, but most of the new bandits, though they continue the tradition of clever names such as Luke Warmwater and Clare d'Loon, are identified only by scanty sketches and captions. I miss the rogues' gallery of photos and descriptions found in *Where in the USA?*

The program gives you frequent glimpses of Carmen's V.I.L.E. henchmen, but the disk and documentation forget to tell new detectives what the name stands for (Villains' International League of Evil). Also, my review copy rewarded my success with an inexcusable spelling error in an on-screen message: "You're new rank is Junior Investigator."

On the positive side, Carmen III, while easily recognizable to former Acme investigators, includes extra features and the best-organized game controls of the series. As before, the main playing screen shows your current location, the date and time, a handsome "snapshot" of the city (with occasional touches of animation, such as a spinning windmill or yawning Swiss Guard), and a fact or two about the city's or country's geography, economy, or history.

Below is a menu of options—Investigate, Use Notebook, Visit Crime Lab, or Go to Airport. The last sensibly combines what used to be two separate choices: See Connections (the thief's possible destinations) and Depart by Plane (following in the foe's footsteps).

Each activity on the Investigate sub-menu (Question Witness, Search Scene, Call Tipster) brings a clue to the thief's location—the suspect may have offered a bribe of 20,000 leks, carry a French dictionary, or have "a contact in Kiskunfelegyhaza" or "a deep-seated fear of Viking raids." Scurrying through the maps and text of the atlas, you should be able to discover his or her destination—perhaps the final hideout and arrest site or maybe just another stop on the trail.

Meanwhile, your Chief sends frequent bulletins or hints to help you fill out a warrant, narrowing the list of suspects by finding your quarry's sex, hair and eye colors, and taste in movies and books. Rather than having to feed such factors into your Crime Lab computer one by one as in the earlier games, you keep them in a notebook and enter them into the computer in one gulp.

The Crime Lab's classiest new feature is its computer database, an on-line guide

to winnowing the 34 nations of Europe by up to three criteria—flag colors, currency, and language. You can find a country with a red, yellow, and black flag, or those whose citizens speak Flemish and spend francs. Selecting criteria, like entering character clues or commands, is an easy matter of using the arrow and return keys or a joystick. The database is such a delightful addition that I wish more cases required its logical analysis instead of simply use of the atlas' index.

CRIME STILL PAYS


As always, it's a good thing you can save a pursuit in progress; it takes a lot of detecting to catch the slippery Ms. Sandiego. Along the way, while the descriptions of countries and cities remain varied and interesting, each case can send you to half a dozen or more of the 34

target cities; while Broderbund claims almost 1000 randomly reshuffled clues, marathon players will grow tired of the same hints and henchmen popping up on screen. (To be fair, students taking turns for a case or two at a time won't have this gripe.)

In short, Carmen Sandiego's life of crime and constant jailbreaks are taking their toll, but even as she shows her age a little, she's got new tricks up her sleeve. Where in Europe Is Carmen Sandiego? is a welcome addition to the series, and should be as big a hit as its predecessors. ■

Eric Grevstad
Keene, NH

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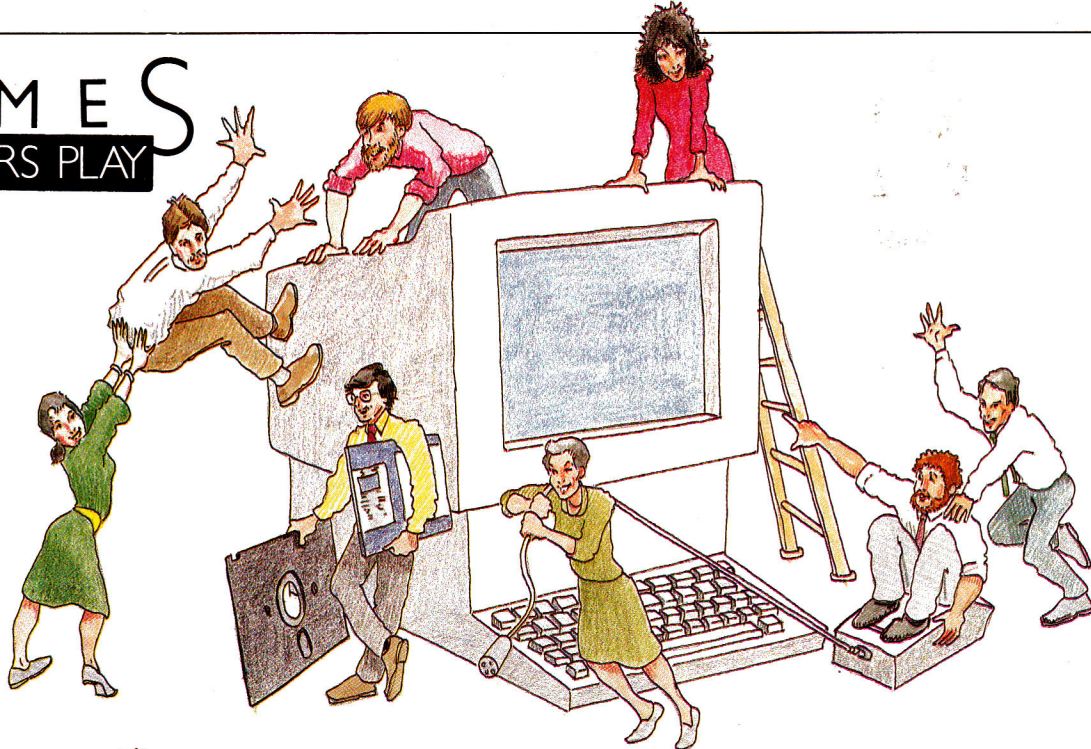


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A hyperintelligent alien has taken over the space station and is throwing everything it can in your direction. It has reprogrammed all the space station's defense systems and work robots. All sorts of multicolored, multishaped beings are out to get you. The only person left alive in the station (besides you) is your friend Aaron, who's hiding and can communicate with you only through various terminals located throughout the station.

Along the way you can pick up first-aid supplies and extra cartridges for your weapon. You can also hop on an energy saucer (which makes it easier to get around), pick up an energy shield (which makes you invincible to blaster fire), or turn on a conductor (which sends a power surge through the sta-

tion and slows down all the electronic buggies that are after you). Through the clues Aaron gives you at the terminals, you also find elevator passes and key cards (to get through doors).

The Zekford space station is a horrific maze of corridors full of dazzling, dangerous denizens. Even if I didn't have to shoot my way through, it would take some doing to find Aaron and finish off the alien. If I ever do get to that point, I'll let you know how I do.

Pat Payne plays . . .



Ticket to Washington, D.C., Blue Lion Software Corporation, 90 Sherman Street, Cambridge, MA 02140, (617) 876-2500. \$44.95.

This program had me stumped. The latest in Blue Lion's series of travel games is in some ways the easiest one and in other ways the hardest.

Ticket to Washington revolves around a simple premise. You're visiting the city on a mission—you're trying to guess the identity of a famous American. To that end, you can earn clues by answering questions correctly. Each time you visit a different place you'll be stopped and asked a few quick ques-

tions—about artists when you visit the National Gallery, for example. It's a little like *Trivial Pursuit* on disk and will probably do wonders for your prowess in *that* game.

Ticket to Washington uses a simpler method of game play than earlier games in the series. Unlike Ticket to London, for example, you don't have to remember to return to your hotel each night and you won't collapse from exhaustion if you walk around too much. In Ticket to Washington, time simply passes. When the clock in the lower right-hand corner reaches 10 p.m., the day simply ends and it's automatically 10 a.m. the following day.

The clues in Ticket to Washington are much harder than those in the previous games. The leads I got made no sense to me—and they still don't. ("Only you can prevent forest fires.") This isn't really a flaw, however, because if you play the game long enough, they'll start to come together. And this game is designed to be played repeatedly; it's as much a learning tool as a game. It's designed to give you a working knowledge of the city and that doesn't come in the first five minutes.

I can imagine children playing this game before a school trip to Washington; I can also imagine their parents wanting to give it a try.

Paul Statt plays . . .



Leisure Suit Larry in the Land of the Lounge Lizards, *Sierra On-Line, P.O. Box 485, Coarsegold, CA 93614, (209) 683-6858. \$34.95 (GS only).*

Why did I play Leisure Suit Larry in the Land of the Lounge Lizards to the bitter end? Why did I join Larry's late-night rambles through the bars, discos, gambling dens, liquor stores, and hotels of Sleazy City, USA?

Did I do it because I happen to think that Hunter S. Thompson's Las Vegas

is more fun than medieval England, or Zorkland, or wherever it is that all those interminable adventures take place? Picking up girls is more fun than saving the world from monstrous evil creatures, but that's not why I finished.

Did I do it because the graphics are great? The people look real and the animation is workable (especially if you don't mind keeping one hand on the mouse, one on the joystick, and another on the keyboard), but that's not why I finished.

Did I do it because after frustrating myself into a frenzy I finally realized

that Leisure Suit Larry, like every other adventure game, makes just two simple demands ("talk to everybody, even bums" and "pick up everything you can")? Did I do it because remembering to spray breath freshener into my mouth every hour or so is my idea of an intellectual challenge?

No, I fought the fight for Leisure Suit Larry because I thought I would see a pretty girl as God made her if I finished. I finished Leisure Suit Larry in the Land of the Lounge Lizards, but nobody got naked. I guess "the play's the thing," not my puerile curiosity. But I was disappointed. ■

Short Takes . . .

Gamma Force in Pit of a Thousand Screams

■■■■■

Infocom, Inc., 125 CambridgePark Drive, Cambridge, MA 02140, (617) 492-6000 or (800) 262-6868 (orders only). \$12.

An animated comic book well worth the \$12 price tag. You can explore different plot lines by following different characters. A sci-fi adventure with a humorous twist. (See Games Editors Play, July 1988, p. 38.)

Destroyer GS

Epyx, P.O. Box 8020, 600 Galveston Drive, Redwood City, CA 94063, (415) 366-0606. \$39.95.

The GS version of this already super game has much crisper graphics and incredible sound. Look out when your ship is dive-bombed by Ze-ros—the ensuing explosions are deafening. (See Games Editors Play, July 1988, p. 38.)

Ikari Warriors

■■■

Data East, 470 Needles Drive, San Jose, CA 95112, (408) 286-7074. \$34.95.

This home-computer version of the arcade game (a genre for which Data East is widely known) doesn't quite match the game you'll find in video palaces and pizza parlors. It's entertaining, but the graphics could be improved.

Pharaoh's Revenge

■■■

Publishing International, 333 West El Camino Real, Suite 222, Sunnyvale, CA 94087, (408) 738-4311.

\$29.95 (5¼-inch disk), \$32.95 (3½-inch disk).

Arcade action: Build ladders and climb out of the pyramid before the mummy catches you. Looks easy, but gets impossible fast. (See Games Editors Play, July 1988, p. 39.)

Cavern Cobra

■■■

PBI Software, Inc., 1163 Triton Drive, Foster City, CA 94404, (415) 349-8765 or (800) 843-5722. \$49.95.

A fastpaced arcade-style helicopter simulation. Since it's a GS game, the graphics screens are great, but it's very slow to load. Flying is awkward—you control your helicopter with the mouse and your artillery with a combination of number keys and mouse clicks.

Border Zone

■■■

Infocom, 125 CambridgePark Drive, Cambridge, MA 02140, (617) 492-6000 or (800) 262-6868 (orders only). \$39.95.

Three short interactive stories about a spy trying to escape from behind the Iron Curtain. You can ask for hints if you get stuck, which is a big help for beginners. (See Games Editors Play, April 1988, p. 42.)

California Games

■■■■■

Epyx, P.O. Box 8020, 600 Galveston Drive, Redwood City, CA 94063, (415) 366-0606. \$39.95.

Surf, skateboard, frisbee, roller-skate, bicycle, and hacky-sack your way through the Golden State in this wild collection of games. Joystick strongly

recommended. (See Games Editors Play, February 1988, p. 37.)

Street Sports Basketball

■■■

Epyx, P.O. Box 8020, 600 Galveston Drive, Redwood City, CA 94063, (415) 366-0606. \$39.95.

A game that brings back memories of playground glory. Lots of fun, but not as challenging as it might be. The game doesn't quite live up to its concept. (See Games Editors Play, August 1988, p. 49.)

Gauntlet GS

■■■

Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667 or (800) 221-9884. \$44.95 (\$39.95 Apple IIe/IIc version).

A simple arcade game where you race against the clock (in this case your short life) to accumulate as many points as possible. Fun, but the graphics screens need improvement. Joystick recommended. (See Games Editors Play, August 1988, p. 49.)

ZorkQuest

■■■■■

Infocom, 125 CambridgePark Drive, Cambridge, MA 02140, (617) 492-6000 or (800) 262-6868 (orders only). \$12.

The final Infocomic of the three introduced, although Infocom promises more (in the form of sequels) to come. Maintains the same high level of quality and fun seen in the first two—buy it! □

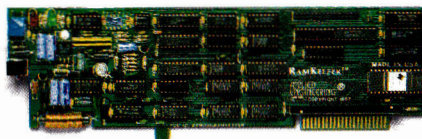
In about the time it takes to read this headline, you can have the Finder up and



Imagine. Turn on your IIgs and instantly the finder comes to life! All the speed and RAM power your IIgs was meant to have, packed into one, affordable "electronic hard disk."

Applied Engineering's RamKeeper.[™] A system that works like a hard disk, only better. It retains stored programs *and* data while your computer is turned off (like a hard disk), but gets up and running five times faster. RamKeeper is solid state, has no moving parts and, unlike a hard disk, has no heads to crash and no parts to wear out. And RamKeeper saves wear and tear on your disk drive, because you don't need it nearly as often.

RamKeeper even powers up to two



RamKeeper lets you keep programs and data in permanent, "electronic hard disk" memory. Turn your Apple IIgs on and you're ready to work.

memory cards *simultaneously* while your computer is off. And the battery backup we include keeps power to the boards, even during power failures.

Your programs and data remain stored in a permanently accessible state, always ready to run. Your computer waits for *you* . . . instead of you waiting for it.

Superior power backup.

RamKeeper comes complete with sealed Gel/Cell batteries for emergency backup in the event of a power outage. Gel/Cell's are by far the most reliable backup power source in this application. Unlike the Ni-Cads others use, Gel/Cell batteries don't lose capacity if not discharged periodically.

Our Gel/Cell pack gives you up to six hours of total power failure backup. And the sealed battery pack stays *outside* your computer case, where an unlikely leak won't ruin your computer circuitry.

RamKeeper uses a Switching Power Supply — the same technology used by Apple for the IIgs power supply. This design uses energy much more

efficiently to keep your Apple running cooler.

Powers two memory cards in the same slot.

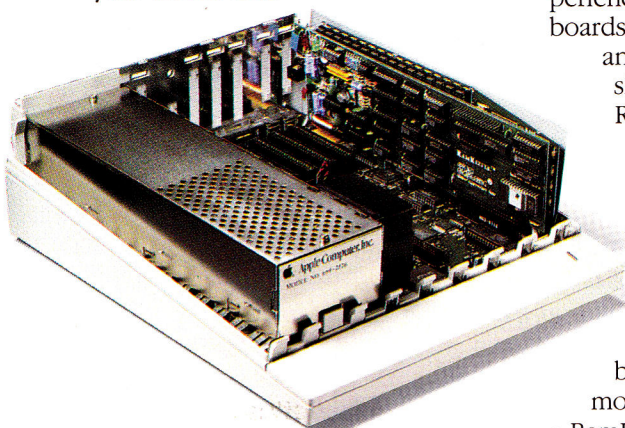
Have Apple's memory card, but now want the features of Applied's GS-RAM card? With RamKeeper, both cards act as one larger card. In one slot. Just attach one memory card to each side of RamKeeper and plug RamKeeper into the slot. And even with two cards, you can still keep slot 7 open with our optional Slot-Mover. All without changing the way either your memory card or your software now operate.

RamKeeper also works fine with only one memory card.

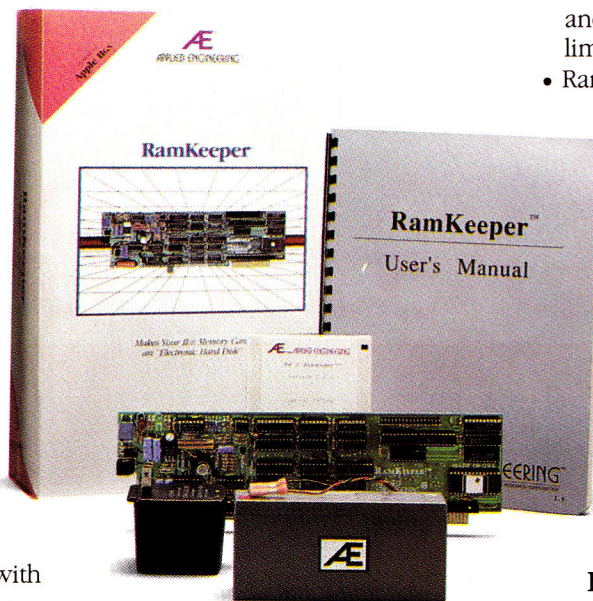
Makes all your memory usable memory.

RamKeeper powers up to 16 Meg. of memory. You can also mix and match different types of memory cards. For example, an Apple card that uses 256K RAM chips and an Applied Engineering card using 1 Meg. RAM chips. RamKeeper firmware automatically configures for two cards when the second card is installed. No need to manually move jumpers.

RamKeeper configures memory linearly to avoid memory gaps that can cause crashes. And *you* decide how much memory to devote to ROM and to RAM from the IIGS Desk Accessories menu. You can configure Kilo-bytes or Megabytes of instant ROM storage for your favorite programs. And you can change ROM and RAM sizes at any time without affecting your stored files.



RamKeeper is easy to install. Just plug it in. Even when you use two memory boards, you don't have jumpers. You can have two memory boards but use only one slot.



It all comes with RamKeeper ... board, Gel/Cell battery pack, easy-to-understand instructions, and Applied's powerful AppleWorks Expander software.

Protect from program crashes.

Reinstalling operating software is not fun. With RamKeeper you'll never have to. Since RamKeeper controlling firmware is in an EPROM, a program crash can't take out the operating software.

Verifies data security.

RamKeeper firmware uses optional startup checksums to verify that no data was lost while the power was off. The firmware also runs ROM and RAM memory tests without disturbing data on the card.

Significant differences.

Applied Engineering's longer experience with battery-backed memory boards shows in the way we designed and built RamKeeper. There are significant differences between RamKeeper and other systems:

- RamKeeper includes a Gel/-Cell battery for 6 hours of total power failure backup, others use the shorter-life Ni-Cads and charge extra for them
- RamKeeper has external battery storage, others have a more risky internal storage
- RamKeeper powers up to 16 Meg., others power only up to 8 Meg. maximum
- RamKeeper permits mixing and matching different memory cards

and chip sizes, others have more limited combinations

- RamKeeper automatically configures for two cards, others have manually-moved jumpers
- RamKeeper configures linearly to eliminate memory gaps, others don't
- RamKeeper includes EPROM-protected operating software, others use floppy installation
- RamKeeper's software expands AppleWorks internal limits, others don't
- RamKeeper includes disk-caching software, others don't

Free AppleWorks Enhancement software.

Applied Engineering's powerful AppleWorks Enhancement software comes free with RamKeeper. It's well worth the purchase price alone. Our software makes AppleWorks faster and far more powerful by eliminating internal memory limits. Word processor limits increase from 7,250 to 22,600 lines. Database limits increase from 6,350 to 22,600 records. Clipboard limits increase from 255 to 2,042 lines. Our software even automatically segments large files so you can save them on multiple floppies.

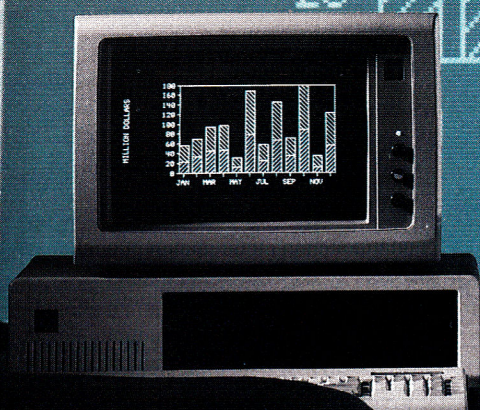
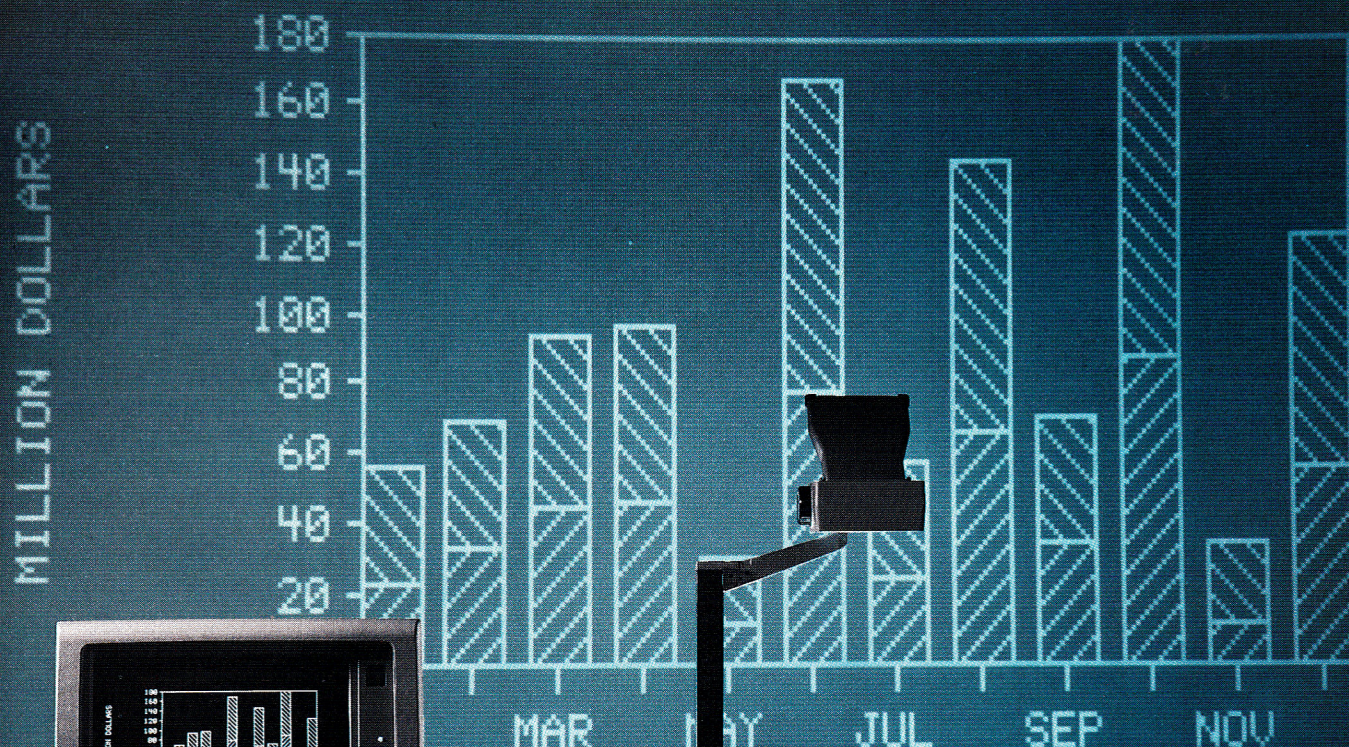
In addition, RamKeeper comes with the most powerful disk-caching program available anywhere. The cache tremendously accelerates access time to the Apple 3.5 Drive. Creating, in effect, a speed booster on top of a speed booster . . . a potent combination that runs most applications up to *seven times faster*.

RamKeeper is proudly made in the U.S.A. and is backed with a five year parts and labor warranty. And a 15-day money-back guarantee.

Only \$189.

To order or for more information, see your dealer or call (214) 241-6060, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA, C.O.D. welcome. Texas residents add 7% sales tax. Add \$10 outside U.S.A.

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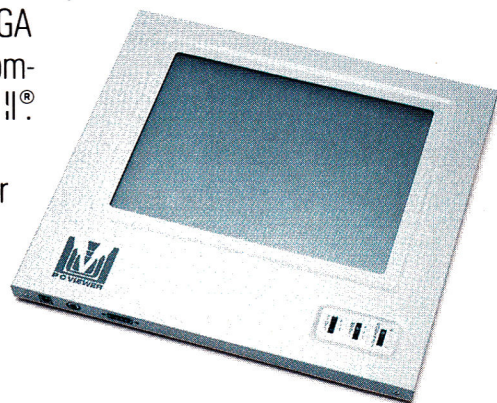
At last, spreadsheets become readable. Graphics understandable. The PC Viewer's 640x200 resolution consistently delivers an excellent monochrome image, even at high magnification. And it connects directly to your PC's graphics adapter, with no modification required.

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TOP 40 SOFTWARE HITS FOR HOME EDUCATION



Compiled by Cynthia E. Field, Ph.D., Contributing Editor

Preschool through high school, kids have pushed Apple II home-education software to the top of the charts. Whether they're into art, science, logic, or the three Rs, Apple II programs stimulate their curiosity, fire their imaginations, and, best of all, make learning fun. Check out inCider's list of all-time favorites.

Is there some leeway in your back-to-school budget this year? Besides pencil cases and notepads, why not equip your children with some award-winning home-education software? Any one of these cream-of-the-crop programs can enhance your children's schoolwork during the coming ten months.

Best of all, most of the programs in our "Top 40" cost less than name-brand high-top sneakers—and don't wear out as fast. In fact, many products provide variable levels of difficulty so that you can tailor programs to "fit" all the children in your family. Customizing options make good values even more valuable. (See the accompanying sidebar "The Elite Eight," pp.

64–65, for the best program *series*, too. And don't forget to check the "Public-Domain Grab Bag," p. 50, for free and shareware programs.)

We've grouped our "Top 40" programs into six curriculum areas: thinking skills, fine arts, language arts, math, science, and social studies. Use these categories as guides, but remember that some programs overlap areas. Within each category, software for preschoolers is described first, followed by programs for older children. (See the accompanying box for company addresses and phone numbers.)

THINKING SKILLS—IT'S LOGICAL

Facemaker (Golden Edition)

Spinnaker Software

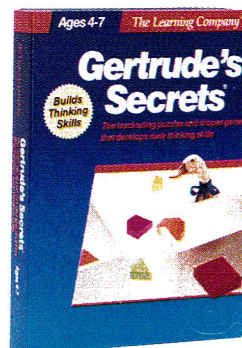
System: 64K; color monitor and printer recommended

Ages 3-8

\$39.95

Facemaker is a caricature-construction set and computer-literacy program for children as young as 3. Use the program's imaginative library of "clip art" to assemble facial parts (eyes, ears, nose, mouth), a hairstyle, a torso, and assorted accessories such as eyeglasses and hats.

Watch the caricature come to life on screen as you type in simple, one-letter, mnemonic commands that make him or her wink, dance, cry, or give you the raspberry! Facemaker creations, which you can print on an Apple Scribe or ImageWriter, make great "refrigerator door" art.



Gertrude's Secrets

The Learning Company

System: 48K; color monitor required, joystick optional

Ages 4-7

\$39.95

Gertrude's Secrets helps children in kindergarten through fourth grade develop classification, organization, and sequencing skills. Use the joystick or keyboard to sort colored shapes in puzzles that Gertrude the Go-Getter Goose designs for you.

Puzzles become increasingly more challenging as your child advances his or her logical-thinking skills. Start with single-box puzzles, then try two-box puzzles with overlapping zones. Graduate to 3-by-3 and 4-by-4 array puzzles, then to train puzzles in which each piece differs from its predecessor in one or two characteristics.

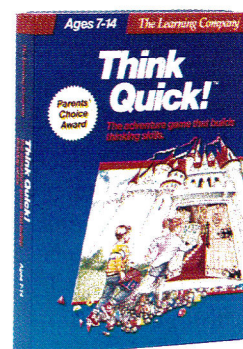
Think Quick!

The Learning Company

System: 64K; joystick or mouse optional, color monitor recommended

Ages 7-14

\$49.95



Company Addresses

Advanced Ideas

2902 San Pablo Ave.
Berkeley, CA 94702
(415) 526-9100

Reader Service No. 312

Baudville

5380 52nd Street S.E.
Grand Rapids, MI 49508
(616) 698-0888

Reader Service No. 313

Blue Lion Software

90 Sherman Street
Cambridge, MA 02140
(617) 876-2500
(800) 333-0199 (orders)

Reader Service No. 314

Britannica Software

345 Fourth Street

San Francisco, CA 94107

(800) 572-2272

(415) 546-1866

Reader Service No. 315

Broderbund Software

17 Paul Drive
San Rafael, CA 94903-2101
(415) 492-3500
(800) 527-6263

Claris Corporation

440 Clyde Avenue
Mountain View, CA 94043
(415) 960-1500

Reader Service No. 316

Davidson & Associates

3135 Kashiwa St.
Torrance, CA 90505
(213) 534-3169

Reader Service No. 317

DLM Teaching Resources

One DLM Park

Allen, TX 75002

(800) 527-4747

(800) 442-4711 (TX)

(214) 727-3346

Reader Service No. 318

Electronic Arts

2755 Campus Drive
San Mateo, CA 94403
(800) 571-7171
(415) 571-7171

Reader Service No. 319

Estes Industries

1295 H Street
Penrose, CO 81240
(719) 372-6565

Reader Service No. 320

Great Wave Software

5353 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-1990

Reader Service No. 321

The Learning Company

6493 Kaiser Drive
Fremont, CA 94555
(415) 792-2101

Reader Service No. 322

Marshware

P.O. Box 8082
Shawnee Mission, KS
66208
(816) 523-1059 (AK, MO)

Reader Service No. 323

MECC

3490 Lexington Avenue N.
St. Paul, MN 55126
(612) 481-3500

Reader Service No. 324

Mediagenic/Activision

3885 Bohannon Drive
Menlo Park, CA 94025
(415) 329-0800

Reader Service No. 325

Think Quick! is for graduates of the Gertrude's Secrets school of logical thinking. Find your way through the 100-room, six-level maze that constitutes Castle Mystikar. Search the castle for Magic Things hidden among Secret Passages.

Negotiate the castle's rooms with thought and care: Many "doorbells" are unbelievably remote; bouncing, wandering, wall-hugging Slime Worms can slow you down. (Quick brainpower earns more bonus points.) Cook up Magic Things to create the Enchanted Knight, the only one who can exorcise the castle of its evil dragon.

The New Game Show

Advanced Ideas

System: 64K; color monitor recommended

Ages 6 and up

\$39.95

Supplementary disks (require The New Game Show), \$19.95 each: **Science—Grades 3 & 4; Science—Grades 5 & 6; Language Arts—Grade 3; Language Arts—Grade 4; Language Arts—Grade 5; Language Arts—Grade 6; Social Studies—Grade 3; Social Studies—Grade 4; Social Studies—Grade 5; Social Studies—Grade 6; You & Your World**, ages 6–9; **Win with Words I**, ages 6–9; **Win with Words II**, ages 9–11; **People, Places, & Things**, ages 9 to adult; **Movies & Television**, ages 15 to adult; **Foreign-Language Words**, ages 11 to adult

The New Game Show takes off on television quiz shows on which contestants try to answer questions with the fewest hints possible. Your computer partners, Nora and David, coach you, get antsy if you seem to be dawdling, and cheer you when you come up with the right answer.

The main program disk comes with 40 databases of questions. A generous series of add-on disks lets you bone up on subjects ranging from science to social studies to foreign languages. You can even create your own homework-specific games.

Zoyon Patrol

MECC

System: 128K IIe, IIc, IIGS; color monitor recommended

Ages 12 and up

\$55 (5¼-inch format); home version \$29.95

\$59 (3½-inch format); home version \$34.95

Zoyon Patrol is an imaginative simulation that challenges you



MindPlay

100 Conifer Hill Drive
Building 3, Suite 301
Danvers, MA 01923
(800) 221-7911
(617) 774-1760

Reader Service No. 326

Mindscape

3444 Dundee Road
Northbrook, IL 60062
(800) 221-9884
(312) 480-7667

Reader Service No. 327

Optimum Resource

10 Station Place
Norfolk, CT 06058
(203) 542-5553

Reader Service No. 328

Pinpoint Publishing

5865 Doyle Street
Suite 112
Emeryville, CA 94608
(800) 633-2252
(415) 654-3050

Reader Service No. 329

Polarware

1055 Paramount Parkway
Suite A
Batavia, IL 60510
(800) 323-0884
(312) 232-1984

Reader Service No. 330

Pygraphics

P.O. Box 639
Grapevine, TX 76051
(800) 222-7536
(817) 481-7536

Reader Service No. 331

Right On Programs

755 New York Avenue

Suite 210
Huntington, NY 11743
(516) 424-7777

Reader Service No. 332

Scholastic Software

730 Broadway
New York, NY 10003
(212) 505-3561

Reader Service No. 333

Spinnaker Software

One Kendall Square
Cambridge, MA 02139
(800) 826-0706
(617) 494-1200

Reader Service No. 334

StyleWare

5250 Gulfton
Suite 2E
Houston, TX 77081
(800) 233-4088
(713) 668-1360

Reader Service No. 335

Sunburst Communications

39 Washington Avenue
Pleasantville, NY 10570
(800) 431-1934
(800) 247-6756 (Canada)
(914) 769-5030

Reader Service No. 336

Thunderware

21 Orinda Way
Orinda, CA 94563
(415) 254-6581

Reader Service No. 337

Tom Snyder Productions

123 Mount Auburn St.
Cambridge, MA 02138
(617) 876-4433

Reader Service No. 338

to save an endangered species of zoyons who have recently acquired a penchant for straying into Zaphyropolis city limits from their native habitats.

Your job is to solicit information about reported sightings by citizens, arrange to send out Science Teams if necessary (experts cost \$200), track the zoyons' movements (Zaphyropolis is made up of 16 boroughs), piece together clues about a particular zoyon's habits (does the zoyon favor backyard swimming pools?), determine what subspecies it is (a swamp dweller, maybe?), devise a way to trap the zoyon (trap prices range from \$100 to \$500), and arrange to return it to the wild—all within budget.

FINE ARTS—MUSIC AND GRAPHICS

Kids Time II: KidsNotes (with ABKey)

Great Wave Software

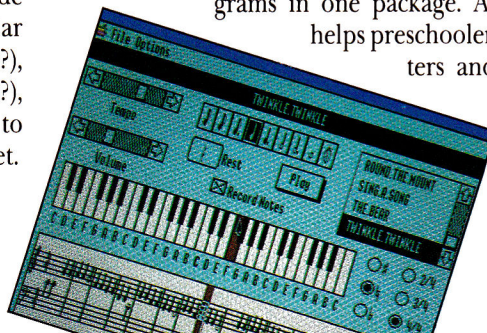
System: 512K IIGS

Ages 3-10

\$39.95

Kids Time II combines two entertaining, educational programs in one package. ABKey, a program that helps preschoolers learn to recognize letters and simple words, is described in the section

below under "Language Arts." The second program, KidsNotes, is an exceptionally ap-



Public-Domain Grab Bag

At an average of \$5 per disk of programs, why is public-domain software so inexpensive? It's simple: Most of the programs aren't of commercial quality. They often lack documentation, they sometimes fail to work as well as they might, and they're not wrapped in glitzy packaging.

Authors of *freeware* (another name for public-domain software) have literally donated their programs. *Shareware* programs, on the other hand, include software you essentially try before you buy. If you like a shareware program and continue to use it, you're asked to make a modest good-faith payment (usually \$20 or less) to the program's author. (His or her name, address, and request are provided on disk.)

Of course, someone has to organize, copy, and distribute freeware and shareware programs. That's where companies such as The Public Domain Exchange come into play. (For details on sources of public-domain software, see the accompanying Product Information box.)

Unlike the average user group (a club formed by like-minded Apple II users) where freeware is shared as much as camaraderie, The Public Domain Exchange is a commercial venture—something Judy Rosenthal, the company's president, says is necessary to provide the services the company offers, including free technical support. In addition, the company maintains one of the most extensive and well-indexed directories of Apple II freeware and shareware you'll find anywhere.

To help us celebrate the publication of this back-to-school issue of *inCider*, The Public Domain Exchange has prepared a special package containing six disks of selected educational software (#s 064, 087, 502, 504, 518, and 702), a free one-year membership (which makes you eligible for member discounts and brings you a quarterly magazine), and the 350-page directory—all for less than \$40. (See the product box for ordering information.)

The several dozen educational programs you receive in this Back-to-School package run the gamut from geography to speed reading, Hangman to genetics. Some programs are enhanced with colorful graphics and sound. All require a meager 48K and are *listable*; that is, you can break into the program, see its BASIC code, and make any changes you'd like—a great way to experiment with programming and an activity that's educational in itself! □

—C.F.

Product Information

Advantage Computing

24285 Sunnymead Blvd.
Suite #212
Moreno Valley, CA 92388
(800) 356-4666
(800) 346-9105 (CA)

Reader Service No. 306

B&L Consultants and Sales

P.O. Box 461
Wabash, IN 46992
(219) 563-7650

Reader Service No. 307

Big Red Computer Club

423 Norfolk Avenue
Norfolk, NE 68701
(402) 379-4680

Reader Service No. 308

Dynacomp

Dynacomp Office Bldg.

178 Phillips Road
Webster, NY 14580
(800) 828-6772
(716) 265-4040

Reader Service No. 309

Florida PC Library

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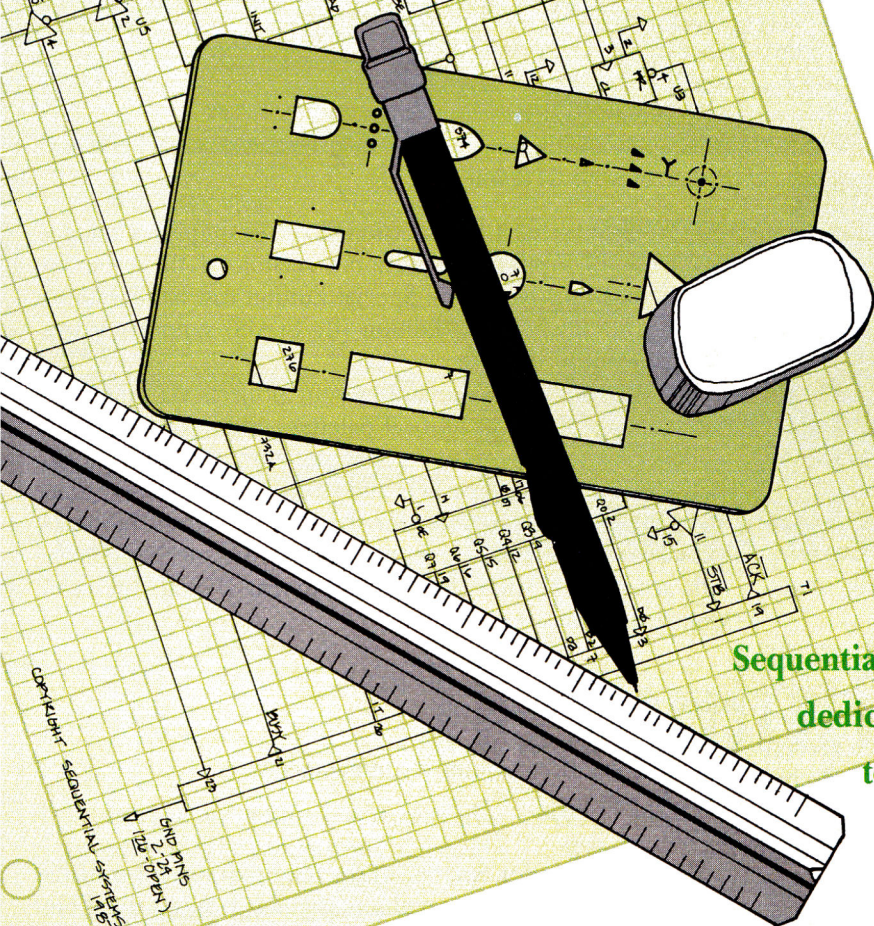
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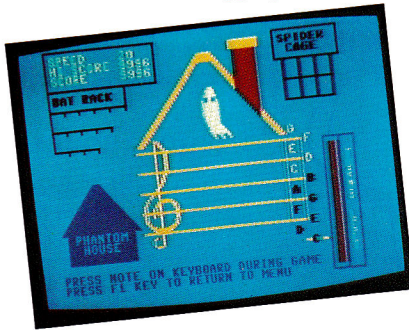
SEQUENTIAL SYSTEMS
computer products for education

pealing introductory music program.

KidsNotes' most attractive feature is its IIGs graphics interface. You can play the familiar songs stored in the program's built-in "jukebox," you can edit them, or you can compose single-voice originals. Use the mouse to play notes on the authentic-looking piano keyboard on screen, and watch the score develop below on the musical staff. Change notation, tempo, volume, or key by clicking on "radio buttons" or dragging "sliders."

The Notable Phantom

Britannica Software
System: 48K; color
monitor recommended
Ages 5-10
\$9.95

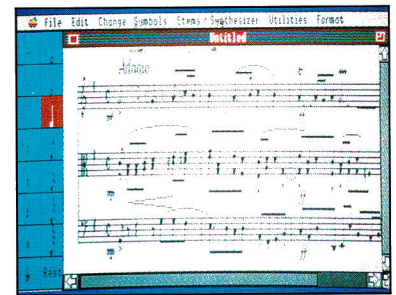


The Notable Phantom comes with *two* piano-like keyboards. One appears on screen; the second is a rigid plastic overlay that fits over the regular keys on the Apple II Plus, IIe, or IIC. Play the overlay as you would a real keyboard.

This interactive music-education program features creepy creatures such as spiders and ghosts who challenge you to play the note you see on the staff or play the note you hear. Organize a family sing-a-long and play the 20 popular children's songs contained in the accompanying songbook. Or stage a recital and play original compositions. No slouch in the award-winning department, The Notable Phantom is one of today's best values in Apple II software.

The Music Writer GS

Pygraphics
System: 768K IIGs;
printer required, MIDI
keyboard recommended
Ages 12 and up
\$119 (home version)
\$295 **Special Edition**
\$595 **Professional Edition**



The Music Writer GS professionalizes yet simplifies composition on the Apple II. The home version of the program accommodates three staves; Special Edition can handle up to six, and the Professional Edition (IIE or GS) supports scores with as many as 32 staves.

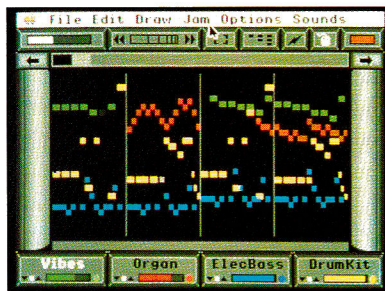
The Music Writer GS organizes your projects via nine pull-down menus and eight musical palettes—with symbols for articulation, dynamics, grouping, key, notation, and "special" effects such as rehearsal markers and lyrics. More expensive than other home-music programs for the GS, The Music Writer is geared to serious music students and hobbyists, including those with access to a MIDI (Musical-Instrument Digital Interface) keyboard synthesizer.

Music Construction Set

Electronic Arts
System: 256K IIGs; printer recommended
Ages 10 and up
\$49.95

Music Construction Set, one of the few programs for the IIGs that require only 256K, combines standard music notation, mouse input, and intuitive pull-down menus. Play works from the program's music library, or use the mouse to create your own music by placing notes one by one from the "note palette" onto the staff.

The program's 16 digitized instruments and the authentic sounds they generate on the GS range from a grand piano to a synthesizer to a "springomatic" (boing boing boing boing). Print your original compositions, write in lyrics by hand, and give Springsteen a run for his money.



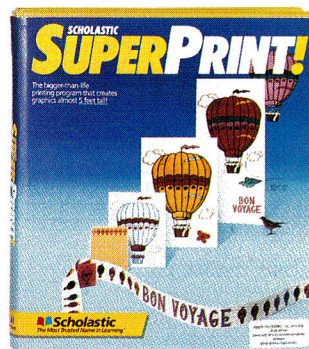
Instant Music

Electronic Arts
System: 512K IIGs
Ages 10 and up
\$49.95

Deluxe Music Libraries (require Instant Music), \$29.95 each:
Hot & Cool Jazz; It's Only Rock 'n' Roll

Instant Music is unique—it turns your mouse into a variety of musical instruments! Select any of the dozens of instruments in the main program's library or the Deluxe Music Library disks and jam on any one of the program's four tracks.

Instant Music's artificial intelligence sees to it that as you move the mouse, the most harmonious note plays with the music. A single keypress on the GS keypad changes rhythm and you can raise (or lower) the music a step at will. Use the mouse to plot music graphically—for *original* "instant" music.



SuperPrint

Scholastic Software
System: 128K IIE, IIC, IIGs;
second drive recommended,
printer required; 256K IIGs
(special GS version)
Ages 5 and up
\$59.95 school edition
\$49.95 home edition

Multiply memory — Add up to 1 MEG with Z-RAM Ultra.

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Multiply applications — Run CP/M programs with built-in Z-80B microprocessor.

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Multiplying your maximum number of records to 22,600 from the current 6,350. And available desktop memory rockets to over 700K with *all* of AppleWorks loaded into RAM.

You can do all of that and more with the Z-RAM Ultra expansion board for Apple IIC's.

Z-RAM Ultra completely loads programs into RAM, then runs them up to 30 times faster. And the included RAM disk is compatible with Applesoft, ProDOS, DOS 3.3, PASCAL and CP/M®.

Z-RAM Ultra even expands the clipboard and autosegments large files so they can be saved on two or more disks. Nothing else even comes close to enhancing Appleworks like this!

There's lots more.

Memory and speed just begin the story. Z-RAM Ultra 3 has a built-in Z-80B microprocessor so it can run CP/M programs. That's one of the largest bodies of software in existence and includes WordStar, dBase II, Turbo

PASCAL, Microsoft BASIC and more.

With Ultra 2 & 3, there's a ProDOS compatible, battery-backed up clock that displays time and date on AppleWorks screens *and* time and date stamps any ProDOS file.

There's an AppleWorks printer buffer so you keep working while files are printed.

With its patented technology and computer aided design, Z-RAM Ultra runs with less than half the power drain of other memory cards.

Easy to install.

It's easy to get all that performance. Z-RAM Ultra installs in just a few minutes with a screwdriver — no jumper wires, no clips, no drive removal.

A complete package.

Z-RAM Ultra comes with simple, easy-to-follow instructions, RAM disk software, Z-80 operating system, CP/M manual, a five-year parts and labor warranty, and all the AppleWorks enhancements we're famous for.

See your dealer or call today.

For more information or to order your Z-RAM Ultra, see your dealer or call 214-241-6060 between 9 am and

11 pm, 7 days. Or send check or money order to Applied Engineering.

Prices

Z-RAM Ultra 3 (with memory, clock and CP/M)
256K — **\$389** 512K — **\$519**
1 MEG — **\$779**

Z-RAM Ultra 2 (with memory and clock)
256K — **\$309** 512K — **\$439**
1 MEG — **\$699**

Z-RAM Ultra 1 (memory only — expandable to 512K)
256K — **\$239** 512K — **\$369**

16-bit 65C816 Upgrade **\$79**

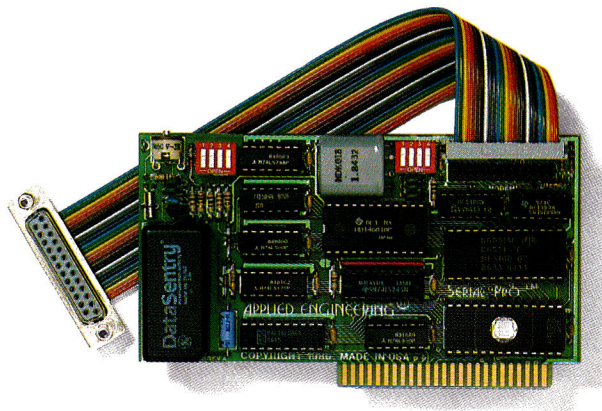
Z-80c Card to run CP/M software (no memory upgrade) **\$159**

MasterCard, VISA and C.O.D. welcome. Texas residents add 7% sales tax. Add \$10.00 outside U.S.A.

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Serial Pro® The intelligent multifunction card from Applied Engineering.



Serial Pro is a powerful multifunction card for the Apple IIe, II+, IIGs and compatible computers. Serial Pro combines a powerful serial port for interfacing to a printer, modem or other serial device, with a full function clock/calendar. Serial Pro's serial port is compatible with virtually all letter quality and dot matrix printers, including Apple's Imagewriter and Imagewriter II, and can communicate with the fastest external modems at baud rates from 50 to 19,200.

Set up is easy, because unlike other cards, there are no switches to program serial parameters or disks to use. Serial Pro has a built-in setup screen that allows all parameters to be set. And on-screen help that makes it super-easy. An on-board battery stores your selections for over 20 years, but you can change them at any time. Serial Pro is the perfect upgrade for Super Serial card owners looking for more performance or a built-in clock.

Serial Port Features

- Fully Super Serial Card compatible but more versatile and easier to use
- Compatible with printers
- Compatible with modems
- Prints graphics to printer (without software) in normal mode, 90° rotation, double size, side by side, and black/white inversion
- Variable word length, number of stop bits and parity selection
- Crystal controlled circuits are used to provide ultra accurate baud rates.

Clock Calendar Features

- ProDos, DOS and AppleWorks compatible. Displays time and date on the AppleWorks screen
- Automatically time and date stamps AppleWorks files
- 20 year auto recharging nickel-cadmium battery
- Realtime interrupts
- Built-in on screen time and date settings (no software needed)
- Does not use phantom slots.

Serial Pro is perfect for Apple IIe, II+, IIGs or compatible owners in need of a serial port or clock/calendar or both. But unlike other multifunction cards on the market, Serial Pro does not use phantom slots, so all the slots in your computer are useable.

Serial Pro comes complete with manual, cable and instructions for connecting to all the leading printers and modems.

Serial Pro **\$139**

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The Apple enhancement experts

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SuperPrint Library Disks (require SuperPrint), \$24.95 each: **Graphics Pack I** (Science and Social Studies); **Graphics Pack II** (People, History, Animals); **Graphics Pack III** (Holidays and Sports); **Graphics Pack IV** (Special Events)

SuperPrint is surely well named. One of the newest products for childhood desktop publishing, SuperPrint and its add-on Graphics Packs provide a super collection of ready-made clip art and text fonts for creating stationery, signs, greeting cards, placemats, decorations, wall calendars—even a full-size, Pin-the-Tail-on-the-Donkey game!

SuperPrint's visual interface is super easy to learn, too. Unlike most programs of its kind, SuperPrint lets you create documents in as many as seven different sizes—even super-size, 55-inch-high posters. SuperPrint is an enticing way to help children become confident using a computer. Even nonreaders will like this program, though they'll need parental assistance to use some features.

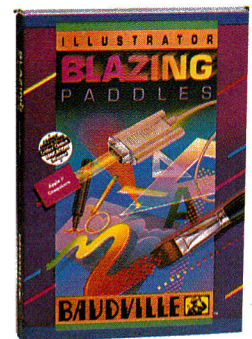
Blazing Paddles

Baudville

System: 48K; color monitor and printer recommended; joystick, mouse, or compatible input device required

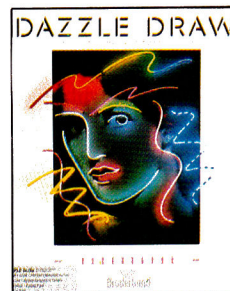
Ages 4 and up

\$34.95



Blazing Paddles is perhaps the least demanding and least expensive of Apple II paint programs—but that doesn't mean it's the least capable. In fact, we think Blazing Paddles is the best paint program for the Apple II Plus and the 64K Apple IIe.

Sketch freehand or use the program's built-in objects, including rectangles, circles, and ovals, to create appealing high-resolution drawings. Enhance your work with pure and dithered colors from the program's paint palette. Add finishing touches with the flood-fill, airbrush, or text tool. Print your masterpiece in black-and-white on a wide variety of dot-matrix printers or in color on the Apple Scribe, ImageWriter II, or Okimate 20.



Dazzle Draw

Broderbund Software

System: 128K IIe, IIc, IIGs; joystick, mouse, KoalaPad, or Apple Graphics Tablet required; printer recommended

Ages 8 and up

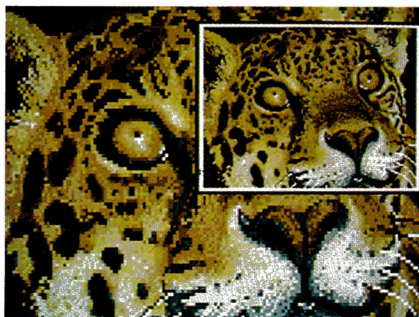
\$59.95

Compatible products: **Pinpoint Desktop Accessories**, Pinpoint Publishing, \$89; **AppleWorks**, Claris Corporation, \$249; **Picture Manager**, StyleWare, \$39.95; **MultiScribe**, StyleWare, \$79.95

Dazzle Draw ranks first among double-high-resolution paint-

One special feature built into Dazzle Draw lets you put together self-running slide shows to send to your friends. You can incorporate Dazzle Draw creations into your school reports, too, if you have Pinpoint's GraphMerge Desktop Accessory and AppleWorks, or StyleWare's Picture Manager and MultiScribe.

Other recommended products: **Calendar Crafter**, MECC, \$59; **MultiScribe GS**, StyleWare, \$99.95; **ThunderScan** (requires an ImageWriter printer), Thunderware, \$219



With Paintworks Gold the creative possibilities are limitless, thanks in part to compatibility with other GS software—such as Calendar Crafter from MECC and MultiScribe GS from StyleWare—and Apple II hardware such as ThunderScan, the flat-art digitizing scanner from Thunderware. Paintworks Gold enhancements such as Postcards GS could help make art your favorite school subject.

\$69.95

A detailed view of the Parallel Pro card, showing its green PCB populated with several integrated circuits, including a central controller chip labeled "PARALLEL ENGINEERING". The card features a multi-pin connector at the bottom and a ribbon cable interface on the side.

-

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*To be very specific, you need an Apple IIc, Apple IIGS or Apple IIe enhanced with 128K of ROM, an 80 column card and a Super Serial card. **General Services is provided to you by Quantum Computer



be able to tap into a much richer source of what's new and now: Apple users just like yourself from all over the country. You can chat live on-line with other users, share tips, get insights into program quirks, find out about how other people have solved the problems you're facing now. And soon, you'll be joined on-line by thousands of Macintosh® personal computer users. Which will be even more fun and informative.

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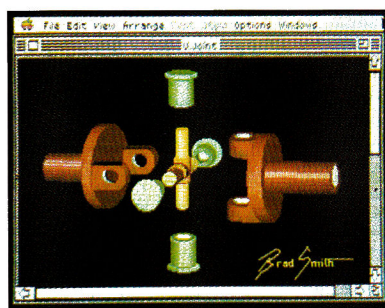
Animate turns your 128K Apple II into a home-based movie-production studio. The accompanying guide, *The Art of Animation*, teaches the basics of creating double-high-resolution cartoons through cell animation, the kind of animation “flip books” display.

Use the program’s built-in library of backgrounds and character images—or import artwork you’ve created with Dazzle Draw (another of our “Top 40” programs). Animate lets you have as many as 16 characters in each scene. You can even add simple music to your movies—Animate has a piano-like keyboard you play with the mouse!

TopDraw

StyleWare

System: 512K IIGs;
printer recommended
Ages 12 and up
\$89.95



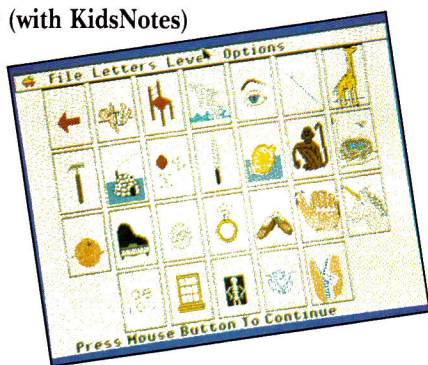
TopDraw really is “top drawer.” This #1 GS drawing program features object-oriented graphics—unlike the often difficult-to-edit, bit-mapped graphics that characterize paint programs. With TopDraw you can design any two-dimensional drawing precisely—whether it’s a machine part or a floor plan—with either English or metric-system ruler guides.

Use the program’s paint palette (with 4096 possible colors) and built-in objects (including line, rectangle, oval, and polygon) to design your basic scheme. Fine-tune your drawing by smoothing polygons and mirroring, flipping, or shuffling objects—and adding text. Print your designs on an ImageWriter II and incorporate them into reports for science or shop class.

LANGUAGE ARTS—EXPRESSING YOURSELF

Kids Time II: ABKey (with KidsNotes)

Great Wave Software
System: 512K IIGs
Ages 3–10
\$39.95



Kids Time II’s letter- and word-recognition program, ABKey (the Kids Time II music program, KidsNotes, is reviewed in the “Fine Arts” section of this article), exploits the GS’ superior graphics and music capabilities. Use the program’s Letters, Level, and Options pull-down menus to select the kind of super-high-resolution challenge presented: uppercase letters, lowercase let-

ters, easy pictures (“apple” to “zebra”), or hard pictures (“arrow” to “zipper”).

Begin with “1 at a Time” and “Slow” speed. See the “L” graphic? Press the “L” key. A picture of an umbrella? Press the “U” key. Each correct answer is rewarded with a musical phrase. The most challenging level requires you to identify a letter or picture—before the next graphic pops up on screen.

Learning to Write with Ed Emberly:

Uppercase Letters

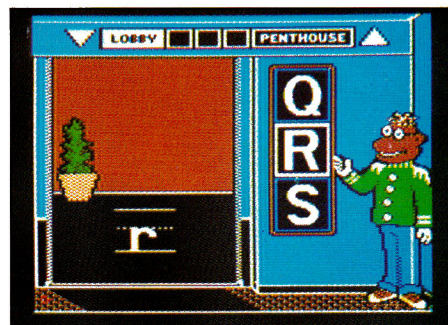
Lowercase Letters

Right On Programs

System: 48K
Ages 4–6
\$35 each
\$60 both

Learning to Write with Ed Emberly teaches children correct printed-letter formation through colorful, musical, animated graphics. Designed by Ed Emberly, the Caldecott Award-winning children’s author and illustrator, Learning to Write features colorful scenes for each letter of the alphabet: bears playing banjos (B), kangaroos kissing (K), and pigs on pogo sticks (P).

Watch the cursor draw the letter on screen. Pressing the correct letter on the keyboard animates the scene; pressing the correct key again stops the action. Children can use the activity sheets accompanying the program to practice their letters. Need more help with the letter H? Ask Ed Emberly’s harmonica-playing horses!



Muppet Word Book

Sunburst Communications

System: 64K; supports keyboard, Apple Mouse, or Muppet Learning Keys
Ages 4–6
\$65

Other recommended products: **Muppet Learning Keys**, Sunburst Communications, \$99 (comes with **Muppets on Stage** educational software)

Muppet Word Book features “you know who” in six learning games designed to help preschoolers distinguish letters from symbols, to recognize upper- and lowercase letters, and to form complete words by adding appropriate beginning consonants and endings.

Sound pedestrian? Not with Scooter the elevator operator, Gonzo the human cannonball, and Miss Piggy the astronaut! Muppet Word Book even has a baby word processor that looks like a child's slate.

Muppet Word Book supports the Muppet Learning Keys input device. Unlike an ordinary keyboard with its QWERTY layout, this children's keyboard has keys arranged in alphabetical order. Muppet Learning Keys is easily cleaned, sturdy, and works with more than a dozen Sunburst products.

Cotton Tales

MindPlay

System: 48K; color monitor and printer recommended

Ages 4-8

\$49.99

Cotton Tale Libraries (require Cotton Tales), \$29.99 each: **Cotton Plus** (160 additional graphics); **Cotton Works** (50 prepared worksheets)

Cotton Tales helps preschoolers and early elementary-school students express themselves creatively through words and pictures. A Typing option makes Cotton Tales a lot like a grownup word processor—kids can type in words at the hopping-bunny cursor. Use the arrow keys to move Cotton the bunny and type some more or . . .

Oops! At a loss for words? Glance through the program's Picture Dictionary and select an appropriate graphic from categories such as Holidays or Animals. Mixing words and pictures helps kids create letters, stories, poems, and rebuses. Like all MindPlay products, Cotton Tales includes Challenge Upgrade, a customizing feature; and with Cotton Plus and Cotton Works, two add-on products, you can expand the Picture Dictionary and printed worksheets for additional word play.

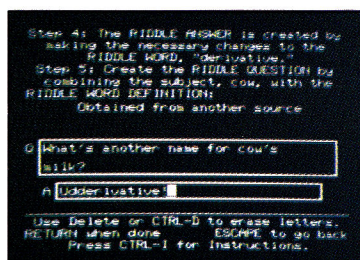
Riddle Magic

Mindscape

System: 48K; printer recommended

Ages 8 and up

\$49.95

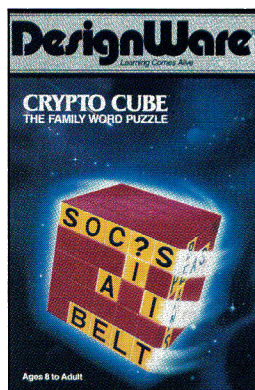


Other recommended products: **The Print Shop**, Broderbund Software, \$49.95

Riddle Magic sets you up for hours of creative enjoyment. Designed by "America's Riddle King," Mike Thaler, this new program teaches you how to create four different kinds of riddles—No-Letter Drop, Single-Letter Drop, Double-Letter Drop, and Sound Substitute—using only your imagination and the program's built-in database of 1800 riddle words and 30 picture starters.

A Riddle Writer feature lets riddle "graduates" import graphics compatible with the non-GS version of Broderbund Soft-

ware's Print Shop. With Riddle Writer, you can create your own riddles without program assistance. Save riddles on disk and play them later on. Or print riddle books for your friends and classmates. You can even rewrite history: "What famous pig discovered relativity?" (Albert Einswine.)



CryptoCube

Britannica Software

System: 48K; joystick or mouse optional

Ages 8 and up

\$9.95

CryptoCube is one word game the whole family can enjoy for years—and at a one-time price you just can't beat this side of the public domain! The program comes with a 1000-word "vocabulary," but you can add as many of your own sets of words as you like: spelling words, science terms, inventor's names, foreign words (no accents supported), world landmarks, car parts—you name it!

CryptoCube generates hidden-word puzzles on a four-sided rotating grid. Pick a square; vowels appear automatically when you select their squares, but consonants require some educated guessing. Work alone or compete with another player until all the words are revealed.

Crossword Magic

Mindscape

System: 48K; printer recommended

Ages 7 and up

\$59.95

\$99.95 (Crossword Magic and all six Puzzle Disks)

Crossword Magic Puzzle Disks (require Crossword Magic), \$14.95 each: **Mathematics**; **Science**; **Social Studies**; **Language Arts**; **Reading**; **Spelling**

Crossword Magic may well be the "veteran" among our "Top 40." It's little wonder this program has stood the test of time. You can play puzzles on disk (six supplementary disks with ready-made puzzles for various curriculum areas are available), but, best of all, Crossword Magic takes the work out of designing your own puzzles.

Start with a custom or automatic grid size, then type in the words you want to appear. Young children might type in the names of familiar household objects; older kids might use biology-homework words. The program fits all the words it can automatically. As the program prompts you, type in a clue for each word. Print your puzzle (with or without an answer key), decorate it with original artwork (how about crossword-puzzle holiday greeting cards?), and share with family and friends.

The Writing Adventure DLM

System: 48K; color monitor recommended
Ages 9 and up
\$59.95

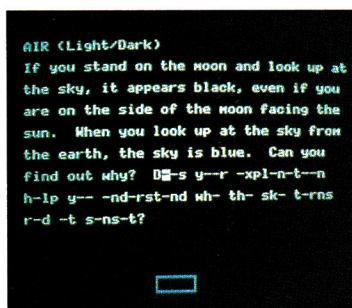


The Writing Adventure is an interactive story you invent as you go along. The initial scene is a secret cave depicted on screen. As your hero explores its recesses and chambers, the program interjects leading questions to help you further your story line. Use the program's note-taking feature to keep track of scene descriptions and developmental details. The Writing Adventure saves your notes on disk.

When you finish each adventure, write your story and edit it with the help of Proofing Aid, a grammar checker that assists you in finding common errors. Print your story and share it with friends and teachers. The Writing Adventure offers a budding author so many possible choices that he or she can create an entire adventure series to rival Harlequin romances!

M-SS-NG L-NKS:

**Young People's Literature
MicroEncyclopedia Classics,
Old and New Science Disk**
Sunburst Communications
System: 48K
Ages 8 and up
\$65 each



M-SS-NG L-NKS generates *Wheel of Fortune*-like puzzles based on literary or science passages in which designated patterns of letters have been omitted. Nine different formats are available, including one in which all consonants are left out and another in which all but the first letter of each word are missing.

Children work their way through each passage and use their knowledge of spelling, word sense, and style to fill in the blanks. Your score is based on the number of guesses you need and the number of hints the program supplies. M-SS-NG L-NKS is an entertaining way to develop word intuition while reading quality literature or studying scientific phenomena.

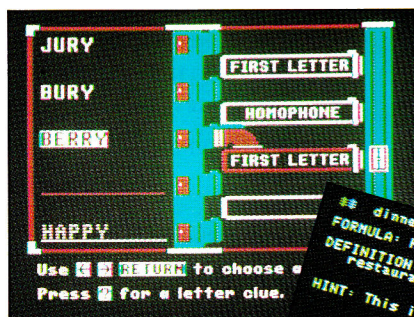
Word-a-Mation

Sunburst Communications
System: 64K
Ages 9 and up
\$65

Word-a-Mation is a demanding word game that will challenge even the best student. The program's graphics "word-a-mat" generates the first and last words in a chain; depending on the level of difficulty you select, the relationships among the words seem more

and more remote, until you begin to churn out possible linking words with the program's six special machines: antonym, category, homophone, spelling, synonym, and verb tense.

A word chain that begins with *rich* might have links such as *poor* (antonym), *pour* (homophone), and *four* (homophone), and end with *number* (category). Don't worry: Word-a-Mation provides letter clues to "grease" rusty word-a-mat machines and help you figure out linking words.



Hinky Pinky

Mindscape
System: 48K
Ages 10-18
\$49.95



Hinky Pinky is a name game and riddle-making rib-tickler. Try to decipher the ready-made, rhyming word pairs that come on the program disk by answering riddles about "a beautiful pet" (a pretty kitty) or a "wealthy woman who practices black magic" (a rich witch).

Technically, "rich witch" is a *hink pink*. More syllables bring greater challenge. (The program provides hints if you need them—and you will.) A *hinkety pinkety* is a rhyming pair of three-syllable words, for instance. Hinky Pinky comes with a 6400-word rhyming list to help you and your already astuter computer stump chumps with some razzle-dazzle wordsmithing.

MATH—MONKEYS BLAST OFF

Math and Me

Davidson & Associates
System: 128K; IIE 80-column card required; supports the mouse, color monitor recommended; available in 5¼-inch or 3½-inch format
Ages 3-6
\$39.95

Math and Me Workbooks, \$3.95 each: Preschool, Book 1; Preschool, Book 2; Kindergarten, Book 1; Kindergarten, Book 2; First Grade, Book 1; First Grade, Book 2

Math and Me lets even the youngest members of your family monkey around independently in these 12 premath and simple-addition learning games—thanks to the program's Early Learner Interface and its captivating monkey characters. Use the mouse

or the keyboard to explore activities that teach shapes, patterns, numbers, and beginning addition.

Games offer double-high-resolution graphics and sound. To learn number sequencing, for example, a number line in the form of a xylophone not only helps kids see the sequence but hear it, too. A series of special Math and Me workbooks is available to supplement and underscore what your child has learned at the computer.



Math Blaster Plus

Davidson & Associates

System: 128K; Ile 80-column card required; mouse supported; available in 5¼-inch or 3½-inch format

Ages 6–12

\$49.95 (\$10 for backup disk)

Math Blaster Workbooks, \$4.95 each: Grade 1 Addition; Grade 1 Subtraction; Grade 1 Addition & Subtraction; Grade 2 Addition; Grade 2 Subtraction; Grade 2 Addition & Subtraction; Grade 3 Multiplication; Grade 3 Division; Grade 3 Multiplication & Division; Grade 4 Multiplication; Grade 4 Division; Grade 4 Multiplication & Division

Math Blaster Plus helps children master some 750 math facts (addition, subtraction, multiplication, division, fractions, decimals, and percentages) at any of six levels of difficulty through five entertaining and challenging games: Countdown, Ignition, Lift-off, Orbit, and the Blasternaut Game.

Use the mouse or the keyboard to select these activities from the program's graphics main-menu screen. It may present problems in horizontal, vertical, or mixed format. Stellar performers review their score at the end of each exercise and get to play the Blasternaut Game, an arcade-style activity that requires mastery of math facts. Supplemental workbooks for subtraction and addition are available for children in first through fourth grades.

Fish Scales

DLM

System: 48K; color monitor recommended

Ages 5–9

\$32.95

Fish Scales is an unusual program—it gives children a head start in mastering the concepts of measurement and dimension.

Cast off for learning fun on these imaginary fishing trips, complete with realistic-looking fish and seafaring music such as the *Sailor's Hornpipe*.

A friendly fisherman prompts the child and reacts to his or her responses in Fish Scales' six games: Fish Jump, Today's Catch, Look and Hook, Which Fish, Fishing Dock, and Fishing Derby. The program defines no measurement units; for instance, the child responds that the fish is "4" long without concern for inches, feet, or centimeters.

Bake & Taste

MindPlay

System: 48K

Ages 6–14

\$49.99

Bake & Taste mixes simulation with reality. Select one of the computer's dessert recipes to prepare for the imaginary guests who plan to drop in. You'll need to gather the ingredients from the appropriate locations—graphics of a cupboard and a refrigerator, for example, are shown on screen. For each ingredient choose the correct measuring device and amount; bake at the correct time and temperature according to instructions.

Your imaginary guests are a finicky lot—they actually perform a critical taste test of your final product! When you've finished practicing a recipe in the computer simulation, you can print it, then make these yummy desserts in your own kitchen. And do your own taste test!

Robomath

MindPlay

System: 48K

Ages 7 and up

\$49.99

Robomath is a paddle-and-ball, arcade-style game that's also educational *and* environmentally sound! Help Roboman clean up the garbage those dirty little Trashbots have left all over your town. Strewn among the debris are Quiz Boxes with multiplication or division problems. (Challenge Upgrade lets parents control the difficulty level of these problems.)

The ultimate solution to the litter problem lies in closing down the Trashbot assembly plants at the top of the screen. Hit a ball through a factory door and bankrupt each offending polluter.

Math Shop

Scholastic Software

System: 64K

Ages 10–15

\$29.95



Math Shop helps teenagers master practical math skills by simulating jobs at a shopping mall. Working in the make-believe Pharmacy, you sharpen your understanding of percentages. In Alice's Palace of Donuts, you fill customers' orders by mastering fractions and ratios: There's always one customer who'll ask for a dozen donuts and want a third of them glazed!

You'll have to be quick whether you're helping out at the Grocery or the Jeweler's, because customers keep pouring in. Work your way through all ten mall stores and become a "top employee" in each!

SCIENCE—THE WORLD AROUND US



AI

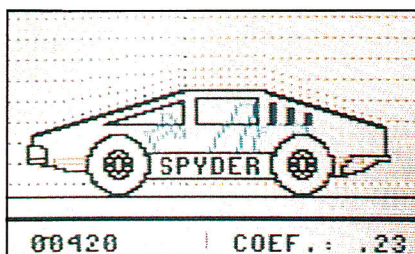
Scholastic Software
System: 128K; color monitor
Ages 5 and up
\$49.95

AI is the kind of program George Orwell must have had in mind when he wrote *Nineteen Eighty-Four*. Fortunately, with AI you're in control—or are you? This extraordinary strategy game pits you against your Apple as you place game pieces in selected patterns on a 3-by-3 to 6-by-6 grid. Play games with the computer and win hands down.

But remember: Big Brother is watching! AI (which, after all, stands for *artificial intelligence*) analyzes moves, goals, and winning game boards. The program's Brain Scan feature shows you how AI plans to beat you—literally at your own game.

Car Builder

Optimum Resource
System: 48K; 64K for 3½-inch disk
Ages 8–adult
\$39.95



Car Builder lets would-be automotive engineers design their own dream cars—without getting any grease under their fingernails. This educational CAD (computer-aided design) program provides a wealth of car parts. Pick and choose to design a chassis, consider appropriate engine components, and build the suspension system. Don't forget (screech!) brakes.

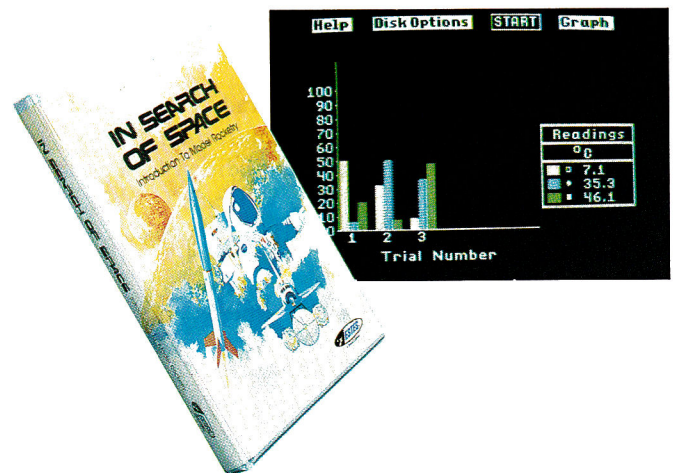
Test your design for its aerodynamic qualities in the program's wind tunnel. Too much drag and you won't be able to pass trucks safely on a freeway. Run your superauto on Car Builder's test track to assess the vehicle's racing potential.

Playing with Science: Temperature

Sunburst Communications
System: 64K
Ages 5–12
\$99 (includes three temperature probes and interface cable)

Playing with Science: Temperature equips you with the hardware components and software capabilities you need to run temperature experiments at home. The program comes with three temperature probes, so you can perform experiments that compare the temperatures of different objects. Probes are connected to an interface that plugs into the game port on the back of most Apple IIs. The manual explains how to make your own backup interface box and probes from readily available electronics supplies.

Playing with Science: Temperature contains 33 activities at increasingly demanding levels to get you started. The program not only keeps track of each experiment's progress, but lets you print data and graph them, as well—a perfect (and necessary) addition to your next science-fair project notebook or poster.



In Search of Space: Introduction to Model Rocketry

Estes Industries
System: 64K
Ages: 10 and up
\$24.95

In Search of Space is a colorful high-resolution graphics tutorial introducing children to a popular hobby that will kindle an interest in physical science: model rocketry. This animated program, created with another of our "Top 40" products, Blazing Paddles (see the "Fine Arts" section), teaches rocketry basics: names of rocket parts, types of engines, and igniter installation.

Tech Tip, the company's nerdy spaceguy spokesman, teaches

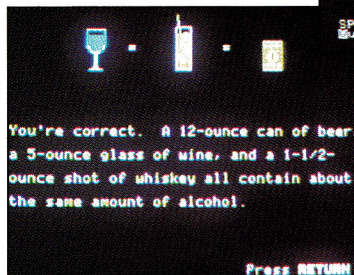
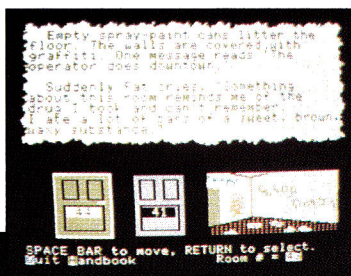
model-rocket safety. In Search of Space is an inexpensive way (a beginner's model-rocket kit costs about \$20) to make science come alive for kids, and to blend a child's love for computers with his or her need to expend physical energy in the great outdoors.

Drug Alert!

Mindscape
System: 48K
Ages 10 and up
\$39.95

Drug Alert! gives kids a lot of reasons to say no. In this simulation, you must rescue your friend Pat from the bowels of a run-down hotel. Collecting cryptic clues about Pat's addiction along the way, you have to make your way up four floors. Preventing you from succeeding are junkies and other sickos who block your way until you can answer questions about various commonly abused substances.

Even the elevator operator tries to hamper you in your search for drugs stashed on each floor. Find them and destroy them in an incinerator—you'll make a lot of hotel "residents" groan, but eventually you and Pat will make it out, *if* you can identify the drug that got Pat into trouble in the first place. Drug Alert! comes with an information-packed drug database handbook on disk. If you rescue Pat, you get the password that lets you print the handbook for future reference.



Alcohol: The Party
Marshware
System: 48K
Ages 11 and up
\$52.45

Alcohol: The Party invites your kids to participate in an imaginary party at which both nonalcoholic and alcoholic beverages are served. Decide what to drink (beer, wine, hard liquor), how often, and with or without food. As the party progresses, the computer displays your blood alcohol level and your mood as your choices affect it.

Play the arcade-game simulation to see how your blood alcohol level alters your perceptions. The computer skews the game so that if you're "playing under the influence," there's no way you'll shoot down the aliens. The simulation continues until you get home (*if* you do) and wake up the next morning (with or without a hangover). Without preaching, Alcohol: The Party lets kids know the real consequences of overindulging.

SOCIAL STUDIES—PAST, PRESENT, AND FUTURE

The Oregon Trail

MECC
System: 64K
Ages 11 and up
\$55 (5¼-inch format), \$59 (3½-inch format)

The Oregon Trail makes geography and history come alive through interactive graphics adventure. The year is 1848. Your goal is to survive the danger-ridden, 2000-mile trek along the Oregon Trail.

Along the way you can ask people for advice, which you're free to ignore or to follow. When food supplies dwindle, you'll have to hunt—did you bring enough bullets? Sickness and setbacks are sure to slow you down, but if you're prepared, you'll make it.

The Other Side

Tom Snyder
Productions
System: 48K;
modem optional
Ages 12 and up
\$69.95



The Other Side pits two teams in a struggle against their own self-interest to build a bridge linking their two make-believe nations. To support its peace-making efforts, each nation must exploit natural resources at home and in the neighboring country.

Teams can play cooperatively or competitively with concomitant levels of aggression. Each nation has a Computer-Assisted Defense System that sometimes has its own ideas of "cooperation," and starts invasions or sets off bombs when you least expect it. Two remote teams can play via modem, a realistic and unusually appealing feature of The Other Side.

IT'S A WRAP

While certain programs described in this article—such as the "talking" version of Reader Rabbit for the IIGS, discussed in the sidebar "The Elite Eight" (pp. 64–65)—are relatively new, many are time-honored award winners. More than a handful have been endorsed by the National Education Association, and many have collected awards from *Parents' Choice* and other publications devoted to childhood learning.

If you've already mortgaged the homestead for new jeans jackets, don't despair. You'll find some real bargains among public-domain educational programs. See the accompanying sidebar "Public-Domain Grab Bag" (p. 50) for more information on building a library of low-cost educational software. Have a happy and successful school year! ■

Cynthia Field is the author of Field Trip, inCider's column on educational software, and Press Room, our bimonthly column on desktop publishing. Write to her at 60 Border Drive, Wakefield, RI 02879. Enclose a self-addressed, stamped envelope if you'd like a personal reply.

The Elite Eight

At least a half-dozen companies seem to follow one home-education success story with another . . . and another . . . and another. Before you know it, publishers such as Optimum Resource, Polarware, and The Learning Company offer a whole string of products featuring bears, spies, or rabbits! Listed below are our favorite series of home-education programs. We think they'll become your favorites, too.

Electric Crayon, \$14.95 each:

ABC's

Fun on the Farm

This Land Is Your Land

Electric Crayon Deluxe, \$29.95 each:

Dinosaurs Are Forever

Holidays and Seasons

Polarware

System: 128K; mouse recommended

Ages 3-6

Electric Crayon is a series of educational computer coloring books that focus on early-learning themes: ABC's (the alphabet), Fun on the Farm (animals), and This Land Is Your Land (geography). Use the program's colorful paint palette to select a pure or a mixed color. Move the "crayon" cursor to the area of your scene you want to color—and click! You can print any picture (in color on an ImageWriter II) with a calendar for any month you choose.

Electric Crayon Deluxe adds two new, enhanced products to this line of computer coloring books: Dinosaurs Are Forever and Holidays and Seasons. These products put banners and posters on your list of desktop-publishing possibilities. The package includes a set of colorful stickers, so you can custom decorate your Electric Crayon Deluxe calendars!

Sesame Street Crayon, \$14.95 each:

Numbers Count

Letters for You

Opposites Attract

Polarware

System: 128K; mouse recommended

Ages 3-6

Sesame Street Crayon is a series of computer coloring books similar to Electric Crayon (described above). Kids can use the computer paint palette and crayon cursor to color and recolor the more than two dozen pictures that come on each of the series' three disks: Numbers Count, Letters for You, and Opposites Attract.

This series features your child's Sesame Street friends, including Big Bird and Bert and Ernie. Sesame Street Crayon programs print monthly calendars, too.

The Stickybear Series, \$39.95 each:

Stickybear ABC, ages 3-6

Stickybear Numbers, ages 3-6

Stickybear Shapes, ages 3-6

Stickybear Opposites, ages 3-6

Stickybear Reading, ages 5-8



Stickybear Typing, ages 6 and up

Stickybear Spellgrabber, ages 6-9

Stickybear Math 1, ages 6-9

Stickybear Town Builder, ages 6-9

Stickybear Printer, ages 7 and up

Stickybear Printer Picture Library 1

Stickybear Math 2, ages 7 and up

Stickybear Drawing, ages 7 and up

Stickybear Reading Comprehension, ages 7-9

Stickybear Music, ages 8 and up

Stickybear Music Library 1

Stickybear Parts of Speech, ages 8-12

Stickybear BASIC, ages 9 and up

Optimum Resource

System: 48K; 64K for 3½-inch disk; color monitor recommended

The Stickybear series includes the broadest educational choices we've seen. This friendly, talented family of bears teaches everything from letter recognition (Stickybear ABC) to music composition (Stickybear Music) to computer programming (Stickybear BASIC). (We're almost waiting for some reading adventures called Stickybear Dundee!)

These programs share an easy-to-use interface, so most children can work independently. Stickybear software is colorful and animated; it's no surprise that kids like the Stickybear family and their programs. Parents will, too.

The Munchers, \$55 each, 5¼-inch format, \$29.95 home version; \$59 each, 3½-inch format, \$34.95 home version:

Word Munchers, ages 6-adult

Number Munchers, ages 8 and up

Fraction Munchers, ages 8 and up

MECC

System: 64K; 128K for Fraction Munchers; color monitor recommended

Ages 6 and up

The Muncher series from MECC combines the best of arcade-style gaming with practice in basic skills. The three programs in the series, Word Munchers, Number Munchers, and Fraction Munchers, teach math facts, phonics, and fractions in a PacMan-like setting.



While you maneuver your Muncher around a grid made up of boxes with numbers, words, or equations that match a "target," Muncher-ivorous Troggles follow in pursuit. If you're fast, you can find all the matches and avoid the predators. Each game is progressively more difficult, but that doesn't stop you: The Muncher series is not only educational, it's totally addicting.

The Spy's Adventures, \$17.95 each:

The Spy's Adventures in Europe

The Spy's Adventures in North America

The Spy's Adventures in South America

The Spy's Adventures in Asia

The Spy's Adventures in Africa, available in 1989

The Spy's Adventures in Australia & Pacific Islands, available in 1989

Polarware

System: 64K

Ages 8 and up

The Spy's Adventures series teaches geography and history in a wholly refreshing way. Your job in these interactive detective stories is to flit around Europe or the other continents in search of an international felon, Dr. X.

Travel logically (study the map included), collect jewels, and find informers from whom you buy information. You'll learn about famous landmarks and historical sites as well as foreign currency. Collect information to help you decipher the ultimate word clue to Dr. X's whereabouts. The Spy's Adventures are graphically superb. These games are challenging whether you play alone or with another spy catcher—cooperatively or competitively.

The Carmen Sandiego Series:

Where in the World Is Carmen Sandiego?, \$39.95

Where in the USA Is Carmen Sandiego?, \$44.95

Where in Europe Is Carmen Sandiego?, \$44.95

Broderbund Software

System: 64K; 128K Europe

Ages 8 and up

The Carmen Sandiego series focuses on your worldwide

search for a whole gang of felonious miscreants, including their leader—Carmen herself. (The program manual includes a complete dossier on Carmen's gang.) These criminals like to steal national treasures, and it's up to you to recover the goods. Gain geographical and historical knowledge as you jetset from country to country in hot pursuit.

Visit local hotels, sports clubs, and other sites to gather information. People there may be able to tell you about personal traits that distinguish the crook or give you clues to the suspect's destination. When you've got the solutions, use the crime computer to secure an arrest warrant, fly to the right country, and catch the thief. You'll gain points and move up the ranks. Someday you may even catch Carmen!

Ticket Series:

Ticket to London, \$39.95

Ticket to Paris, \$39.95

Ticket to Spain, \$39.95

Ticket to Washington, D.C., \$44.95

Blue Lion Software

System: 128K, 256K IIGS (special GS version, available in November)

Ages 12 and up

The Ticket series provides a contemporary approach to learning about places, history, and culture. In Ticket to Paris you seek a lost cousin; in Ticket to London, a bowler hat; in Ticket to Spain, a family heirloom; in Ticket to Washington, D.C., a famous person.

Excellent graphics and interesting dialogue make these programs realistic—nearly as good as actual travel and at a much more reasonable cost, considering today's poor exchange rates. While enjoying and enriching yourself, you can even practice your French and Spanish—Ticket to Paris and Ticket to Spain let you play in English or in each country's native tongue.

The Rabbit Series:

Math Rabbit, ages 5–7, \$39.95, \$39.95 3½-inch

Reader Rabbit, ages 5–7, \$39.95

Reader Rabbit IIGS Talking Version, ages 5–7, \$59.95

Writer Rabbit, ages 7–9, \$49.95, \$49.95 3½-inch

The Learning Company

System: 64K; 256K IIGS (special GS version)

The Rabbit series makes for three hopping-good ways for kids to acquire basic math, writing, and reading skills. Math Rabbit uses a circus scenario to teach number recognition, number patterns, addition, and subtraction. Writer Rabbit helps kids learn parts of speech, practice sentence construction, and write their own Silly Stories.

Reader Rabbit, now available in a special "talking" version for the GS, assists children in mastering simple words through word-completion, scrambled-word, word-train (each word differs by one letter from the word before it), and *Concentration*-like word-matching games. Rabbit's voice in the GS version pronounces each word clearly and smoothly, an engaging and valuable feature. □

—C.F.

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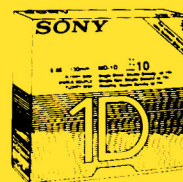
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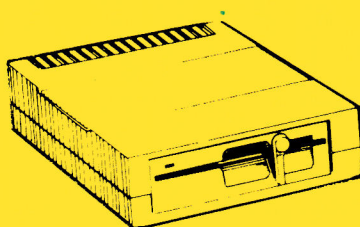
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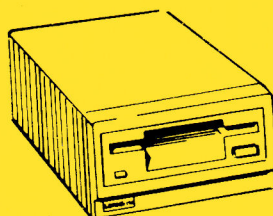
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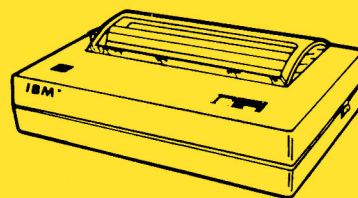


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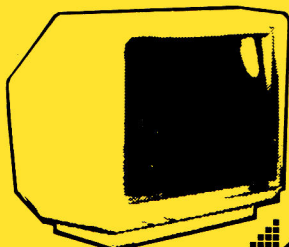
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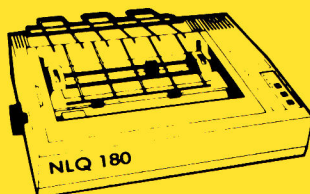
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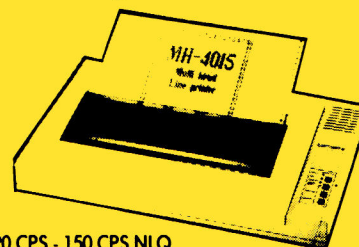
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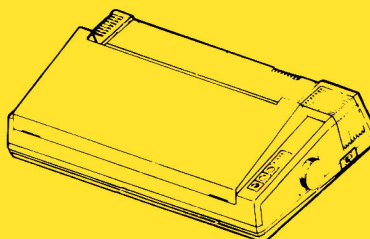


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Share the wealth—in classrooms and labs, Apple II local-area networks link students and teachers, computers and resources, in a chain of information exchange that saves schools money and streamlines file management.

by Carol Holzberg, Ph.D.

When people “network” they get together in a group to swap ideas and pool resources. Two heads—or more—are better than one, right? Apple II networking is similar: When they’re cabled together, computers can exchange programs and data and share peripherals, such as hard-disk drives, printers, and modems.

The beauty of a local-area network (LAN) is that just as people don’t lose their identities when they network, computers don’t, either. Many network systems let individual workstations operate on a stand-alone basis. In classrooms, for instance, students can proceed at their own pace on activities they’ve chosen themselves or on programs assigned by the instructor.

And just as a group of people in a meeting need a leader to determine who speaks when, to note when discussion is drifting off course, and to decide when the meeting should end, appropriate network-management software lets teachers tap into the system to observe how their students are doing, get test results, keep performance records, and generate reports on everything from attendance to exam scores.

Network systems—file or disk server, software, boards, cables—aren’t cheap. (See the accompanying glossary for definitions of networking terms.) But it’s difficult to compare costs across systems, because each one increases in price as the number of individual workstations in the system grows. The more hardware—dedicated computers and hard-disk drives—the larger your investment. And, as you’d expect, lower-cost LANs offer fewer features than higher-priced ones.





A WISE INVESTMENT

Even though LANs are expensive, price isn't the key variable in a school's decision to go with a network. Most computer coordinators say they believe networks pay for themselves in their first year of operation. Richard Paquin, computer coordinator for Winnacunnet High School in Hampton, New Hampshire, uses three CompuLynx **SchoolMaster** network systems to link 47 computers in the school's lab. Each system serves a maximum of 16 computers. Newer versions of the hardware, however, can connect as many as 32 Apple IIs, IIs, or GSs.

Paquin says he's sure the CompuLynx systems save his school money. His rationale is based on the cost of peripherals. For instance, he notes nonnetworked computers should each have two disk drives to operate efficiently. That's important when computer time is at a premium.

Disk drives cost at least \$250 each. A 16-computer lab requires 32 drives; that comes to \$8000. Because Paquin's SchoolMaster system runs without benefit of a hard-disk drive, each workstation needs its own disk drive to save data. Paquin needs to buy only 16 disk drives for his lab, at a savings of \$4000. When you include the money saved by sharing printers, it's even clearer why networks are economical.

STREAMLINING THE LAB

Financial considerations aside, there are other reasons to install a LAN. For Mike Scott, computer coordinator at Vernon Elementary School in Portland, Oregon, the most important issue is disk management. His teachers had trouble loading program disks into individual computers. As a result, they were intimidated by the technology and kept their distance from the lab.

Now with the **V-Net** system from Velan, there's no need to fuss with floppies. Teachers just type in a number on the master computer and the software loads itself automatically. Eliminating the need for disk contact makes software operation easier for students as well as teachers. Scott has configured his V-Net system so that 26 students can walk into the lab and access 26 different programs. Since the dedicated file server saves students' data to the hard-disk drive as well, there are no more incidents of mutilated floppies floundering in drives.

Time saving is another important issue for Scott. With the V-Net's *reservation* capability, his file server can deliver a specific program automatically at a particular time on a particular day when the student signs onto the system. Scott also tailors student software selection so that kids can access computer games once they've completed their lab assignments.

Consider a class of 20 students who get to use the computer lab 40 minutes a week. If the teacher has to hand out disks, wait for students to boot them up, then collect them at the end of the class period, disk management alone could take 10-12 minutes. That's 10-12 minutes fewer for individual instruction. V-Net reservation means that software is immediately accessible by all students.

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NO SOFTWARE HUNT

Ray Porter, a computer consultant with the San Francisco Unified School District, uses a 32-port Velan system to support 29 workstations and a few printers. He has several other Velan systems, including one with 64 nodes, an AT-clone file server, and a 143-megabyte hard disk. Most workstations on that system are Apple IIs.

With 700-800 programs on one file server, disk management is a major concern for Porter. The lab manager is the only person handling disks, so there's never a problem with lost or damaged programs. Porter notes that the manager can fix it so that only one of those hundreds of programs comes up on screen when the student logs onto the system.

Any number of computers can access this program, whether they're linked to the file server in the same lab room or hooked into the network from other rooms. Teachers and students can share files. Students don't have to sift through piles of program disks; teachers don't have to hunt the shelves for interesting software—they can review programs right from their own computers. Instructors can also distribute and collect assignments, tests, and other files via the network.

TIME IS MONEY

Benjamin Levy, computer coordinator for Lexington High

Networking Glossary

Access privileges. The ability to open and make changes to files and their contents. Access privileges let you control access to information stored on the server.

Bridge. A device that lets you connect similar networks to create a larger network.

Connectivity. Another word for network, or the linking of computers to share data and resources, with the capacity to communicate electronically with each other. The computers don't have to be of the same type; some link micros to minis; others link Apple IIs to IBMs and Macs.

Disk server. A hard disk with software that lets users on a network share storage space. A disk server doesn't let users on the network share files, however.

File server. Typically, a specially configured computer that functions as the central hub or command center of the network, directing and monitoring information to and from the other computers and peripherals on the system. File servers are often connected to hard disks. With the appropriate special software, it organizes programs saved on the system, loads selected programs, saves student work, handles security, queues files for the printer, accesses printers and other peripherals, transmits electronic mail, transfers data among files and workstations, stores student records, and more. Users can commonly access all files on the file-server hard disk.

School in Lexington, Massachusetts, says networked software on the school's Corvus **Omninet** system saves money, even though a network version of a program is usually three to five times the cost of the standard edition.

Without a LAN, Levy explains, serving a class of 20 students demands as many as 10-20 copies of a particular program so that children can work independently or in small groups. Otherwise, students won't get the full benefit of the software in the short time permitted for class. Lab packs or site licenses cost about the same as the network versions; if you have to buy 10-20 copies of a program because lab packs aren't available, you're paying more than you would for the network version. Add to this the time factor involved in returning damaged disks and the cost of replacing mangled or missing disks, and it becomes readily apparent why networks make good investments.

Larry Larsen, head of the computer lab at Winthrop High School, Winthrop, Massachusetts, is another advocate of Omnet. He prefers the electronic dissemination of programs on the Corvus system over the manual distribution of floppies for a variety of reasons, not the least of which is maintenance.

Before he installed the LAN, Larsen says, the disk drives in his computer labs were always causing problems. They needed aligning constantly; frequently a program would work on one drive but not on another. Keeping track of which floppies

Gateway. A device that lets different networks communicate with each other.

Local-area network (LAN). Computers hooked together or to a central server by cables. In a computer lab, machines are situated relatively close together. Computers linked in a LAN don't have to be confined to a single room, though; they may be spread out over an entire school, for instance.

Network administrator. The person responsible for monitoring and maintaining operation of the network.

Node. Any device connected to the network—a computer workstation or a printer or other peripheral, for instance.

Password. A word or set of characters that protects files or other information on the server.

Print server. A specially equipped computer that spools documents sent to the printer. A print server lets users work on their computers while they wait for their documents to be printed.

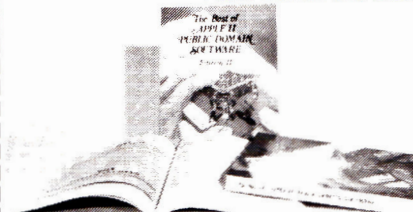
Spooler. A software application that functions as a kind of printer buffer. It receives printing requests from individual workstations, saves them to disk if the printer is busy, and lines them up to be printed. It frees the workstation to move on to other tasks during printing.

Workstation. Any individual computer hooked into the LAN. □

—C.H.

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worked where was difficult. The Corvus system eliminated the disk-drive problem and cut down on maintenance costs. All Larsen has to worry about now is the hard disk. As Mark Twain said, "Put all your eggs in one basket. And then watch that basket"—it's easier than watching 20.

Hard disks *are* convenient—all your programs and files are in one place, so access time is negligible. But hard disks have their down side, as well. If the hard disk crashes and loses your data, the lab can't function until you reconfigure the system. Recopying program disks to the hard disk is the least of your worries, even though a 45-megabyte hard disk may take as long as two hours to recopy. A more serious crisis develops if teachers and students have never backed up their data files. The originals are irreplaceable; if your network uses a hard disk, back up the file server as frequently as possible. It's crucial.

While LANs offer great potential for file and peripheral

sharing as well as long-term money savings, installing a network system isn't as easy as buying a computer and plugging it in. You may have to attach cables to special cards, then install them in individual computers. Other cables run from workstations to the central disk or file server. You'll have to configure your file server and upload network versions of your programs to the hard disk. System prices may or may not include installation and in-service training.

Shop around and consider all the options before you take the network plunge. There are several alternatives from which to choose. The one you select for your lab will depend on the number and kinds of computers you want to link, the number of students using the system, and the programs in your library.

The Corvus network has been around the longest. Software publishers introducing network versions of their products are more likely to develop software that works with Corvus than

Networking with Apple II AppleTalk

There's a new kid on the network block—it's Apple's own AppleTalk network. Until recently, AppleTalk worked only on Macintosh computers, primarily to link multiple Macs to a single LaserWriter printer. Now schools with IIe and IIGS labs (as well as Macs and MS-DOS systems) can become part of the AppleTalk network bridge. AppleTalk systems still require a Mac to function as a dedicated file server, because Apple's file-server software, AppleShare, runs only on Macs. You can't use a Mac as an individual workstation on this system if it's also a file server. (You can link other Macs to the system.)

To install AppleTalk, you'll need special Workstation cards for your enhanced 128K IIes (the GS has a built-in AppleTalk port), a new version of ProDOS 16 for the 512K GS (already built into the ROM on the Apple II Workstation card), and a LocalTalk Connector Kit for each node (device) on the system. Each node attaches via the connector box to the next one in line on the chain. If you want print-spooler capabilities, you'll also need to purchase AppleShare Print Server software. Connecting an ImageWriter II or LQ to the system requires an additional AppleTalk Option card installed in the printer, plus a system connector.

AppleShare works with ProDOS, as well as the Mac

and MS-DOS operating systems. Programs using DOS 3.3, Pascal, or CP/M won't function on AppleTalk. You can link 32 devices in a single AppleTalk network, spread out over a distance of up to 1000 feet. However, you can bridge networks together, so there's no real limit to the size of an AppleTalk network.

Given its operating-system limitations, AppleTalk may not be the network solution for everyone—a significant number of good networkable programs still operate under DOS 3.3. Moreover, AppleShare hasn't been around as long as some of the other file-server programs. It probably will need some time to proceed along its evolutionary path before all the bugs are worked out. And you may not have a Macintosh to

use as a dedicated file server, or the budget to replace your software with networkable programs.

For example, Claris is expected to release a network version of AppleWorks by early fall. The \$1616 price tag is pretty steep, even when you consider that AppleWorks lab packs cost \$1414 apiece. You won't need individual disk drives to run the program—the network administrator will store it on the AppleShare file-server hard disk. Students will be able to save their work on the file-server hard disk, too. □ —C.H.

AppleTalk Glossary

AppleShare. Software that manages the file server on the AppleTalk network.

AppleShare aware. Apple II ProDOS or Macintosh software you can start from the AppleShare file server.

AppleTalk-compatible printer. A printer you can use with the AppleTalk network and LocalTalk cabling.

Aristotle software. Software designed to provide a menu-driven method for selecting ProDOS applications from an AppleShare file server.

LocalTalk cable system. Standard cabling system that connects computers and network devices on the AppleTalk network.

Multilaunch. A phrase used to describe applications that permit two or more users to launch a single copy of the program. □

with any other network. Make sure the programs you select will work on your particular system. Whatever your software choice, remember that your network should run only those programs licensed to operate in a particular site.

The initial price of a network may seem high at first, but keep in mind that networks reduce the need for floppy-disk drives and printers, while creating a coherent lab out of an inefficient jumble of incompatible computers.

Networks reduce technophobia because instructors don't have to deal with equipment or floppies; the days of nonfunctional or missing disks will be gone forever. And with the money you save on peripherals, your lab might be able to invest in a laser printer for those special high-quality printing jobs, a modem for on-line communication, or sophisticated courseware specifically designed to take advantage of network tasking.

Best of all, instructors can stop struggling with equipment and spend more time *teaching*. And that's what computers in

the classroom are all about—freeing both teachers and students to reach their creative potential.

Stay tuned. Next month, *inCider* presents a more detailed look at the technology of networking plus a rundown of specific systems, including AppleTalk, Omninet, **Constellation III** from Corvus, SchoolMaster, V-Net, **ELAN** from Lan-Tech Corporation, **ClassWorks** from Computer Networking Specialists, Inc., and **Caretaker Plus** and **Master Switch** from Rose Electronics. ■

Carol Holzberg is a free-lance journalist and frequent contributor to inCider's Reviews section. Write to her at P.O. Box 242, Shutesbury, MA 01072. Enclose a self-addressed, stamped envelope if you'd like a personal reply.

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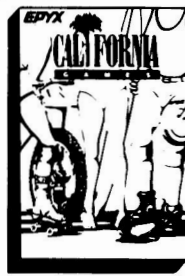
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WPC BRIDGE



by Eric Grevstad, Contributing Editor

It's not just another PC clone—Cordata's WPC Bridge is two computers in one. Move over, MS-DOS—Apple II programs are sharing the spotlight.

No, you're not reading the wrong magazine. Yes, this is *inCider* and that's a PC clone in the photo—an Intel 8088-powered IBM compatible, with slightly different styling and video modes but the same software library as a million other MS-DOS machines. The Cordata WPC Bridge, however, does something other IBM clones can't. It runs Apple II programs.

The \$1695 Bridge is basically Cordata's WPC (Wizard PC), a compact compatible sold alone for \$600 less, with a 65C02 coprocessor board plugged into one of its expansion slots. As such, it's the mirror image of a IIe with Applied Engineering's PC Transporter card. (See our feature review, "PC Transporter: The Best of Both Worlds?" in June 1988, p. 77.) A Transporter

system is an Apple, until you run a special ProDOS program that activates the PC hardware; the Cordata is a PC, until you run a special MS-DOS program that puts it into Apple mode. Both units' keyboards, disk drives, and monitors serve double duty for Apple and IBM software.

As coprocessors go, the WPC Bridge seems based on older technology than PC Transporter. While it runs AppleWorks and other IIe/IIc programs, its maximum-compatibility mode emulates a 64K Apple II Plus. It doesn't support Apple 3.5 drives, and it comes with a DOS 3.3 master disk. In some convenient ways, from keyboard and clock/calendar sharing to transferring data files between systems, PC Transporter is superior.

Against that, PC Transporter is a card with a bunch of cables,

requiring a half hour's installation work and two types of 5¼-inch disk drives; the WPC Bridge is a handy pre-assembled package. Cordata has convenience on its side and some attractive program-switching abilities up its sleeve.

THE IBM SIDE

Formerly one of the initial manufacturers of PC compatibles (under the name Corona Data Systems), Cordata is now a subsidiary of Daewoo, the Korean giant that builds everything from the Leading Edge Model D to the Pontiac LeMans as well as the WPC. The machine's internal Apple emulator is the Trackstar card from Diamond Computer Systems of Sunnyvale, California. The Trackstar has been around for some time, sold by Diamond itself and by Radio Shack for Tandy 1000s battling for Apple classroom sales, but Cordata has modified the card's cabling and software in creating the all-in-one WPC package.

Besides MS-DOS 2.11, Cordata bundles the Bridge with disk-based tutorials for the computer and operating system and with Alpha Software's Electric Desk, a 1984-vintage integrated program. It's friendly for beginners and deft at split-screen switching among word-processing, spreadsheet, database, and communications jobs, but it's not one of the PC programs that tempt people to give up AppleWorks. Cordata MS-DOS 2.11 omits BASIC and skimps on the more powerful utilities found in today's MS-DOS 3.3, but includes a pleasant menu shell to supplant the stark `A>` prompt.

The most prominent difference between the WPC and other clones is its one-piece design, with a 12-inch monochrome monitor built into the system instead of sitting separately on top. It makes the Bridge a bulky load to haul out of its box, but a snap to plug in and get started.

Parallel and serial interfaces and a port for an RGB color monitor are standard, leaving three expansion slots free for IBM-style add-in cards; a fourth slot is filled by the coprocessor board, which has Apple joystick and composite and RGB-video ports. While my Tandy RGB monitor worked with the Bridge port for Apple software, it didn't work with the machine's own port for MS-DOS.

Luckily, the Bridge's built-in video is among its best features. MS-DOS text is as crisp as that of other monochrome PC displays, compared with the fuzzier characters of RGB or composite screens, yet the system runs CGA (Color/Graphics Adapter) software, showing colors as 16 shades of green. It also offers the AT&T 6300's sharp 640-by-400-pixel resolution for MS-DOS programs that support it.

Under the hood are familiar clone components: 512K of RAM (expandable to 768K), two 5¼-inch 360K disk drives, and an 8088-2 CPU (central processing unit) running at 8 megahertz (MHz). The Bridge ran every piece of PC software *inCider* gave it, finishing benchmark tests about 40 percent faster than an original PC, and 50 percent more slowly than PC Transporter.

The WPC's 84-key keyboard resembles IBM's original AT unit

with the current "enhanced" layout's horizontal row of function keys. Its coiled cord and light weight make it attractive for lap use and its typing feel is good, but our test unit was plagued by a spacebar that sometimes stuck down.

THE APPLE SIDE

Our review unit arrived with Diamond's own Appemumod (a catchy term for "Apple emulation mode") software, an uncopyable hybrid disk with both MS-DOS and Apple DOS 3.3 tracks. During our tests, Cordata sent a prerelease version of its more friendly Bridge Boot, a conventional MS-DOS disk with an AUTOEXEC.BAT file that activates the Apple coprocessor along with booting the PC side.

A setup program lets you set parallel and serial port parameters and choose a WPC drive to be the Apple boot drive (slot 6, drive 1)—normally the lower or B: drive, so that you can keep an MS-DOS disk in drive A:. You can send Apple video to the built-in screen or a monitor plugged into the Bridge board. An Apple joystick plugged into the board works only for Apple, not IBM, games.

The Bridge program activates the coprocessor, giving you a choice of standard or "special compatibility" initialization before booting your Apple disk. The second choice requires you to insert an Apple DOS 3.3 master disk so that the Bridge can load FPBASIC and simulate a 64K II Plus. In another belated improvement during our tests, Cordata realized that many of today's users have never seen a DOS 3.3 master disk and obtained a license from Apple to supply one with the computer. (Apple veterans will feel nostalgic at the sight of those old Integer BASIC programs FID, Muffin, Apple-Vision, Biorhythm, and Brian's Theme.)

Thanks to the coprocessor's 128K memory and Language Arts ROM (the same firm that wrote the code for the Laser 128), the Bridge normally emulates an unenhanced IIe. Its double-sided 5¼-inch drives can read, write, and format single-sided Apple disks, though the WPC drives are occasionally balky about booting; it took several tries to overcome "unable to load ProDOS" errors with one AppleWorks startup disk. The Trackstar card lets you connect an Apple 5¼-inch drive to eliminate such problems, particularly for older or copy-protected Apple programs.

Once loaded, Apple software runs smoothly. AppleWorks 2.0 worked like a charm, even printing to the same WPC parallel port and Epson printer used for MS-DOS. MECC's Number Munchers, a tough compatibility test, booted and ran on the second try. Other successes included MultiScribe 2.01, Fantavision, Homeworker 2.1, DoReMe 2.0, Accolade's Comics, and Where in Europe Is Carmen Sandiego?

Golf's Best hooked into the rough in IIe mode, but was fine in II Plus mode (and was the only such program we encountered). Two Activision games (Garry Kitchen's Game Maker and The Rocky Horror Show) played their opening music at a murky,

moaning half speed, but the games themselves were no slower on the Cordata Bridge than on an Apple. Neither were spreadsheet or word-processing benchmarks.

GOOD AND BAD POINTS

While earning high marks for compatibility, the Bridge isn't an Apple user's dream. It can't read the MS-DOS date and time to set the ProDOS clock. (Applied offers a utility that lets PC Transporter do the reverse.)

Not only does Apple text appear a bit sketchy on the built-in monitor (unless you turn the brightness up enough to make the background shine), but it's unenhanced instead of enhanced IIe or IIc text. Hi-res and double-hi-res graphics programs are fine, but mousetext characters are missing. The open-apple symbol is an inverse A, and vertical and horizontal lines are divided into bars and hyphens. AppleWorks file folders look like coupons.

The Cordata keyboard is built for MS-DOS first and Apple second, so Apple typists will have to adjust: The escape key is at the right, not left, end of the number row, and the delete key (Apple backspace) on the lower instead of upper right. The IBM backspace, in the Apple delete key's place, is a plain left arrow in Apple mode.

Using function keys F9 and F10 for open- and solid-apple keys was a good choice when they were placed near the left shift key, as on original PC keyboards (when the Trackstar was designed). The WPC's horizontal row puts these keys top center, above the numbers 8 and 9, making AppleWorks commands a two-handed tangle.

The Bridge software, however, has some sophisticated functions. Pressing Escape, then F1, then Escape again summons a useful pop-up menu, where you can press R to reset (Control-Reset) or B to reboot (Control-Open apple-Reset) the system. You can also save and switch among eight sets of macros, assigning Apple strings (up to 26 characters each) to the function keys F3 through F8—a company name or other phrase you type often in AppleWorks, or RUN or LIST and a carriage return in BASIC. PC Transporter won't let you do that.

Nor will Transporter let you flip between an Apple and an IBM program in memory at once by pressing Alt-Esc. Since the Apple emulator has its own memory as well as CPU, the WPC RAM (minus 53K) and 8088 are still available for MS-DOS. You can start an AppleWorks spreadsheet recalculation, switch to MS-DOS, then return to find AppleWorks has finished the job.

Cautious users may want to switch to the A> prompt only to load, work with, and quit a PC program instead of leaving an MS-DOS application in progress. Cordata's second-edition Bridge software seems to fix a problem with the first edition, where switching to an Apple program and back would trash the MS-DOS video memory and screen display, but things still aren't perfect. When I changed a number in an AppleWorks

worksheet, I found that number and carriage return inserted at the cursor in my MS-DOS WordStar document.

Still, the machine's memory-resident menu and mode-switching ability are impressive enough to make you fantasize about some sort of on-screen, cut-and-paste data transfer between the systems, like that between PC programs under Microsoft Windows or SideKick. Forget it. Cordata's transfer utility (BRUN FILE TRANSFER on the DOS 3.3 system master) translates text or DIF files between IBM and Apple DOS 3.3 disks, and does it well, but you'll need a utility such as the ProDOS Filer or Copy II Plus to convert the DOS 3.3 files to ProDOS. PC Transporter's slick ProDOS transfer program wins this part of the competition in a walk.

CONSIDERING THE COSTS

The WPC Bridge works pretty well. Its one-piece design, sturdy construction, and friendly menus clearly point the unit at the classroom market, where its performance with IBM software and Apple educational programs is good, though its lack of a IIc-style volume control makes WPC games awfully noisy.

But individual buyers, even those wanting mostly to work in MS-DOS with a few Apple programs for the kids, will find the price of a WPC Bridge buys a comparable PC clone plus a Laser 128 and monitor, whose Apple screen display is easier on the eyes.

If you already have an Apple and want MS-DOS as a secondary option, the Cordata Bridge costs more and runs more slowly than a PC Transporter card with the necessary disk drives. The Bridge is the second-best IBM/Apple II hybrid in America, but that may not be a recipe for success. ■

Eric Grevstad is a political columnist and free-lance journalist specializing in computers and technology. Write to him c/o inCider, 80 Elm Street, Peterborough, NH 03458. Enclose a self-addressed, stamped envelope if you'd like a personal reply.

Product Information

WPC Bridge

Cordata Technologies Inc.
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Compton, CA 90220
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\$1695
(800) 621-6764
(800) 331-5867 (CA)

Reader Service No. 305

Cash-Flow Trilogy: Part 1

An AppleWorks spreadsheet lets you go back to the future to determine your current and projected cash flow.

by Ruth K. Witkin

Every business experiences cash cycles. When customers pay for goods and services, cash increases. When the business pays its suppliers, cash decreases. The difference between inflow and outflow of funds is called cash flow. From the corner store to a Fortune 500 company, the survival of a business depends on forecasting cash flow with reasonable certainty.

In this session, the first of three parts, let's assume you run a company that designs and manufactures sports equipment. The accompanying **Figure** shows a spreadsheet that lets you project and control cash flow for a three-year period. (It can work just as well on a quarterly, monthly, or weekly basis.) To use it, you simply type in cash sales, cash disbursements, and loan repayments and, in the *Proj* column, indicate an increase, a decrease, or status quo for each item.

The formulas then calculate cost of goods sold, gross profit, payroll taxes, total cash disbursements, cash flow before taxes, taxable income, corporate income taxes, cash flow after taxes, MACRS (Modified Accelerated Cost Recovery System), depreciation, and—in the second and third years—all of the above plus projected cash sales and disbursements.

This powerful spreadsheet is too long to describe fully in one column, so you'll design the format and create the formulas this month, then finish up next month. The final episode—coming to your small screen in November—explains how to cut and paste the spreadsheet into a memo.

A SPREADSHEET FROM SCRATCH

When you see such key combinations as OA-L, hold down the open-apple key and type L. Keys OA-1 through OA-9 (the

AppleWorks Ruler) jump the cursor vertically through the spreadsheet in proportional increments. Hold down the open-apple key and type the number.

Use the Startup and Program disks to make a new file for the spreadsheet. Name this file **CASHFLOW**. You should now see the Review/Add/Change screen with the cursor in A1. Follow this summary to set up the spreadsheet:

•**Column width.** Each column is now nine characters wide. Use the Layout command (OA-L) to increase the width of column A to 25 characters and reduce columns C, F, and I to eight characters.

•**Labels.** Referring to the **Figure**, enter the labels in column A and in rows 1 and 3. To indent labels in column A, type quotation marks and press the spacebar once before typing the label.

•**Lines.** Use an equal sign to enter lines across rows 2, 30, and 41 (columns A to I). Type quotation marks first, then hold down the equal-sign key. Use a minus sign to enter a line across row 32. In B4, type quotation marks, then 17 minus signs. In D4, type quotation marks, press the spacebar four times, and type 14 minus signs. In B7, type quotation marks, press the spacebar once, and type seven minus signs. In C7, type quotation marks, press the spacebar twice, and type six minus signs. You'll enter other lines when you copy the formulas.

•**Formats.** Use the Value command (OA-V) to set a standard value of Commas with zero decimal places for the entire spreadsheet. Use the Layout command (OA-L) to format the following cells: C5 and C6 for percentage with one decimal place (when you copy the formulas, you'll copy the percentage format to other cells

=====A=====B=====C=====D=====E=====F=====G=====H=====I=====									
1	September 1988	CASH FLOW ANALYSIS							
2									
3		YEAR 1	P/Sales	Proj YEAR 2	P/Sales	Proj YEAR 3	P/Sales		
4									
5	Cash Sales			0	8		0		
6	Cost of Goods Sold		ERROR 7	0	9	ERROR	0	ERROR	
7									
8	Gross Profit	0	1	ERROR	0	ERROR	0	ERROR	
9									
10	Cash Disbursements:								
11	Salaries			0	ERROR		0	ERROR	
12	Payroll Taxes	0	2	ERROR	0	ERROR	0	ERROR	
13	Rent			0	ERROR		0	ERROR	
14	Advertising			0	ERROR		0	ERROR	
15	Loan Repayment			0	ERROR		0	ERROR	
16	Insurance			0	ERROR		0	ERROR	
17	Office Expenses			0	ERROR		0	ERROR	
18	Utilities/Phone			0	ERROR		0	ERROR	
19	Maint & Repairs			0	ERROR		0	ERROR	
20	Professional Fees			0	ERROR		0	ERROR	
21									
22	Total Cash Disbursements	0	3	ERROR	0	ERROR	0	ERROR	
23									
24	Cash Flow Before Taxes	0	4	ERROR	0	ERROR	0	ERROR	
25									
26	Less: Income Taxes			0	10	ERROR	0	ERROR	
27									
28	Cash Flow After Taxes	0	5	ERROR	0	ERROR	0	ERROR	
29									
30									
31	WORK AREA								
32									
33	Capital Equip Purchase								
34	Depreciation (MACRS 5-yr)	0	6		0		0		
35	Principal Repayment								
36									
37	Taxable Income			0	11		0		
38	Income Tax Schedule:								
39	Less than \$75,000			0	12		0		
40	\$75,000 or more			0	13		0		
41									

Figure. Lines, labels, and formulas on cash-flow-analysis spreadsheet.

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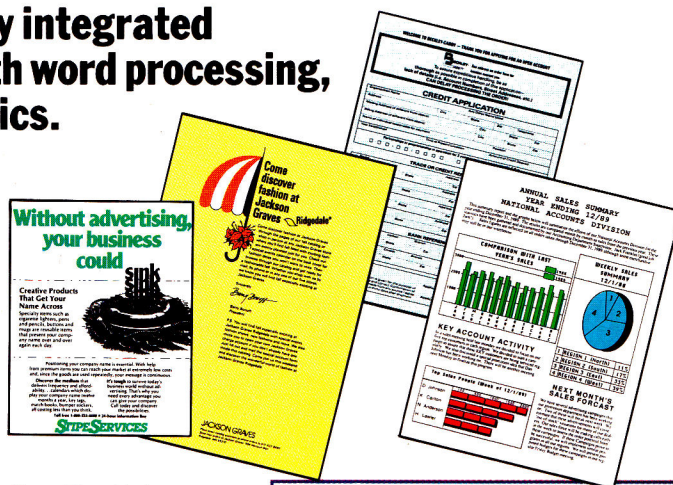


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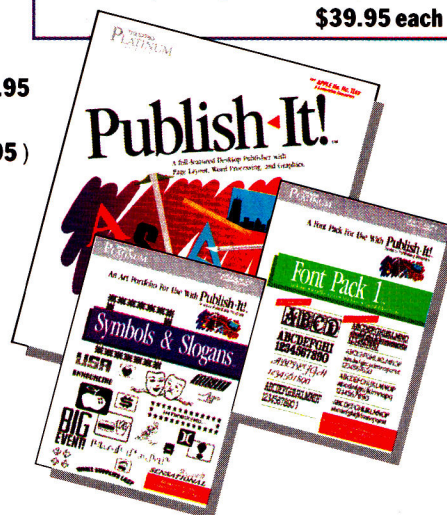
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that need it); D5 through D20 for percentage with zero decimal places; B39 and C39 for appropriate; right-justify row 3, then center the labels in B3, E3, and H3.

This completes the setup, so press OA-S to store your work on disk.

ENTERING THE FORMULAS

The **Figure** also shows formula locations. First, read how the formula works. Then place the cursor on the cell receiving the formula. Move the cursor to the cell locations shown in the formula description and type everything else. When the formula is complete, compare it with the one in the description. If they agree, press Return. If you have a problem with a formula, press Escape and start again.

Because you'll be copying formulas to other locations, you'll want to protect a formula immediately after creating it. This saves steps later on because copying the formula also copies the protection. To protect, first press OA-V, then type **PY**. This step lets you protect the entire spreadsheet. Now leave your cursor on the formula cell and press OA-L. Press Return to confirm *Entry*. Type **PN** to select *Protection Nothing*.

FORMULA 1: GROSS PROFIT

Formula 1 subtracts the cost of goods sold (B6) from cash sales (B5) and enters the gross profit in B8.

Cell location: B8

Description: + B5 - B6

Remember, protect Formula 1 and all other formulas as soon as you create each one.

FORMULA 2: PAYROLL TAXES

Formula 2 multiplies salaries (B11) by 20 percent, which approximates the amount paid in payroll taxes, and enters the result in B12.

Cell location: B12

Description: + B11*.2

FORMULA 3: TOTAL CASH DISBURSEMENTS

Formula 3 adds cash disbursements in column B, rows 11 through 20, and enters the total cash disbursements in B22. Including B10 (a blank cell) and B21 (con-

taining the line) in the formula lets you insert rows anywhere between these cells later on. AppleWorks will adjust Formula 3 to add the new items.

Cell location: B22

Description: @SUM(B21..B10)

FORMULA 4: CASH FLOW BEFORE TAXES

Formula 4 subtracts total cash disbursements (B22) from gross profit (B8) and enters the cash flow before taxes in B24.

Cell location: B24

Description: + B8 - B22

FORMULA 5: CASH FLOW AFTER TAXES

Formula 5 subtracts corporate income taxes for the preceding year (which you'll be typing into B26 shortly) from cash flow before taxes (B24) to produce cash flow after taxes in B28.

Cell location: B28

Description: + B24 - B26

FORMULA 6: MACRS DEPRECIATION

Formula 6 calculates MACRS depreciation on the amount of capital equipment in B33 and enters the result in B34. Depreciation, while not a cash item, appears in the work area of the cash-flow statement because you need it to compute taxable income. Depreciation is based on the MACRS five-year schedule, which provides for a 20 percent allowance in the first year, 32 percent in the second year, and 19.2 percent in the third year.

Cell location: B34

Description: + B33*.2

COPYING THE FORMULAS IN GROUPS

Now copy Formulas 1 through 6, including the lines in B7 and B21, from Year 1 to Year 2. (Are all six formulas protected?) Place the cursor on the line in B7. Press OA-C to start the Copy command. Press Return to confirm *Within worksheet*. Press OA-8 to highlight the area to B36, and hit Return again.

Move the cursor to E7 and hit Return again. AppleWorks now asks whether B5 is *No change* (an absolute cell reference)

or *Relative*. Both B5 and B6 are relative, so type **R** twice. All the other cell references, except B33 (Depreciation in B34), are relative. When B33 is highlighted at the bottom of the screen, hit Return (not R). With the other highlighted cells, type **R** each time.

Press OA-S to store the spreadsheet on disk.

FORMULA 7: COST OF GOODS SOLD AS A PERCENTAGE OF SALES

Formula 7 calculates the cost of goods sold in Year 1 (B6) as a percentage of cash sales in Year 1 (B5) and enters the result in C6.

Cell location: C6

Description: + B6/B5

ERROR appears because Formula 7 is dividing by B5, an empty cell. Refer to the **Figure** to see that Formula 7 produces the percentage of sales for each item in Year 1. Lines and empty cells in the column mean you'll have to repeat the Copy command. That requires several repeated steps.

A more efficient approach is to copy down the column, then use the one-step Blank command to erase a formula in a cell that doesn't need it. First the copy: Leave the cursor on C6 and press OA-C. Press Return twice. Move the cursor to C8 and type a period. Move the cursor to C28 and hit Return again. Cell B6 is *Relative* and B5 is *No change*, so type **R** once and hit Return.

Now start the blanking process: Place the cursor on C9 and press OA-B. Type **B** for *Block*, press the down-arrow key, and hit Return. Type **Y** to clear the protected cells. Next, move the cursor to C21, press OA-B, then hit Return. Type **Y**. Leave the cursor on C21 and enter a line: Type quotation marks, press the spacebar twice, and type six minus signs. Use OA-B to blank C23, C25, and C27.

Next, copy Formula 7 from Year 1 to Year 2: Place the cursor on the line in C4, press OA-C, and hit Return. Press OA-7 to highlight the cells to C31 and hit Return again. Move the cursor to F4 and hit Return again. All cell references are relative, so hold down **R** until you've copied everything.

Taxable Income		Tax Rate
First	\$50,000	15%
Second	\$25,000	25%

Next, copy Formula 7 from Year 1 to Year 3: Leave the cursor on C4 and press OA-C. Press Return, then press OA-7 and hit Return again. Move the cursor to I4 and hit Return again. Hold down the **R** key.

FORMULA 8: CASH SALES IN YEAR 2

Formula 8 calculates cash sales in Year 2 (E5) based on cash sales in Year 1 (B5) multiplied by the projected amount in D5.

Cell location: E5

Description: $(B5 * (1 + D5))$

Now copy Formula 8 to E11: Leave the cursor on E5 and press OA-C. Press Return twice. Move the cursor to E11 and hit Return again. Type **R** twice. Leave the cursor on E5 and copy Formula 8 again: Press OA-C and hit Return twice. Move the cursor to E13 and type a period. Move the cursor to E20 and hit Return again. Type **R** twice. Now press OA-S to store the spreadsheet on disk.

Table. Corporate tax schedule.

FORMULA 9: COST OF GOODS SOLD IN YEAR 2

Formula 9 calculates cost of goods sold in Year 2 (E6) based on cash sales in Year 2 (E5) multiplied by the projected amount in D6.

Cell location: E6

Description: $+E5 * D6$

FORMULA 10: INCOME TAXES IN YEAR 2

Formula 10 uses the IF function to produce one of two answers. IF works with three statements: Test, Then, and Else. The Test statement looks at taxable income in E37. If this amount is less than \$75,000, the Then statement copies the amount calculated by the formula in E39. If taxable income is \$75,000 or more, the Else statement copies the amount calculated by the formula in E40. (Patience—you'll soon find out what calculations the formulas in

E39 and E40 are performing.)

Cell location: E26

Description: $@IF(E37 < 75000, E39, E40)$

FORMULA 11: TAXABLE INCOME

Formula 11 enters taxable income in Year 1 in E37. The formula adds cash flow before taxes (B24) and principal paid on the loan (B35), then subtracts depreciation (B34).

Cell location: E37

Description: $+B24 + B35 - B34$

FORMULA 12: TAX ON INCOME OF LESS THAN \$75,000

Formula 12 calculates income tax when taxable income is less than \$75,000 and enters the result in E39. The current corporate tax schedule is shown in the accompanying **Table**. Formula 12 recognizes each rate level, or fraction thereof, and applies the proper percentage. It uses the MIN (minimum) and MAX (max-

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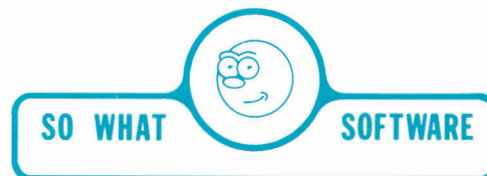
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imum) functions to define upper and lower limits.

The Test statement in the IF formula looks at taxable income in E37. If this amount is greater than \$0 and less than \$75,000, the Then statement computes the taxable income and enters the result in E39. If this amount is less than \$0 (a negative taxable income) or \$75,000 or more (the province of Formula 13), the Else statement enters a zero in the cell.

Formula 12 is a l-o-n-g formula. Two interesting techniques let it fit into one cell:

1) The formula works with five-digit numbers (50000 and 75000). You'll enter these numbers in cells B39 and C39 and let the formula refer to cell locations, which reduces by two characters each use of a number.

2) The formula contains 76 characters, but you can fit only 69 characters on the entry line. The edit line, however, allows 76 characters, so you'll enter only the first part of the formula in the cell, then edit in the rest.

Cell location: E39

Description: @IF(@AND(E37>0,
E37<C39),@MIN
(B39,E37)*.15) +
@MAX(0,@MIN
(B39,E37 - B39)*.25),0)

First, type this part of the formula:

@IF(@AND (E37>0,E37<C39),
(@MIN(B39,E37)*.15),0)

Now press Return. Leave the cursor on E39 and press OA-U to start the Edit command. Press the right-arrow key until the cursor is on the comma before the zero at the end. You're still working with the insert cursor (the blinking underline). Next type this part of the formula:

+ @MAX(0,@MIN(B39, E37 - B39)*.25)

Before pressing Return, proofread each character to be sure it matches the formula shown in the Description.

FORMULA 13: TAX ON INCOME OF \$75,000 OR MORE

Formula 13 calculates the corporate tax

on taxable income of \$75,000 or more and enters the result in E40. The Test statement looks at taxable income in E37. If this amount is greater than or equal to \$75,000, the Then statement adds \$13,750 to the result of multiplying taxable income minus \$75,000 by 34 percent, and enters the result in E40. If the amount is less than \$75,000 (the province of Formula 12), the Else statement enters a zero in its cell.

Cell location: E40

Description: @IF(E37>=75000,
13750 + (.34*
(E37 - 75000)),0)

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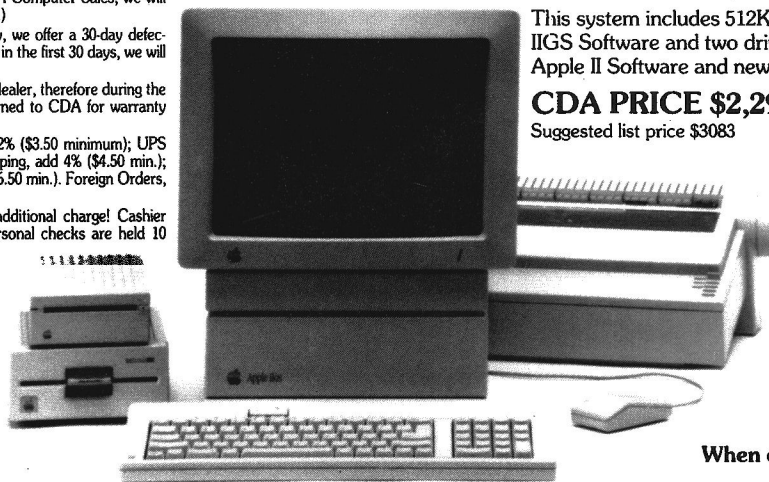
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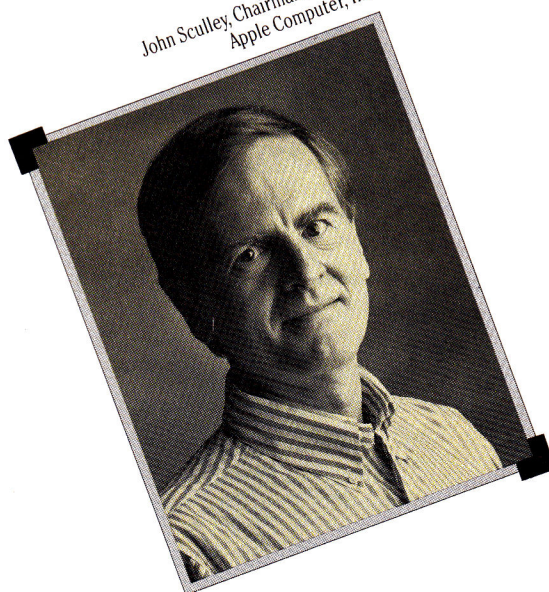
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by Dan Bishop

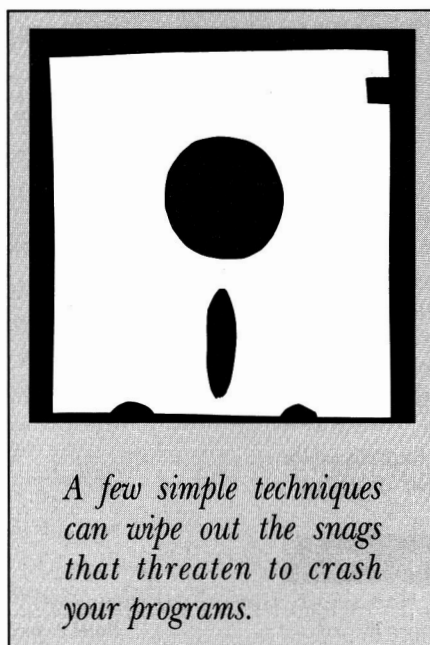
Maybe it's the warmer weather; maybe it's just being outside more often. But during these late-summer days I keep thinking about bugs—the computer kind as well as the six-legged variety. The difference between the two wasn't always so far removed. Admiral Grace Hopper (U.S. Navy, retired) is often credited with coining the term “bug” in the very early years of computing, when a computer malfunction was traced to a moth that had short-circuited the machine's electrical connection. And bugs have been plaguing computer programmers ever since.

This month let's look at several common debugging techniques. I'll also detail a number of factors to watch for if you're converting an Applesoft BASIC program from Apple DOS format to ProDOS.

WANTED—EAGLE EYES

I can often determine the popularity of a particular listing by the number of letters I receive detailing problems people have getting the program to run. Occasionally the problem results from my not having tested a program sufficiently to catch a bug. But much more frequently the problem lies with undetected typos in the reader's copy of the program. It's frustrating to spend several hours typing in a program only to find it doesn't work.

Technical Editor Bill Kennedy's Applesoft Program Proofer (Apple Clinic, August 1988, p. 24) helps in this regard. After loading Program Proofer into your Apple's memory, type in your BASIC program (or load it from disk), then type in CALL 768, and LIST your program. Highlighted numbers appear after every line in your listing. Your first step in proofing your program is to see whether the highlighted numbers in your listing



Jan Muller

match the bracketed numbers in *inCider's* listing. If a line matches, you've typed it in correctly.

Program Proofer has no way of letting you know whether you left a line or two out of your listing. Spend a few minutes reading the line numbers down the left edge of your listing, checking against *inCider's* listing to verify that all lines are present and accounted for.

WHERE, OH WHERE?

When you take your newly entered program out for a test spin and it crashes, Applesoft tells you where the crash occurred, as in BREAK IN LINE 1265. Unfortunately, the problem may be far removed from the indicated line number. Consider this line:

```
780 RQ = (AB + 100) / (CO * 12)
```

Say you run this program and get a DIVISION BY ZERO error in line 780. What do you do? The line certainly looks okay.

Applesoft keeps all variables intact when a program crashes. Because you can use the LIST and PRINT commands from command (immediate) mode, you can find the current values for the affected variables. Type in this line:

```
PRINT AB, CO
```

Your Apple shows 733 and zero. That explains the division-by-zero problem, but *why* is CO equal to zero? First check through the entire program to see whether you mistakenly typed 0 (zero) instead of the letter O for the variable CO (a common typo), leaving CO undefined.

Let's say you verified that all occurrences of CO in your program are correct, including the line assigning a value to CO:

```
420 CO = LI * 42.731 / BG
```

There's the problem. Your program uses LI (one), not LI (eye). LI (eye) is undefined, so line 420 assigns zero to CO.

The situation gets even worse if a program uses variable names that have the same first symbol and end in one and I, or zero and O. There's no reason why you shouldn't use such names, but you must be especially careful to enter them correctly.

LET'S GO FOR A WALK

When you can't drive your program because of errors, try taking it for a walk. Start reading through your program from the first line. As you encounter variable names, write them down on a blank sheet of paper, along with their current values in a chart-like form. Each time a variable's value changes, cross out the old value and write in the new one.

When you encounter a FOR/NEXT loop, imagine rereading the lines within the loop as many times as the FOR command requires, and write down the value

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each variable must have when your Apple exits the loop.

When the program tells you to GOTO another line, start reading at that new line, skipping any lines between the spot you were on and the place to which you advanced. If the jump is a GOSUB, make a note of the current line number on your chart, as you'll be returning to it, then start reading at the new line specified by the GOSUB command. When you encounter a RETURN, go back to the line you originally left and continue walking through your program from there.

Pay attention; try to visualize what's happening in your program; and, more importantly, try to catch the error that crashed your program. When you do find an error, ask yourself whether the error you're correcting now is a reasonable explanation for the program crash. You may be correcting an error that had nothing to do with the problem you observed

originally. If there seems to be no relation, keep walking until you find the sought-after error.

Walk-throughs are especially good at locating typos in jumps, such as GOSUB 2050 instead of GOSUB 250; you suddenly find yourself in a part of the program where you shouldn't be. If you're confused, think how your poor Apple must have reacted!

PRODOS COMPATIBILITY

After offering my Tax-Info Organizer (March 1988, p. 98) on disk for \$6, I realized that programming in DOS format was giving many of you ProDOS users unnecessary headaches. All future programs in Applesoft Adviser will be compatible with both Apple DOS and ProDOS.

When using ProDOS, you must adhere closely to several restrictions it places on filenames and program names. Instead

of the 30-character names Apple DOS allows, ProDOS requires that a filename have no more than 15 characters total. (This still beats the eight-character restriction in the MS-DOS world.) Furthermore, ProDOS doesn't let you embed blank spaces in a filename. To separate words, you have to use periods.

To convert an Apple DOS file or program name to a valid ProDOS name, you may have to shorten the name, abbreviating if necessary, and replace blank spaces with periods. The periods count as characters in the 15-character restriction, so be sure to count them. Consequently, you'd have to rename a program called TAX INFO ORGANIZER on an Apple DOS disk to, say, TAXINFO.ORG for ProDOS.

When typing a program into your computer, watch out for these program names. Usually they'll follow disk-file commands, such as OPEN, READ, WRITE, DELETE, and CLOSE. If you spell out the name right there in the listing, you'll have no problems. Simply be sure to catch every occurrence in the program.

Often the name will appear as a variable, say F\$. You must then look through the listing to find where it assigns the name to F\$ and make the changes there. It might be a simple assignment statement:

F\$ = "TAX INFO ORGANIZER"

It might be a DATA statement the program reads, as in READ F\$. (Don't confuse this use of READ with a disk-file READ command, which always appears in quotes as part of a PRINT command, such as PRINT D\$;"READ ";F\$.) In this case, you must find the DATA statement and change the name there, as in DATA TAX INFO ORGANIZER. When changing the name in this instance, don't delete the keyword DATA.

There's one other trick to keep in mind. When a program requires several files, you'll often use a basic name for all files and simply add a different ending for each file, to give each a unique name. The complete name must conform to ProDOS restrictions. For example, any of

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the following assignment statements might appear in the program:

```
F$ = N$ + E$
```

```
F$ = N$ + "INDEX"
```

```
F$ = "TAX INFO ORGANIZER DATA"  
+ E$
```

```
F$ = "TAX INFO ORGANIZER DATA  
INDEX"
```

If included as part of the disk-file command, the name might appear as

```
PRINT D$;"OPEN ";N$;" INDEX"
```

To handle these situations, decide what names you'll use, making sure they have 15 or fewer characters. For example, you might name the data file simply "TAX.DATA.87" and use ".IX" (remember, no spaces) for the ending you'll add to the index-file name. "TAX.DATA.87.IX" has 14 characters and no spaces. In the above examples, be sure the program assigns "TAX.DATA.87" to N\$ and ".IX" to E\$.

So much for filenames. Apple DOS has another quirk ProDOS doesn't like. To create a new disk-data file in Applesoft BASIC, you commonly use the DELETE command first to remove any old copies of that file already on disk. But Applesoft crashes with a "file not found" error if there's no file with the specified name on disk in the first place. Applesoft programmers, therefore, use the OPEN command to either open the old file, or to create a file entry on disk if the file isn't already there. Then the DELETE command works—but not in ProDOS.

ProDOS doesn't let you delete an open file. Also, unlike Apple DOS, ProDOS doesn't let you use the OPEN command on a file that's already open. Both situations crash a ProDOS program. Fortunately, the solution is simple. Precede the OPEN command with a line that reads `PRINT CHR$(4);"CLOSE"`, and place an identical CLOSE command between the OPEN and the DELETE.

Now your program makes sure all files are closed before issuing an OPEN command so that it doesn't cause a crash. Your program then issues the OPEN command to ensure that the file appears on disk (so

that the DELETE command doesn't crash), and it CLOSES all files so that the ProDOS DELETE command will work.

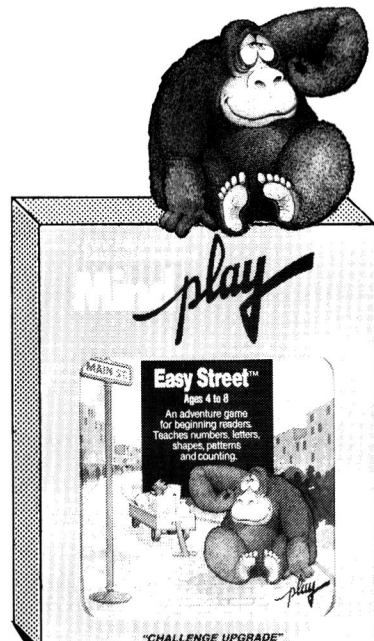
CATCH THE PROGRAMMING BUG

Programming is a rewarding experience. You can achieve a sense of accomplishment even when you type in a program from someone else's listing and debug your work, finally getting the program to operate correctly. But programming often demands great patience and an almost inhuman attention to detail. If you're becoming frustrated with a particularly difficult program, don't give up. With practice, it really does become easier.

Several of you have requested a list of Applesoft Adviser programs that are available on disk for purchase. A particularly good buy is an enhanced version of Calorie Burner (September 1987, p.

99, and October 1987, p. 101). Dr. A. Claremont, Associate Professor of Physical Education at Oregon State University in Corvallis, has built a large database of activities, included on disk with the program, that will help you determine the approximate number of calories you burn per day. If you'd like a copy of this program, send a check for \$9.50 and a disk formatted for Apple DOS or ProDOS. (Indicate which system.) For a list of other available programs with prices, send a self-addressed, stamped envelope. I'll respond within a week of receiving your request. ■

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Electronic Education

by Tom Sherman

After 26 years of teaching elementary-school science, I thought I'd seen it all. Believe me, I was ready to retire," sighed Carl Beckett, a teacher in Auburn, Maine. "But when my fourth-grade class started collaborating with others in on-line projects, their accomplishments astonished me. If this is the future of education, I sure don't want to quit now."

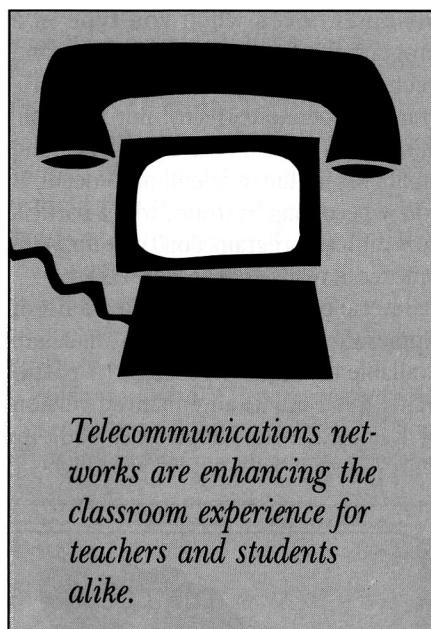
Thousands of teachers and students today share Beckett's excitement about the potential of electronic networks in education.

FOR STUDENTS

All of us remember teachers asking us to solve problems when they already knew the answers. Like practicing scales, these exercises, we were told, would prepare us for the real world in the future. In some important ways, of course, they do, but students—not to mention teachers and parents—are often bored by practice work that has no real consequences. Writing for real audiences and solving real problems can inspire students to do better work.

Suppose that instead of writing an essay just to satisfy the teacher, students collaborate with others around the world to produce a newspaper for international distribution. Or imagine that instead of completing answers in a science workbook, students collect data that might influence national legislation.

As Ken Leupold, a teacher in rural New Mexico, reports, "Telecommunications lets us reach out quickly to other students from across the world and exchange meaningful information from which both sides learn. Students are much more motivated to write and read when it's something real, not just a contrived assignment from a book."



Jan Muller

Harris Thomas, a seventh-grade geography teacher in Juneau, Alaska, points out that "the immediacy of responses helps with class motivation and participation."

Many busy teachers generously answered my on-line request for information with encouraging stories of struggle and success. "My junior-high kids *hate* staying after school to finish an assignment," writes Bill Hay from British Columbia. "Yet there's no problem getting these same 13- to 16-year-olds to come in after school to work on a telecommunications assignment."

Ike Coleman, director of the South Carolina Rural Writing Network Project, describes "kids in an all-white community in the hills of the rural South writing about their area to students in an inner-city New York school. One student on the New York end wrote about a Spanish bodega, and one student in Salem, South Carolina, described a neighbor's old car that now has goats living in it."

NATIONAL GEOGRAPHIC KIDS NETWORK

Don't be surprised if in ten years the **National Geographic Kids Network** has become a landmark in the development of educational telecommunications. Funded by the National Science Foundation and the National Geographic Society, the project is based on the assumption that young students can collaborate in meaningful scientific work. The curriculum, imaginatively developed by Technical Education Research Centers, introduces them to the process of collecting data, trying to understand it, and refining conclusions with data collected by others.

In a pilot project with 200 classrooms in a variety of neighborhoods nationwide, students in grades 4-6 began by collecting information about their birthplaces, their pets, and their recreational activities. Using Apple IIGSs and a modified version of Talk Is Cheap to simplify telecommunication, classrooms sent their data to the project office to be totaled and returned, sometimes in the form of color-coded, computerized maps. Working in clusters of eight geographically distributed classrooms, on the average, students used electronic mail to help explain the data. Would you expect the birthplaces of students in a New York school to be more or less concentrated than those in a midwestern school?

Then students built rain collectors, measured and recorded rainwater acidity, and again sent in their data to not only share them with other students, but also with interested scientists. Related experiments—such as testing the effects of soil and water on plant growth—helped prepare students to talk in class and on line about the social and economic consequences of their environments. Students and teachers (like Carl Beckett) as

well as scientists are enthusiastic about the results, eager for continuing project development with additional schools in the coming academic year.

FREDMAIL

Imagine sending a message or a file to a local BBS and having it automatically transferred overnight to a network of teachers and students on 70 other BBSs around the United States—for free. Running CMS (Computer Mail System) SchoolNet software on Apple IIs in all kinds of schools, **FrEdMail** nodes give teachers an affordable way to distribute materials through a grass-roots network. Connecting to one node, teachers are likely to find notes from other on-line projects, curriculum ideas and student work, together with information about workshops and job opportunities, news about legislation affecting education, and announcements of new nodes on the growing network.

The FrEdMail Network was initiated by Al Rogers, computer specialist for the San Diego County Schools. Rogers had already adapted Paul Lutus' public-domain word-processing program, Free-Writer, for use by teachers as the Free Educational Writer, FrEdWriter. (CMS SchoolNet; FrEdWriter; FrEdSender, a telecommunications program; FrEdBase, a database manager; and other educational software, as well as information about the network, are available from Computer-Using Educators, Inc.) Designed as a means to share student writing, this network and others like it may, in the long run, prove to be more successful than large, centralized systems.

FOR TEACHERS

On-line connections also benefit teachers, introducing new ideas, providing professional development, answering questions about resources, and offering valuable emotional support.

Rural teachers often feel especially isolated, but all teachers can use on-line connections for software reviews, technical support, curriculum ideas, and public-domain programs. Frank Odasz, from

the **Big Sky Telegraph** bulletin-board system, reminds us that "location is irrelevant to the availability of on-line information. Developing a means of sharing available human resources and expertise among our communities is an excellent way to start stimulating new opportunities. As more of our local experts and resource persons make it on line, more of our accumulated knowledge and expertise will be available to all. The corner coffee shop has its limits as a communications medium."

Many teachers suffer professional isolation in their classrooms. As Margaret Riel, a research psychologist, points out, "Many teachers are isolated from others who share their particular educational interests or expertise." Now helping to develop the **AT&T Long Distance Learning Network**, Riel points out that electronic networks publicize informally what teachers do well, giving them credit for accomplishments otherwise unrecognized.

Personal support on line can be a "life line," as more than one teacher has called it, in a storm of doubts and dissatisfaction. Teachers, from the beginner to the burned-out, need recognition from a "community of colleagues" who understand their problems, according to Griff Wigley, editor of the **McGraw-Hill Information Exchange** (see below).

As one teacher wrote to colleagues on **BreadNet** (see below), "We need to know we're not the only English teachers in the world going bonkers because we're doing 25 different things and only three seem to be going well at this time." Adds Wigley, "Supportive exchanges help create an environment that encourages teachers to see new possibilities and accept new challenges."

BREADNET

Every summer at Middlebury College's Bread Loaf School, English teachers in the graduate program work on new ways to help students write well. Returning to their classrooms, more than 40 teachers continue their effort on line through BreadNet, a cluster of private conferences set up on the **UNISON** information service.

Like other networks, BreadNet supports professional development and facilitates the exchange of student work—between a private school in Pittsburgh and an Oglala Lakota reservation in South Dakota, for example. The focus here on the teaching of writing, however, makes these on-line conferences an especially rich source of ideas and creative strategies.

You can get a good idea of the results (and the skill of BreadNet teachers) from Tracy Winn's account of an incident in her Watertown, Massachusetts, first- and second-grade classroom:

A child who has difficulty trusting letters and her ability to trap them with a pencil on paper refused to come when it was time for snack. She said, "I can't come right now. I'm writing." I said, "It's great that you're so involved in what you're doing, but right now Megan is passing out pretzels and you're going to miss it." She didn't look up, but in a dreamy sort of voice asked, "Would it be all right if I went hungry this morning? I really want to write." She concentrated for more than an hour on her story.

MIX

The McGraw-Hill Information Exchange (MIX), a service exclusively for students and teachers, may remind you of an energetic national conference. Several organizations—the International Technology Education Association, for example, and the National Business Education Association—are doing business in both public and private areas. Some 2000 educators are talking in small groups with each other and with resource specialists about curricula, classroom issues, and computers.

From classrooms here and abroad, students are involved in an enormous variety of activities—collaborating on newsletters, defining the ideal school, corresponding with senior citizens, comparing the results of science experiments, simulating international negotiations. Some of the student exchanges are entertaining: "Which food is the most hazardous in your cafeteria?" Many reveal the pleasure and surprise of real learning: "The contrast between the old and new technology seemed an exciting idea

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Escape

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

Il cue #62

To print a range of pages from the AppleWorks word processor, move the cursor onto the last page you want to print and enter open-apple-Options), PE (pause each page). Next open-apple-K(alculate) and move the cursor to the first page you want to print. Finally, print from 'this page'. When AppleWorks pauses, press Escape. This will print only the range of pages you have selected. For more, see 'Printing revisions' in the June 1988 **Open-Apple**, page 4.38.



From our fan mail:

No fair, no fair, no fair. I recently purchased all of the back issues of **Open-Apple**. I hope you realize that you put far too much technical information into your publication. I am afraid I may overdose on some of the best tips and tricks I have read in years. Yours is the first publication that I am reading line by line, word by word. I thought I could merely skim through the issues. No way. There is simply too much good stuff to read.

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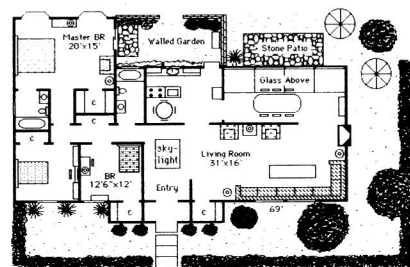
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and we decided to do some research," report sixth-graders from North Whittier Andrews Elementary in California.

MIX has created a nifty Apple II simulation disk, so that teachers can see in advance how the system works, and a brief *Telecommunications Planning Guide for Educators*. Unlike systems that bill by the hour, MIX is available for an annual fee, plus blocks of time paid in advance.

PROBLEMS

Thoughtful pioneers in educational telecommunication recognize both theoretical and practical problems in using the technology. Craig Blurton, an on-line MIX conference guest, asked, "Is the technology driving curriculum or vice versa?"

As a professor at California State University, Blurton is one of several educators concerned about the relationship between the educational content and the technological conduit. There seems to be growing agreement that simply speeding

up traditional activities—pen-pal letters, for example—is less productive than group work on line.

According to Dennis Harkins, an education-technology specialist and FrEd-Mail Network sysop in Ambler, Pennsylvania, "Teachers' major problems getting involved in telecommunication are lack of time and equipment." Many school librarians and some classroom teachers have computers connected by modem to telephone lines in their rooms, but administrators are sometimes reluctant to invest in the equipment and connect costs.

Even the most enthusiastic teachers can find their initial efforts frustrating, and, as in other areas of computerization, it's common to underestimate the time and tribulation of installing and learning to use new equipment and software. Fortunately, today's Apple II telecommunication programs and information services are making on-line navigation easier for novices.

FINAL GRADE

We hear a lot these days about what's wrong with our educational system. Against that dark background, it's encouraging to all of us to learn about the illuminating experience of teachers and students on line. Reflecting on what he'd learned from exchanges with peers in a different community, one student wrote, "Something that's strong in my mind is a kind of respect and understanding we've built with other students through writing." ■

Tom Sherman is a communications consultant specializing in computer-related activities. Write to him at 224 South Chester Road, Swarthmore, PA 19081, or contact him on line through GENIE (SHERMAN), CompuServe (72010,12), The Source (CPA177), Delphi (Sherm), The WELL (sherman), PeaceNet (tsberman), and PARTI on NWI, Unison, and The Source (Tom Sherman). He's especially interested in hearing about off-beat BBSs for an upcoming column.

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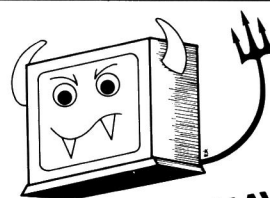
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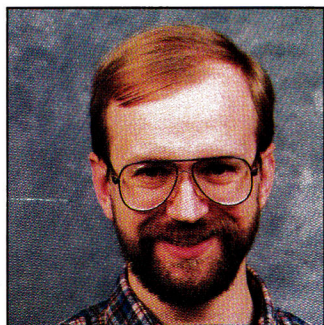
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by Scott Mace

"The best graphics are in the mind of the beholder."



Keeping up with changing times: Infocom's added a graphics interface, windows, and on-screen mapping to a superb text adventure to produce Beyond Zork.

Screen Adventure: Graphics vs. Text

Are bad graphics screens better than no graphics at all? Some companies seem to think so—with less-than-stellar results. Two recent releases from Mindscape and Electronic Arts offer examples of what *not* to do in game design. In contrast, Infocom's latest text adventure is one of the most innovative, enthralling games published this year.

STAY AWAY

Let's begin at the bottom. I usually leave bad games to rot and molder, but this time I want to warn you about **Gauntlet** for the Apple II, from Mindscape (3444 Dundee Road, Northbrook, IL 60062, 312-480-7667, IIe/c \$39.95, GS \$44.95).

The GS version is barely playable—even the IBM PC edition has better graphics and faster animation. Don't blame the computer; someone obviously chose to ignore the GS' graphics power. The IIe/IIc version is even worse. If

you're used to the arcade version of Gauntlet, you're in for a rude surprise.

POST-NUCLEAR DOCS

Then there's **Wasteland** from Electronic Arts (1820 Gateway Drive, San Mateo, CA 94404, 415-571-7171, \$49.95), a fair-to-middling product. In yet another attempt to foil software pirates, Wasteland's creators came up with a game that stops you periodically and instructs you to read the manual. This move is totally counterproductive. Software evolution is supposed to entail getting away from manuals.

The plot sets you roaming the deserts of the U.S. Southwest sometime after a nuclear holocaust; instead of swords and spells, you're armed with pistols, rockets, submachine guns, and laser weapons. It describes the demise of certain monsters quite graphically—pools of blood everywhere, and so on.

Once you're through saying, "Yuk," you'll realize the whole thing is pretty silly. This game panders to someone's idea that all teenagers care about is blood 'n' guts Rambo. Let's give game players more credit.

You'll find a lot of loopholes. For instance, you can attack the Guardian Citadel repeatedly and amass a huge number of "power packs," after which you're nearly unbeatable. Novices will love such tricks; experts will moan and groan at these obviously unintended shortcuts.

Wasteland's a mixed bag; its innovations lie not in plot or execution, but in the cracks and crevices of the game instead. For example, you can clone any character, including your own, many times. In addition, you can split up your party and conduct separate investigations of the landscape.

Despite the blood and gore, Wasteland has one socially responsible theme. To advance your skill level, you have to visit

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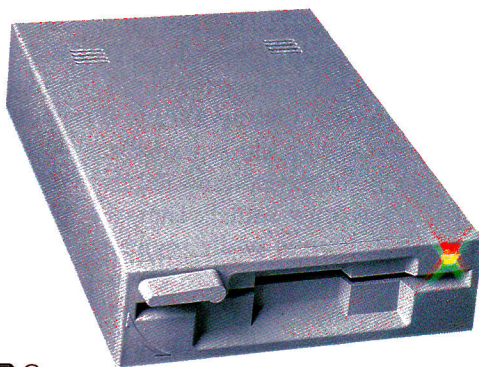
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Electronic Arts' futuristic Wasteland: Visits to local libraries mesh with blood 'n' guts as you roam the deserts of the Southwest.

the few libraries remaining in the devastated Southwest. Game designers should include such developments more often—higher standards of plot design might inspire a little more love for learning.

BOLD NEW ZORK

Games like Gauntlet just lend more fuel to Infocom's argument that the best graphics are in the mind of the beholder.

But Infocom (125 Cambridge Park Drive, Cambridge, MA 02140, 617-492-6000) also realizes that text adventures in their current form have now captured a certain percentage of the population and will go no further, as command-driven operating systems give way to graphics interfaces such as the GS Desktop.

And don't forget the competition—the "Ultima syndrome," where formerly simplistic graphics adventures such as Origin Systems' are acquiring more interactive text capabilities through better disk-storage techniques.

So Infocom is changing with the times, adding windows, graphics interfaces, even on-screen mapping. All these de-

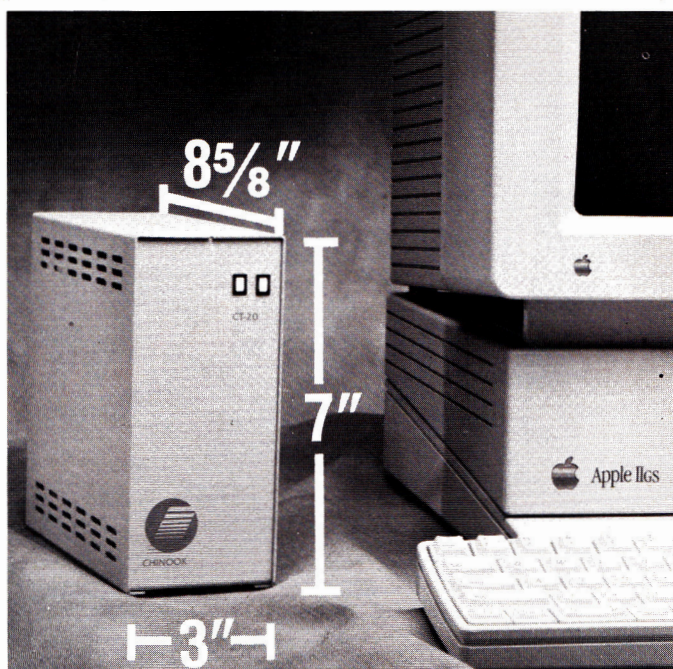
velopments are sure to delight the traditional Infocom fan and entice those of you who have avoided text adventures into giving them a second look.

The first game to employ this redesigned look is suitably titled **Beyond Zork: Coconut of Quendor** (\$49.95). It's no sequel, but rather a brand-new adventure.

Brian Moriarty, creator of Beyond Zork, tells an amusing story. The goal of your quest is to wrest the coconut from the Implementors, a race of bush-league gods who toy with your fate. A variety of monsters—the Discipline Crab, the Monkey Grinder, the dreaded Grue—and weapons keep things rolling. Even the lowly onion repels some monsters.

Beyond Zork makes other games seem inarticulate. You'll have a blast. ■

Scott Mace is editor and publisher of Microcosm, a monthly newsletter on computer games. Write to him at 6510 Copper Ridge Drive, # T-1, Baltimore, MD 21209. Enclose a self-addressed, stamped envelope if you'd like a personal reply.



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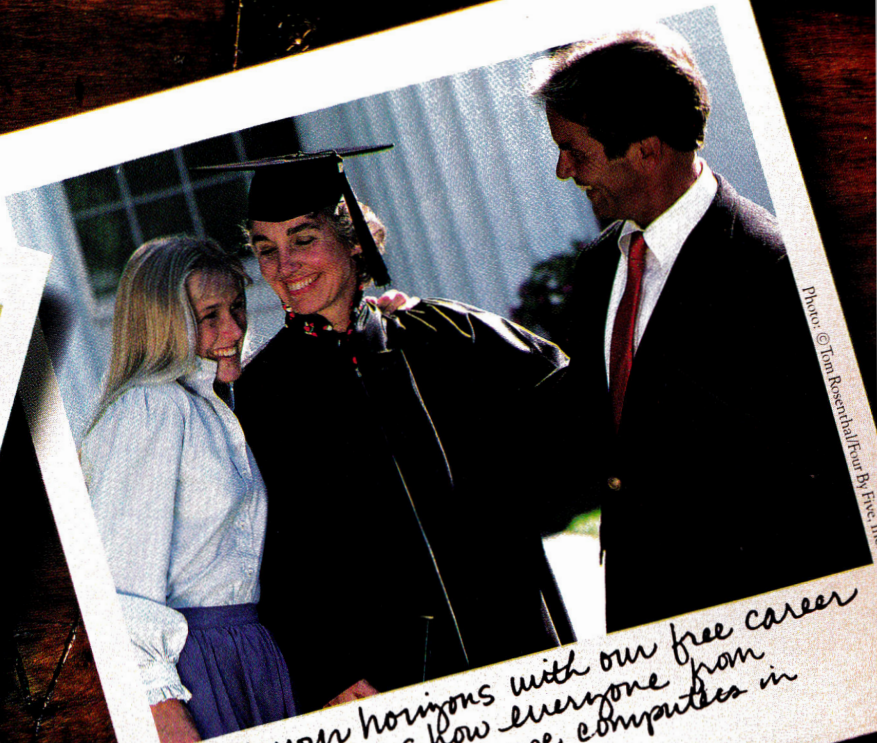


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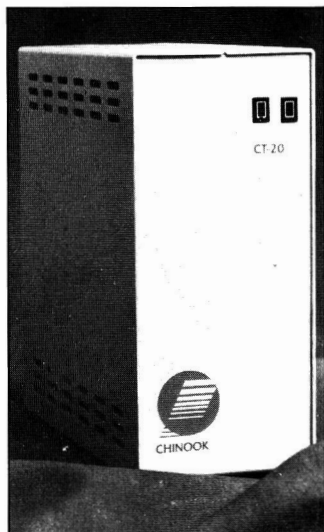
NEW PRODUCTS

edited by Pat Payne

Hardware

DRIVE AWAY

Chinook Technology's new **CT-20 20-megabyte hard disk** is designed specifically for the Apple II family. The drive comes with SCSI controller card, cables, and operating and utility software. The company formats all drives with ProDOS before shipment. The CT-20 is available for \$650 from Chinook Technology, 601 Main Street, #635, Longmont, CO 80501, (303) 678-5544 or (800) 727-5544. For more information, circle Reader Service number 351.



Chinook's new CT-20 20-megabyte hard disk comes with SCSI controller card, cables, ProDOS formatting, and operating and utility software.

MAKING MUSIC

Audio Animator and Sonic Blaster, two new **music boards** from Applied Engineering, are designed especially for the IIGS. You can connect Audio Animator to any MIDI device; it lets you edit previously recorded melodies and play them back on any MIDI-compatible instrument. Animator requires at least 1 megabyte of memory.

Sonic Blaster, which requires 512K, isn't used in conjunction with MIDI devices: It's a stereo digitizer that records and edits sounds. You can use both boards with popular music programs, including Music Studio, Music Construction Set, and Diversi-Tune. Audio Animator is available for \$239 and Sonic Blaster for \$129 from Applied Engineering, P.O. Box 5100, Carrollton, TX 75011, (214) 241-6060. Circle Reader Service number 352 for more information.

MODEM MADNESS

CommLink 2400, a **2400-baud modem** for the Apple II family of computers, comes in a platinum case designed to blend in with the Apple product line. It features Hayes compatibility, including AT command sets and Hayes S registers, as well as digital signal processing and automatic adaptive equalization, both of which help ensure error-free transmission. CommLink 2400 is available for \$219.95 from MDIdeas, 1163 Triton Drive, Foster City, CA 94404, (415)

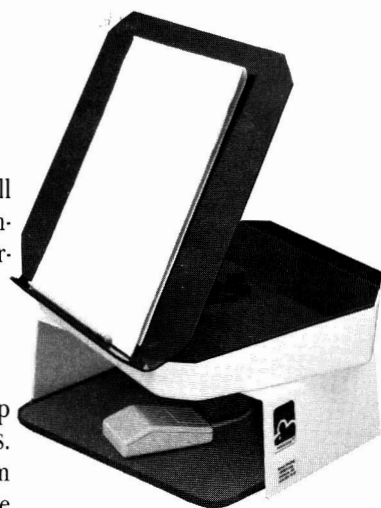
573-0580. For orders only, call (800) 843-5722. For more information, circle Reader Service number 353.

SPEED DEMON

TransWarp GS will speed up the work you do on your IIGS. This new **accelerator card** from Applied Engineering ups the processor speed from the standard 2.8 megahertz to approximately 6 megahertz, nearly doubling the speed of CPU-dependent operations. (The board doesn't affect operations such as printing and writing to disk.) It's available for \$299 from Applied Engineering, P.O. Box 5100, Carrollton, TX 75011, (214) 241-6060. Circle Reader Service number 354 for more information.

FASTER THAN EVER

RocketChip from Bits & Pieces Technology is a new **accelerator chip** for 8-bit members of the Apple II family. It works with the II Plus, IIC, and IIE, bringing their operating speed up to 5 megahertz; you can toggle between the standard speed of 1 megahertz and the accelerated rate. RocketChip is available through authorized dealers for \$189. For more information, contact Gantry Enterprises, distributors of RocketChip, at P.O. Box 2622, San Rafael, CA 94912, (415) 472-0922, or circle Reader Service number 355.



Gered Corporation's Mousetrap helps you find your mouse amid the clutter on your desk.

TRAPPED!

A new **desk organizer** called the Mousetrap creates more usable space in your work area. It also helps you keep track of your mouse—in an enclosed yet accessible area so that it won't get buried under papers, books, and disks. The Mousetrap also features a storage area and a swivel stand. It's available for \$39.95 (plus \$4 shipping) from Gered Corporation, 2401 Northeast Cornell Road, Suite 125, Hillsboro, OR 97124, (800) 852-TRAP. Circle Reader Service number 350 for more information.

Software

TEACHER'S PET

The Character Factory, a new software package from Seven Hills Software, can **print characters** not shown on the Apple keyboard, including those used in mathematics, science, and foreign languages. It's compatible with any ProDOS or DOS 3.3 program that

Wordbench gets you organized before you write, then helps you put together a coherent document.

lets you enter control codes, including AppleWorks and Apple Writer. The program also requires a printer that permits downloaded characters.

The Character Factory is available for \$24.95, or \$49.90 for unlimited copies per school or college department, from Seven Hills Software Corporation. For more information, contact the company at 2310 Oxford Road, Tallahassee, FL 32304, (904) 576-9415, or circle Reader Service number 358.

NEW DIRECTION

Art & Film Director combines features of **paint and animation** programs in one package. Using cell animation, it lets you transform your drawings into realistic cartoons. You can even show off your work on your monitor (via a floppy disk) or television screen (via a VCR).

Art & Film Director is available from Epyx, 600 Galveston Drive, Redwood City, CA 94063, (415) 368-3200, for \$79.95. For more information, circle Reader Service number 359.

FINDING FEET

Footing to Finish will help you **estimate the materials** you'll need for that addition or new garage you've been considering. The program is designed to assist you in planning such projects—it will help you come up with a breakdown of the materials you need and how much they'll cost. Footing to Finish is available for \$89 from C.O.R.P./Gardé, 8 Bishop Lane, Madi-

son, CT 06443, (203) 245-9089. Circle Reader Service number 357 for more information.

TOOLS OF THE TRADE

Wordbench is a new **word processor** designed for people who need help organizing their thoughts and words for business or personal projects. The program is divided into six components—Outliner, Notetaker, Writer, Print Manager, Folder Manager, and Add-In Manager. The first two modules are linked so that you can assign notes to any place in your outline at any time. The program then merges them to create your first draft.

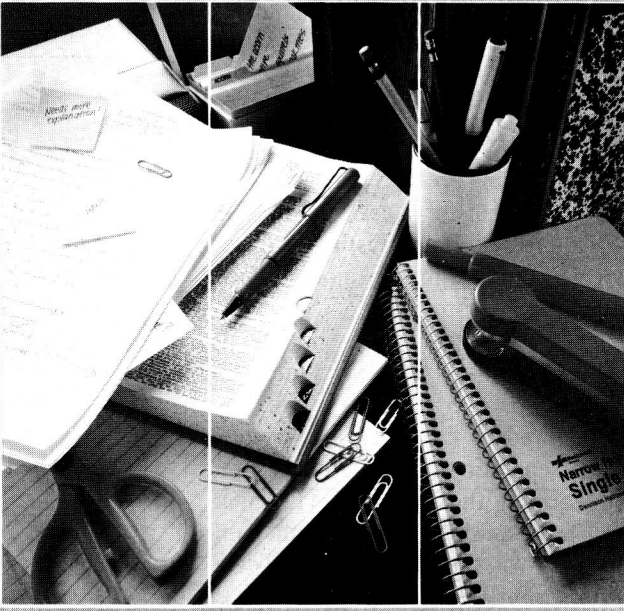
Other features include Brainstormer (part of the Add-In Manager), which provides various exercises to help you find the right focus for your document. Viewer lets you look at and work with two documents or two parts of a document at once. A spell checker, thesaurus, and word-search function are also available.

Wordbench is available for \$149 from Addison-Wesley Publishing Company, 6 Jacob Way, Reading, MA 01867, (617) 944-3700. For more information, circle Reader Service number 356.

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

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Product Updates

- Accolade has created a new product line called **All-Time Favorites**, which includes Hardball! and Ace of Aces. Programs in the new grouping will cost \$14.95 each. For more information, contact Accolade, Inc., 20813 Stevens Creek Boulevard, Cupertino, CA 95014, (408) 446-5757.
- AV Systems is recalling all copies of its **Apple Grader** program purchased between September 1, 1987, and January 1, 1988. For more information, contact the company at 1445 Estrella Drive, Santa Barbara, CA 93110, (805) 569-1618.
- Electronic Arts is now distributing all of **Strategic Simulations'** products. For more information, contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171.
- Edmark Corporation has bought Personal Touch's **TouchWindow** product line and will be responsible for its sales and distribution. For more information about TouchWindows, contact Edmark Corporation, P.O. Box 3903, Bellevue, WA 98009-9990, (206) 746-3900 or (800) 426-0856.
- Scholastic Software has extended the warranty on 100 of its educational-software titles. Under the **new warranty**, Scholastic will replace defective or damaged disks at no charge for 90 days after purchase and for \$10 thereafter. For more information, contact Inquiry Department, Scholastic Inc., P.O. Box 7501, Jefferson City, MO 65102, (800) 325-6149, (800) 392-2179 (MO).

ProDOS Dater

by Martin Lavoie

Date-stamping ProDOS files has always been a problem for clockless Apple II owners. ProDOS Dater (**Listing 1**) makes POKEing the date into memory a quick and convenient procedure.

The routine located at the end of **Listing 1** transforms all NUM date information you enter into a single ALPHANUM value, stored in the DAHTE\$ variable. (The H separating the A and the T prevents forming the command AT, which would cause an error.) The program then POKEs the routine into the ProDOS date memory locations.

You can use the program and the variable DAHTE\$ in your own programs, with the PDOS CHAIN command. To do this, change line 13110 to the following:
13110 PRINT : PRINT CHR\$(4)"CHAIN
program.name"

Apple ProDOS stores the date and time in the four memory locations shown in **Table 1**.

Table 1. Memory locations.

49040	DAY/MONTH
49041	YEAR
49042	MINUTES
49043	HOURS

To set the time, use 24-hour format to simply POKE the minutes into location 49042 and the hours into location 49043. POKEing the date, however, is more complicated, and this is where ProDOS Dater proves beneficial.

Apple splits the year in half, because you can't POKE values greater than 255 (365 days in a year). The first half includes months 1-7 (January through July).

POKE 33 for January 1, and 255 for July 31. Note in **Table 2** that the first of

Listing 1. ProDOS Dater.

```

10 REM PRODOS DATER [1091]
20 REM BY M. LAVOIE [1020]
30 REM COPYRIGHT 1988, INCIDER [1773]
12000 PRINT : PRINT CHR$(4)"PR#3" [1380]
12001 PRINT : PRINT : HOME : VTAB 8 [1186]
12010 PRINT "Enter today's date:" [2279]
12020 VTAB 10 [549]
12025 ONERR GOTO 12020 [876]
12026 X = 0:Y = 0:M = 0:D = 0 [1816]
12030 PRINT : VTAB 9: HTAB 1: HTAB 1: PRINT " MM DD
YY" [2249]
12031 VTAB 10: PRINT "-> _ -19 /" [1792]
12032 VTAB 10: HTAB 3: GET M1: PRINT M1 [1309]
12033 VTAB 10: HTAB 4: GET M2: PRINT M2 [1313]
12034 M = (M1 * 10) + M2:M1 = 0:M2 = 0 [2048]
12035 IF M < 1 OR M > 12 THEN 12030 [1589]
12040 VTAB 10: HTAB 6: GET D1: PRINT D1 [1302]
12041 VTAB 10: HTAB 7: GET D2: PRINT D2 [1306]
12042 D = (D1 * 10) + D2:D1 = 0:D2 = 0 [2011]
12043 IF D < 1 OR D > 31 THEN 12040 [1581]
12050 VTAB 10: HTAB 11: GET Y1: PRINT Y1 [1398]
12051 VTAB 10: HTAB 12: GET Y2: PRINT Y2 [1402]
12052 Y = (Y1 * 10) + Y2:Y1 = 0:Y2 = 0 [2126]
12053 YE = Y [523]
12055 IF Y < 87 OR Y > 95 THEN 12050 [1708]
12060 IF M > 7 THEN 12500 [1031]
12070 IF M = 1 AND D > 30 THEN 12400 [1614]
12075 IF M = 4 AND D > 30 THEN 12400 [1622]
12080 IF M = 2 AND D > 29 THEN 12400 [1633]
12090 Y = Y * 2 [743]
12100 X = (M * 32) + D [1140]
12110 POKE 49040,X [699]
12120 POKE 49041,Y [711]
12130 REM [323]
12140 REM [333]
12150 GOTO 13000 [580]
12400 PRINT : PRINT "Improper date,hit [RETURN]" [3015]
12405 K = 0:K = PEEK (49168): IF K < > 141 THEN 1240
5 [2732]
12410 GOTO 12140 [589]
12500 IF M = 8 AND D > 31 THEN 12400 [1797]
12510 IF M = 9 AND D > 30 THEN 12400 [1807]
12511 IF M = 10 AND D > 30 THEN 12400 [1848]
12512 IF M = 11 AND D > 30 THEN 12400 [1850]
12520 IF M = 8 THEN X = D:DAHTE$ = "AUG-": GOTO 12600
[2826]
12530 IF M = 9 THEN X = 32 + D:DAHTE$ = "SEP-": GOTO
12600 [3149]
12540 IF M = 10 THEN X = 64 + D:DAHTE$ = "OCT-": GOTO
12600 [3202]
12550 IF M = 11 THEN X = 96 + D:DAHTE$ = "NOV-": GOTO
12600 [2976]
12560 IF M = 12 THEN X = 128 + D:DAHTE$ = "DEC-": GOTO
12600 [2992]
12570 GOTO 12400 [493]
12600 Y = (Y * 2) + 1 [1073]
12610 POKE 49040,X [689]
12620 POKE 49041,Y [701]
12630 GOTO 12130 [553]

```

Continued

Listing continued.

```

13000 IF M = 1 THEN DAHTES = "JAN-" [1885]
13010 IF M = 2 THEN DAHTES = "FEB-" [1884]
13020 IF M = 3 THEN DAHTES = "MAR-" [1914]
13030 IF M = 4 THEN DAHTES = "APL-" [1922]
13040 IF M = 5 THEN DAHTES = "MAY-" [1943]
13050 IF M = 6 THEN DAHTES = "JUN-" [1960]
13060 IF M = 7 THEN DAHTES = "JUL-" [1714]
13070 Y$ = STR$ (YE) [865]
13080 D$ = STR$ (D) [764]
13090 DAHTES = DAHTES + (D$ + "-" ) [1779]
13100 DAHTES = DAHTES + Y$ [1416]
13110 END : REM OR PRINT : PRINT CHR$ (4) "CHAIN pro
gram" [3311]

```

End

Table 2. POKEing locations for the date.

FIRST HALF								SECOND HALF					
DAY	JAN	FEB	MAR	APL	MAY	JUN	JUL	DAY	AUG	SEP	OCT	NOV	DEC
===	===	===	===	===	===	===	===	===	===	===	===	===	===
1	33	65	97	129	161	193	225	1	1	33	65	97	129
2	34	66	98	130	162	194	226	2	2	34	66	98	130
3	35	67	99	131	163	195	227	3	3	35	67	99	131
4	36	68	100	132	164	196	228	4	4	36	68	100	132
5	37	69	101	133	165	197	229	5	5	37	69	101	133
6	38	70	102	134	166	198	230	6	6	38	70	102	134
7	39	71	103	135	167	199	231	7	7	39	71	103	135
8	40	72	104	136	168	200	232	8	8	40	72	104	136
9	41	73	105	137	169	201	233	9	9	41	73	105	137
10	42	74	106	138	170	202	234	10	10	42	74	106	138
11	43	75	107	139	171	203	235	11	11	43	75	107	139
12	44	76	108	140	172	204	236	12	12	44	76	108	140
13	45	77	109	141	173	205	237	13	13	45	77	109	141
14	46	78	110	142	174	206	238	14	14	46	78	110	142
15	47	79	111	143	175	207	239	15	15	47	79	111	143
16	48	80	112	144	176	208	240	16	16	48	80	112	144
17	49	81	113	145	177	209	241	17	17	49	81	113	145
18	50	82	114	146	178	210	242	18	18	50	82	114	146
19	51	83	115	147	179	211	243	19	19	51	83	115	147
20	52	84	116	148	180	212	244	20	20	52	84	116	148
21	53	85	117	149	181	213	245	21	21	53	85	117	149
22	54	86	118	150	182	214	246	22	22	54	86	118	150
23	55	87	119	151	183	215	247	23	23	55	87	119	151
24	56	88	120	152	184	216	248	24	24	56	88	120	152
25	57	89	121	153	185	217	249	25	25	57	89	121	153
26	58	90	122	154	186	218	250	26	26	58	90	122	154
27	59	91	123	155	187	219	251	27	27	59	91	123	155
28	60	92	124	156	188	220	252	28	28	60	92	124	156
29	61	*93	125	157	189	221	253	29	29	61	93	125	157
30	62	---	126	158	190	222	254	30	---	62	94	126	158
31	---	---	127	---	191	223	255	31	---	---	---	---	159

*- Only on leap year

each month is greater than the first day of the preceding month, resulting from the system skipping one "day" between months, plus the phantom 31st day of those months with only 30 days. To POKE the year into these first seven months, double the year value, then POKE it into the 49041 location.

POKEing months 8-12 (August through December) requires the same process—

skipping one "day" between months, and so on. August 1st will be 1, not 32, as was the case with January 1st. So from August 1 to December 31, POKE 1 through 159. To obtain the year, double the value and add 1, to tell the system you're in the second half of the year. That means if the year is 87, the value you have to POKE is 175.

If you don't have a clock card, you don't need to POKE the time, because the system

won't change the minutes and the hours during the day. Instead you'll have to change the time every 60 seconds if you want to track new versions of the file.■

Write to Martin Lavoie at P.O. Box 383, Montreal-Nord, Quebec H1H 5L4, Canada.

GS Sound Update

Ultima V fans who've been running the game on their Apple IIgs may have already discovered that the software can't use third-party music boards on that machine. Origin Systems, publisher of Ultima V, has found a way around the problem, however.

Listing 2. Assembly-language patch lets Ultima V access music boards on the GS.

```

00300: 18      29   cld      ;go to 65816 Native Mode
00301: FB      30   xcd
00302: C2 30   31   rep     #530 ;set register widths to 16 bits
00304: F4 0B 00 32   pea    $000B ;set up to disable ADB interrupts
00307: A2 03 23 33   ldx     #52303 ;and call tool $2303 (IntSource)
0030A: 22 00 00 E1 34   jal     $e10000
0030E: F4 04 00 35   pea    $0004
00311: F4 00 03 36   pea    $0000 ;point Interrupt Manager vector
00314: F4 00 03 37   pea    $0300 ;to Ultima V music handler at $300
00317: A2 03 10 38   ldx     #51003
0031A: 22 00 00 E1 39   jal     $e10000 ;call tool $1003 (SetVector)
0031E: 38      40   sec
0031F: FB      41   xcd
00320: E2 30   42   sep     #530 ;back to emulation mode & 8-bit regs
00322: 60      43   rts

```

end Merlin-16 assembly, 35 bytes, errors: 0, symbol table: \$1800-\$1801

Listing 3. BASIC code installs Ultima V GS music patch.

```

10 REM      Ultima V Music Patch for Apple IIgs
20 FOR I = 768 TO 802: READ A: POKE I, A: NEXT: CALL 768
30 DATA 24,251,194,48,244,11,0,162,3,35,34,0,0,225,244,4,0
40 DATA 244,0,0,244,0,3,162,3,16,34,0,0,225,56,251,226,48,96

```

Listing 2 shows an assembly-language patch that alters the GS' interrupt handling in auxiliary RAM, letting gamers get full enjoyment from Ultima V via the Mockingboard, Phasor, or Passport MIDI sound card. Type in and save Listing 3, a BASIC program that installs the assembly-language patch. RUN Listing 3, then type PR#6 to boot Ultima V. (Cold booting with Control-Open apple-Reset deactivates the patch.)■

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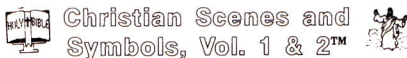
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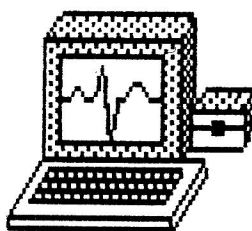
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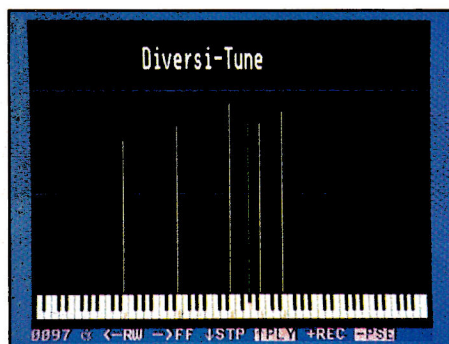
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Diversi-Tune: Play It Again, Apple



Where's that music coming from? Do you guys have a stereo in there?" That's the sort of comment we keep hearing from passers-by when Diversified Software's GS music program **Diversi-Tune**'s cranking out the blues in the *inCider* editorial offices. That refrain of comments is well warranted—Diversi-Tune makes your GS sound like a compact-disc player.

Listening to music with **Diversi-Tune** is just like using a tape player. The program disk comes with a selection of prerecorded music; in addition, Diversified Software will soon offer disks of American folk songs, Christmas carols, Hebrew folk songs, gospel music, and jazz improvisations by Nathan Page, recorded live at May AppleFest in Boston, where **Diversi-Tune** was introduced. Press the open-apple key along with other keys to operate play, stop, rewind, fast-forward, and pause "buttons." With a MIDI-capable instrument, you can also record your own songs and add them to **Diversi-Tune**.

While your song is rolling, you can see any accompanying lyrics in large or small text with a bouncing-ball cue. A keyboard-fingering diagram shows which notes are playing, how forcefully, how long they're sustained, and whether they represent black or white piano keys. There's even a scrolling screen graphic of an old-fashioned player-piano roll, along with a listing of the source code generating the music.

"**Diversi-Tune** is truly for every music lover," notes Review Editor Lafe Low. "You can record up to 32 tracks, and it's digital quality, so serious users will like it. Technical types can watch the tune scroll by as raw MIDI data and get all jazzed by the hex code. Teachers will like the keyboard diagrams showing proper finger placement. Everyone can have fun with it."

Diversi-Tune evoked a wave of nostalgia in Technical Editor Bill Kennedy. "It reminds me of the old days of Apple II software," he reminisced. "It isn't always pretty, but it's got the right stuff."

Diversi-Tune sells for \$55 (a demo disk is \$2) directly from Diversified Software Research, 34880 Bunker Hill, Farmington, MI 48331, (800) 835-2246, (312) 553-9460. This one's definitely worth noting. ■

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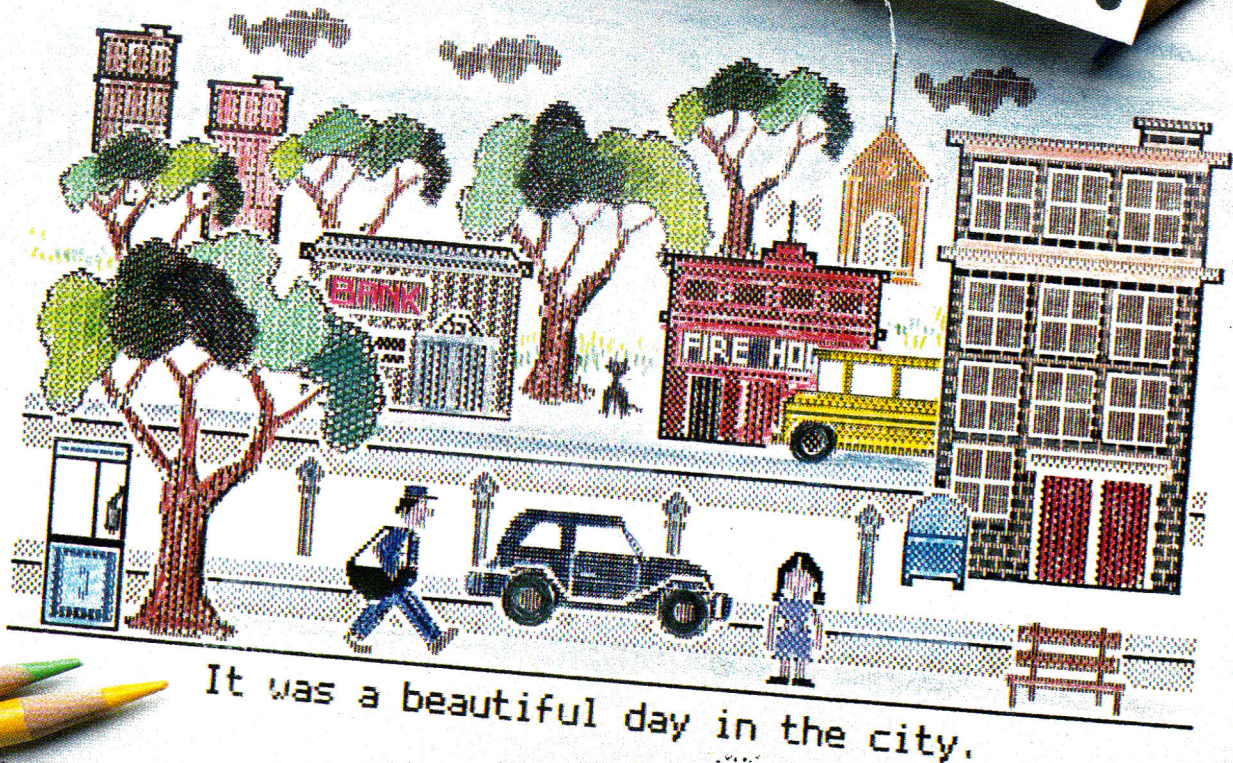
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