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The #1 Apple II Magazine

AUGUST 1988
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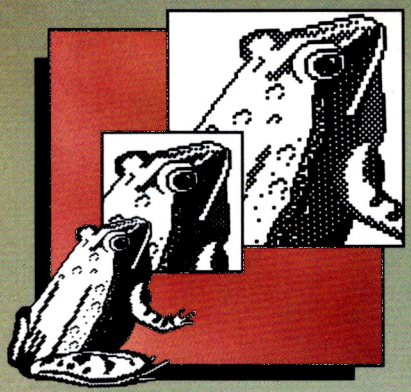

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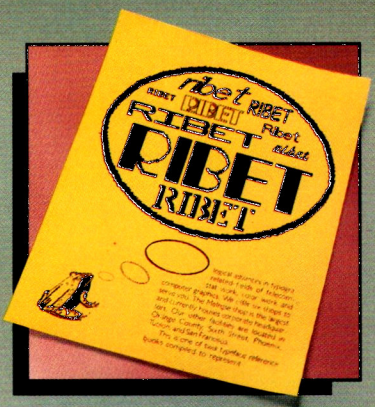

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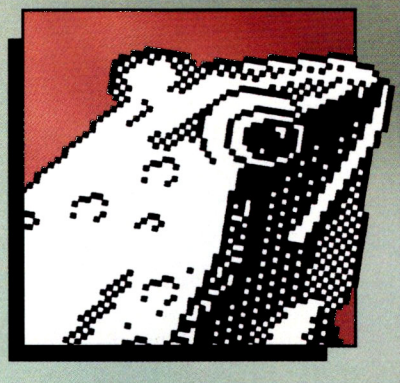

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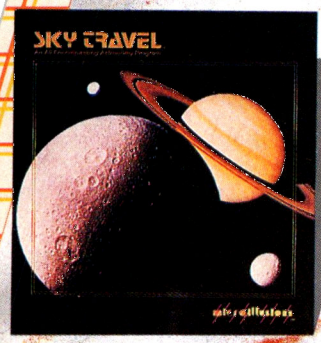

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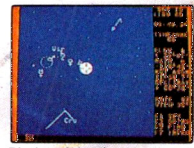

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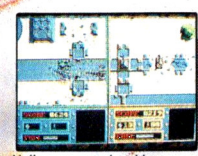

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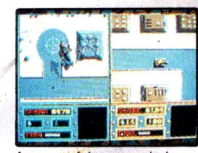

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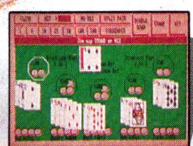
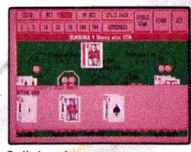


Game in play



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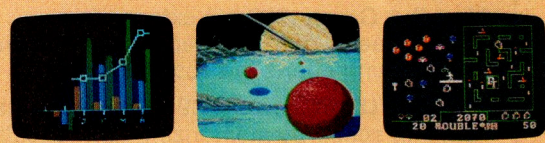

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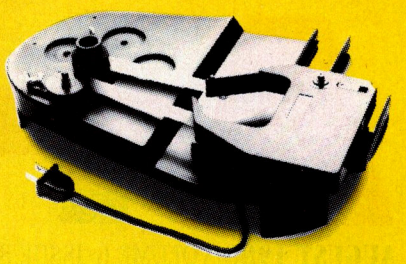

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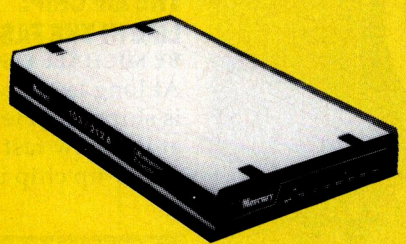

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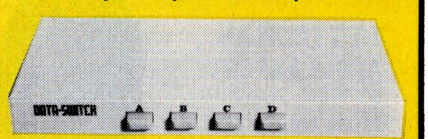

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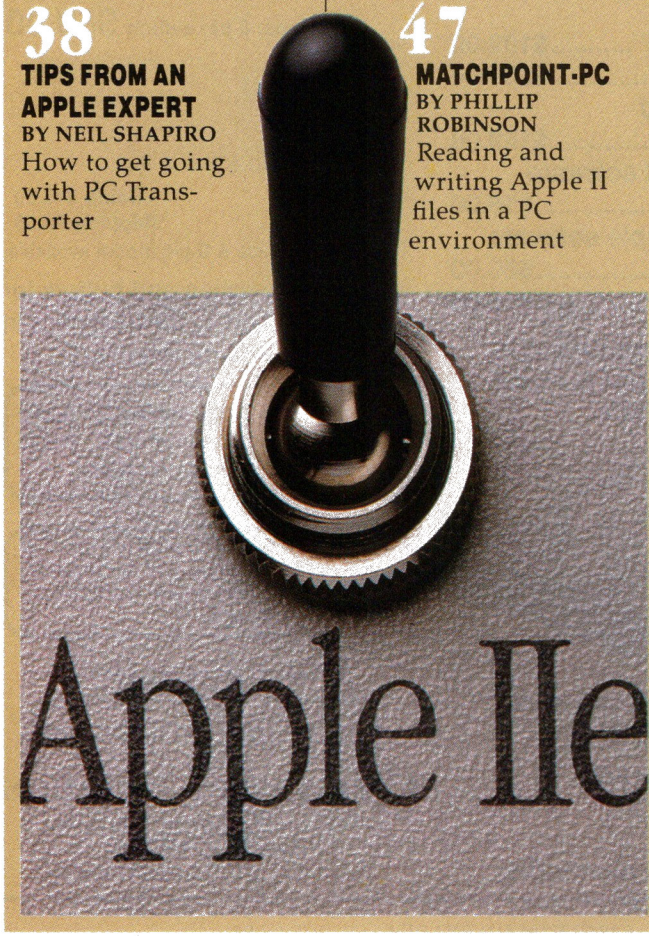

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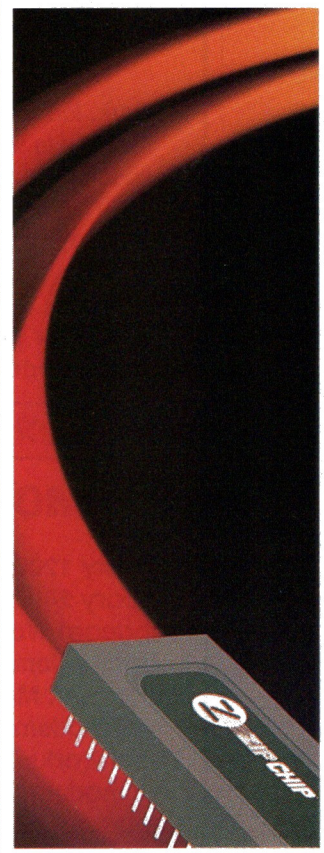

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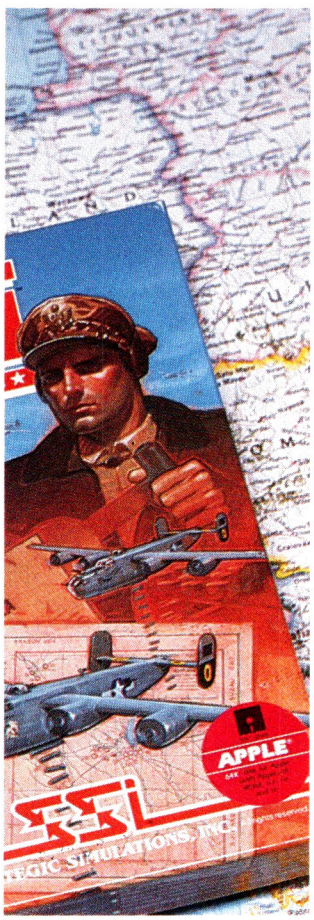

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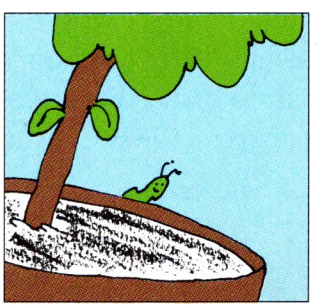

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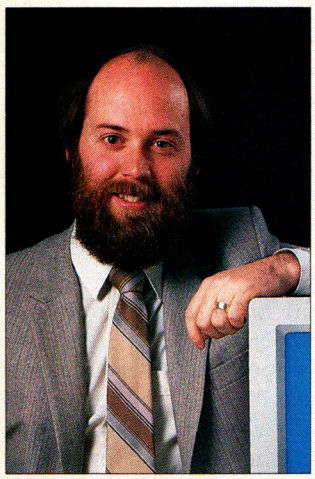

EDITOR'S PAGE

CHAMELEON COMPUTERS

I have owned an Apple II for ten years, an IBM PC for six, and a Macintosh for three. This complete set of the three most popular microcomputers of all time gives me the luxury of being able to run 99% of the best software titles available. It also means I can exchange files with most other computer users; it doesn't matter whether their disks are formatted for ProDOS, MS-DOS, or the Macintosh operating system.

I am sure most of you would opt for a similar computer setup if only you had a few more dollars in the bank and a room commodious enough to accommodate three system units, three keyboards, three monitors, six disk drives, and various peripherals (and, of course, the patience to learn three quite different operating environments). Isn't it a shame you can't buy a compact three-in-one computer with just one set of peripherals? Ideally, there would be a switch on the system unit, like the one on this month's cover, to select the computer type you would like to use.

Such a computer does not yet exist, but we're getting there. In this month's issue, you'll read about two interesting products—PC Transporter and Trackstar—you can use to create Apple II/IBM PC chameleons. Later this year, we'll review a software emulator called II in a Mac, which you can use to make a Macintosh run Apple II software, albeit slowly.

Perhaps the perfect computer for emulating all three computer types is the Macintosh II. If you want Macintosh functionality, you really have to use a Macintosh as the base computer, because it is so difficult to clone legally that you'll probably never see Macintosh emulator boards for Apple II or IBM PC computers. (Apple itself could try to develop one, but I'm sure it wouldn't bother.) The Macintosh II has several slots for coprocessor cards, and an IBM PC emulator card already exists (it's from AST Research). An Apple IIe emulator board would be fairly easy to develop too, given the existence of the Trackstar and the Laser 128.

Apple would be the logical company to develop a IIe emulator board (or even a GS emulator board) for the Macintosh. An obvious reason is that it could develop one efficiently, since it would not have to worry about the issues of copyright-infringement that haunt third-party developers.

It's a shame you can't buy a compact three-in-one computer with just one set of peripherals.

A less obvious reason relates to Apple's educational-marketing plans. I have no doubt that Apple would like to see more and more Macintoshes infiltrate the school system as the years go by. But it faces the same problem any other vendor has in cracking the current Apple II stranglehold, a reluctance of educators to switch from a computer with which they're quite happy.

The solution is to offer a "bridge" computer that runs existing Apple II software as well as Macintosh software. Such a computer would protect a school's software investment while giving it the opportunity to experiment with unique Macintosh software. This is exactly how Cordata and Tandy are trying to get MS-DOS computers into schools right now—they both offer the Trackstar card in an IBM PC clone. Tandy offers the card as an option, and Cordata builds it right into its WPC Bridge.

This strategy would assuredly be a

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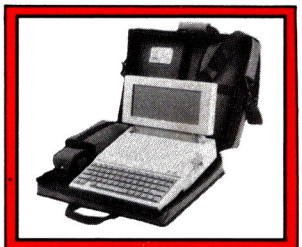

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EDITOR'S PAGE

winner for Apple, at least if the price were right and the emulation were perfect. (Educators, of course, could still buy a "pure" Apple II to save money.) I predict we'll see such an emulator within the next two years. What do you think?

AppleFest-ivities

The entire *A+* editorial staff has just returned from AppleFest in Boston. What a great show it was! We saw many exciting new hardware and software products on the show floor and a few still-secret goodies behind closed doors.

We weren't the only ones who enjoyed the show. The paid attendance of about 21,000 was significantly higher than for the same show eight months earlier in Apple's own back yard, San Francisco. The workshops were very well attended, despite a $125 entrance fee. This strong showing confirms our belief that the Apple II is selling better than ever and that there is still a strong demand for quality software and hardware products.

The most interesting software product at the show was, without a doubt, GSWorks from StyleWare. It combines six applications into one integrated software package: word processing, database, spreadsheet, page layout, painting, and communications. Despite preshow rumors, no one else demonstrated a similar product, not Claris, Beagle Bros, Mediagenic (aka Activision), or Brøderbund. GSWorks should be available in September.

The top new hardware product was the TransWarp GS accelerator card from Applied Engineering. This card, to be available at the end of the year, doubles the speed of the IIGS, making virtually instantaneous super-hi-res screen updates possible. This product, together with GSWorks, will make the IIGS a productivity powerhouse.

For a full AppleFest report, be sure to read the "NewsPlus" column in this issue.

Gary

GARY B. LITTLE/**EDITOR**

WordPerfect taps the power of mice and menus.

The most powerful word processor you can buy for your Apple® IIGS™ is wearing a brand new face these days. One that gives you the simplicity of a mouse and menu-driven interface, the speed of keyboard commands, and the power of literally hundreds of features.

Tapping Your IIGS.

Using WordPerfect for the Apple IIGS is as easy as looking at a menu, clicking on the feature you want, and typing away. Yet, WordPerfect offers another option that gives power typists the ability to invoke sophisticated features without ever leaving the keyboard.

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WordPerfect Flexibility.

In addition to running on the IIGS, WordPerfect is available for the IIe/IIc (with a 50,000-word dictionary). And files from both versions can be interchanged with WordPerfect files generated on other machines, including IBM® PC compatibles and some minicomputers.

No other word processor lets you flex the word processing muscle of your IIGS like WordPerfect. For more information, including special programs for educators, call or write WordPerfect Corp., 288 West Center St., Orem, Utah 84057 (801) 225-5000.

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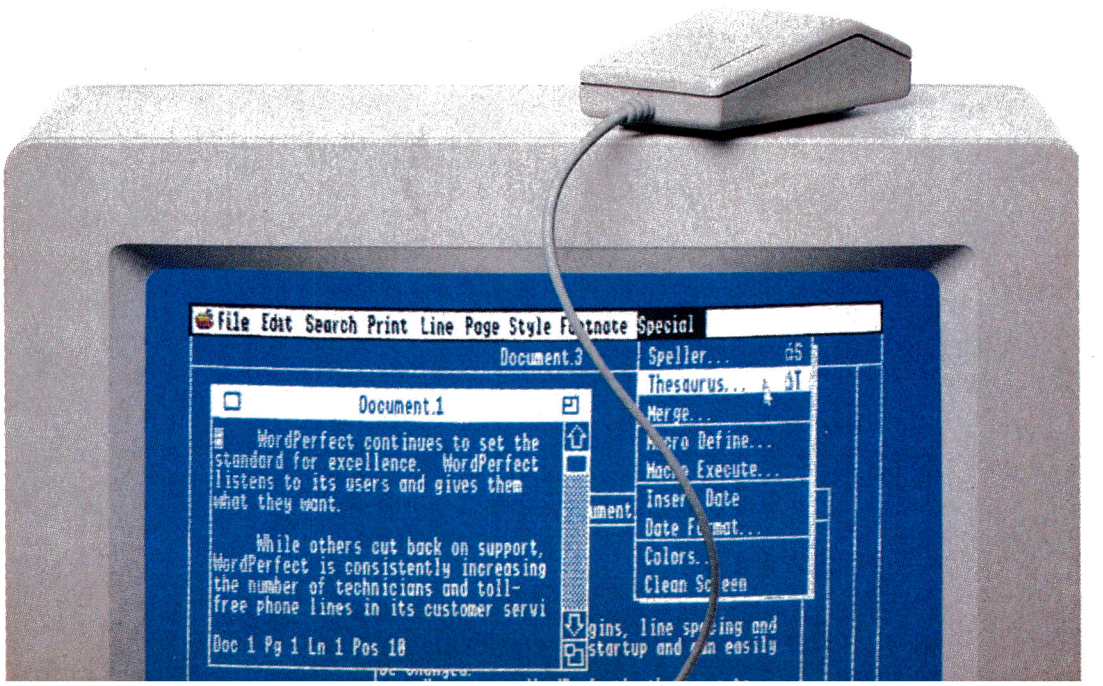
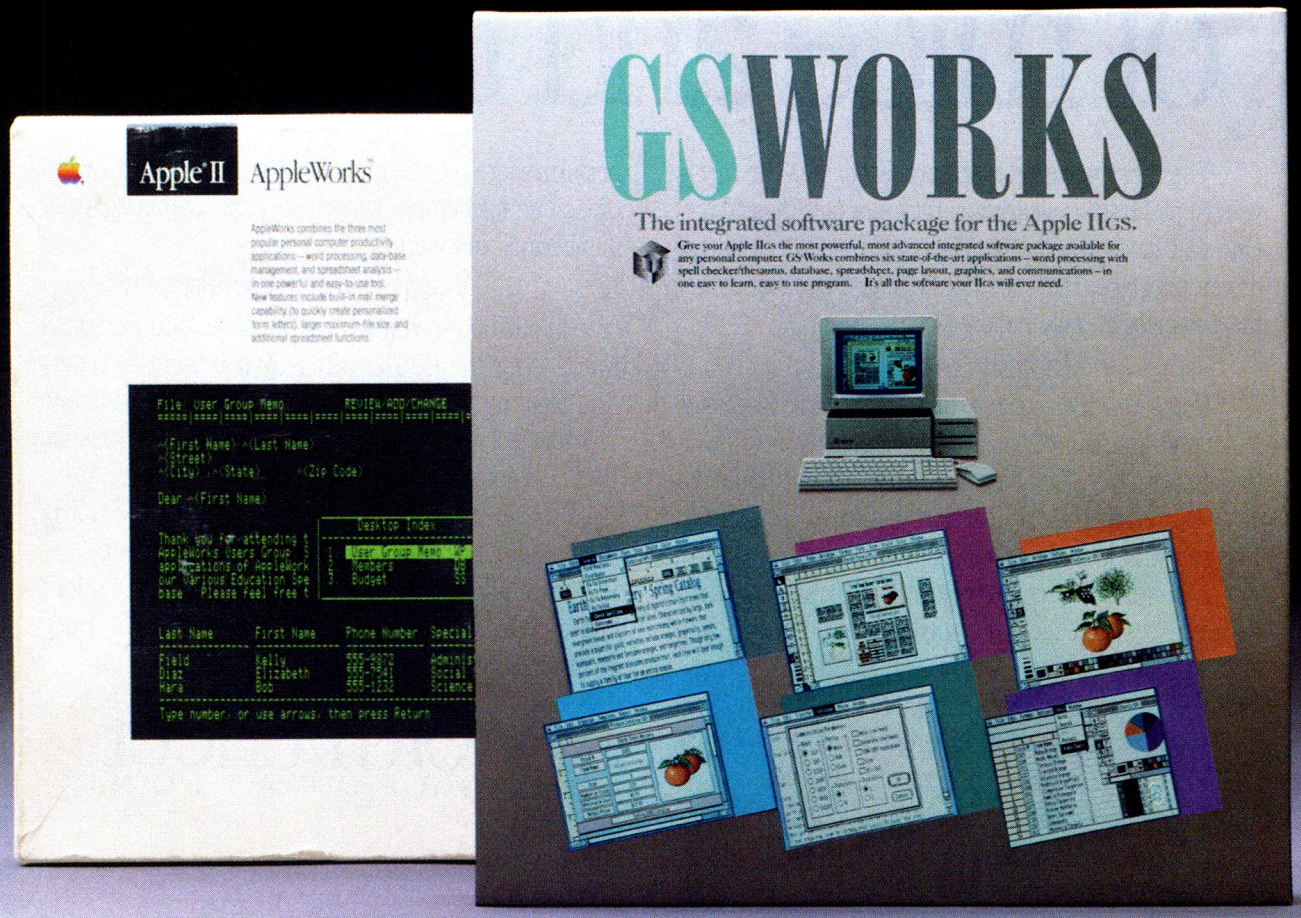


Now and then a single program sets a new standard in personal computing.



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Better because it improves on the three AppleWorks applications — word processing, database, and spreadsheet — with new features and dramatically increased power and sophistication. And adds the other three applications you need and use most — page layout, graphics, and communications.

Better because it combines these six productivity applications in a seamless, window-based environment. To give you an integrated package so advanced — yet so easy to use — that it has no equal on any personal computer. Not even Macintosh™ or IBM™.

Better because it's all the software you'll ever need for your Apple IIGS.

Upgrading The Three AppleWorks Applications . . .

GSWorks reads AppleWorks files as easily as it reads its own. So you can move from AppleWorks to GSWorks without missing a byte.

But GSWorks improves on the three AppleWorks applications by giving them all the features of true IIGS software. All GSWorks applications work the same way, using pull-down menus and WYSIWYG ("what you see is what you get") document display. Making GSWorks easy to learn, easy to use.

And each GSWorks application is so powerful, so complete, it could stand alone with the best IIGS software in its field.

Our high-powered word processor lets you create stylish documents using different fonts, print styles, and character sizes. With special features like automatic mail merge and the most advanced on-line spell checker/thesaurus ever available for an Apple II computer.

The versatile database lets you create forms, search and sort data, and print reports by just pointing and clicking. So you can keep track of even your most complicated information without complicated commands.

And for number-crunching, there's our mouse-based spreadsheet, with fast, intelligent recalculation and a host of number formatting features. And automatic color charting, when you want to make a splash with your figures.

. . . And Adding Three Of Our Own.

To give you *the* integrated software package for the Apple IIGS, we've added three new applications that fully exploit the advanced graphics, increased power, and enhanced communications connectivity of the IIGS.

Our state-of-the-art page layout application gives you the sort of desktop publishing power previously available only for Macintosh and IBM. To help you create professional-quality publications quickly and easily.

The GSWorks graphics application is revolutionary, combining the best features of draw and paint programs. With it, you'll have illustration capabilities never before available on a personal computer.

Finally, there's our communications application, connecting your IIGS to a whole world of on-line communications services. And letting you send and receive files from other computers.

What Integration Is All About.

What really makes GSWorks special is that it's much more than the sum of its parts. It's not just six great applications in a single box. It's six great applications in a single program.

Because GSWorks offers a whole new level of sophistication in integrated software. You can have all six applications on-screen at once. And open as many application windows as you need.

Move from one application to another by simply clicking on a different window. And move information between applications with a single movement of your mouse. Bring spreadsheet figures into a database file. Edit communications files with the word processor. Use the page layout application to combine graphics and text in polished multi-column documents.

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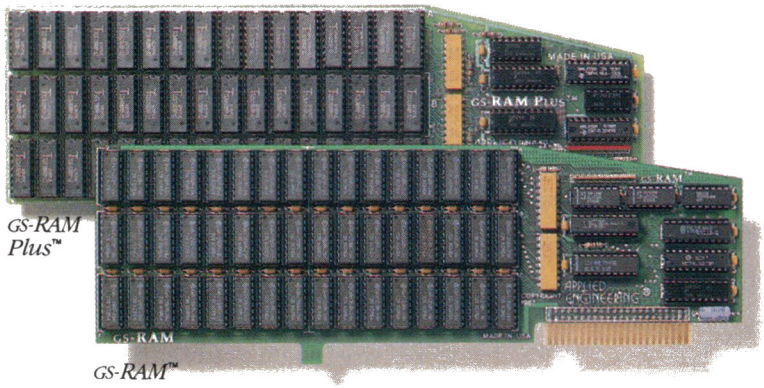

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We offer GS-RAM in two configurations so you can increase your memory 256K at a time (GS-RAM) or a megabyte at a time (GS-RAM Plus). Both are IIGS compatible and both come with our powerful enhancement software. GS-RAM can hold up to 1.5 MEG of 256K chips and GS-RAM Plus can hold up to 6 MEG using 1 MEG chips. And since both use standard RAM chips (not high-priced SIMM's), you'll find expanding your GS-RAM or GS-RAM Plus easy, convenient, and very economical. For further expansion, you can plug a 2 MEG "piggyback" card into the GS-RAM's expansion port for up to 3.5 MEG of total capacity. Or up to a whopping 8 MEG on GS-RAM Plus. If a GS-RAM owner outgrows 3.5 MEG, he can easily upgrade to GS-RAM Plus for a nominal charge.

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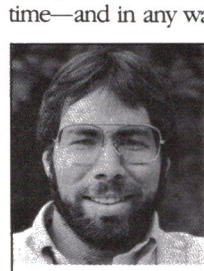

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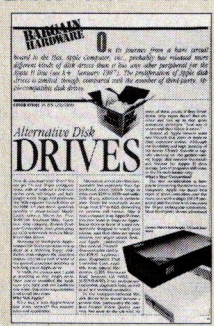
LETTERS TO THE EDITOR

IIc DRIVE PRICES

Dear A+: I own an Apple IIc. For the last two months, I have been comparing disk drives. I have found that the Apple 5.25 Drive for the IIc costs $229 at a discount store. At the same time, I have found that the Laser disk drive costs $89 at the same store. I've priced some of the other disk drives, and they all seem to be a lot cheaper than Apple's version. I realize that you pay for the Apple name, but I still don't see a $100+ difference for the name. Can you explain the big difference in price for me?


BARGAIN HARDWARE

Alternative Disk
DRIVES

JEFF SCHMIDT
NORTH OLMSTED, OH

All 5¼-inch disk drives are not created alike, as Bob Lindstrom explained in his article "Alternative Disk Drives" (March 1988, page 47). In addition to cosmetic considerations such as styling and size, you must take into account daisy-chain capability, type of connector, and availability of servicing. The IIc and IIGS require drives with DB-19 connectors, although adapters are available for $20 that allow the use of drives with 20-pin rectangular connectors (the older IIe style).—Editors

WHERE'S THE GOOD STUFF?

Dear A+: Jon McPhee's April letter, "Computing in the Late '80s," is right on target. I've been a die-hard Apple fan for years, but my support is waning. Although I own a souped-up IIGS with third-party equipment filling every available slot, I no longer "strongly" recommend the Apple II to friends seeking computer advice.

I keep waiting and praying for Lotus 1-2-3, dBASE III or any relational database, and WordPerfect 4.0-equivalent software from Apple or any third-party developer. We're getting closer—e.g., WordPerfect's latest IIGS attempt—but still no cigar. Several years ago, you couldn't and shouldn't have expected near-equivalent IBM/MS-DOS-strength software—you'd have purchased a Macintosh or PC-compatible. Today, however, you can buy well-established IBM PC clones at prices significantly lower than that of a IIGS packed with third-party equipment. And what is so maddening is that the IIGS is able to run decent software.

Granted, the graphics and sound features of the newest Apple II are great, and burgeoning software for G & S is promising, but when do we get the "good stuff" for work, college, and small-business management? Home computers are used for more than games and education. I would congratulate Manzanita and some other companies if they made decent accounting software available.

The very respectable AppleWorks has been our workhorse for four years; we (my three teenage sons, my wife, and I) are tired of add-ons/patches, however. They are attractive as you gain computer literacy and explore your software needs, but we've grown tired of trying to find a way to make AppleWorks work better and waiting for for an add-on program to be "invoked."

I still love my Apple, and I will continue to wait for better-performing software. But Apple should beware! My oldest son starts college next year, and he wants a computer in the worst way. The Macintosh is too expensive, and the Apple IIGS is shy in the decent-software department. I guess it will be a Tandy 1000 TX or Leading Edge product that gets our money. I just wish Apple and Claris would get the message that we small guys don't think the IIGS is a toy.

DAVE CANNON
VICTORVILLE, CA

This month's cover story looks at ways to bridge the worlds of MS-DOS and the Apple II. We discovered that, for some users, it doesn't have to be an either/or situation.—Editors

LETTERS

MS-DOS OR THE II—IT DEPENDS

Dear *A+*: I read with interest the letter by Jon McPhee ("Computing in the Late '80s") in the April issue of *A+*. The question is not so much a matter of which is the better computer—an Apple II or an MS-DOS machine—but for which machine the better software is available. Having an Apple IIGS at home and the use of an MS-DOS machine at work, I believe the answer is that it depends. Certainly more productivity software is available for MS-DOS machines than for the Apple II series, but the crux of the matter is quality and not quantity.

Many MS-DOS programs *appear* more powerful than programs available for the Apple IIs, but this apparent power leads to such complexity of operation that even simple tasks such as saving or printing a file become difficult. Admittedly, the MS-DOS machines are faster than the Apple II in some operations (e.g., calculations and file loading and saving), but, for me, data entry and manipulation are the rate-limiting step, and I find them faster on my Apple IIGS.

I appreciate the ease with which you can learn to use most programs written for the Apple II series of computers, and the operating environment of the Apple IIGS has taken that ease to a new and higher plain. I appreciate the use of mnemonics (open-apple/S means *save*, open-apple/Q means *quit*, and so on), and Apple is to be commended for the establishment of standards for software developers, something that appears to be unheard of in the MS-DOS world.

Should you limit your use of a computer to one, two, or perhaps even three programs, to applications requiring frequent and extensive recalculation, and to a maximum of 640K of RAM, then I will admit that MS-DOS machines and software are probably superior to what you can find in the Apple II world. Should you, however, want to explore the full potential of today's personal computers—which requires the use of a variety of software packages and, perhaps, some personal programming—then I would have to say that the Apple computers, both the IIs and the Macs, are clearly superior. All in all, Apples of any variety are far more versatile, capable, and convenient than the MS-DOS machines.

Good to excellent packages are available for the Apple II computers in all categories except spreadsheets (I found it interesting that you did not have an *A+* All-Stars category for spreadsheets). The AppleWorks spreadsheet module lacks many necessary functions, not the least of which is graphics. SuperCalc3a is full-functioned, but it's too small for many serious applications, and its publisher, Computer Associates, seems to have abandoned it. VIP Professional, although more than adequate in size and functions, is, according to your own review, poor. This deficiency is my major gripe about Apple II software, and I long for the day

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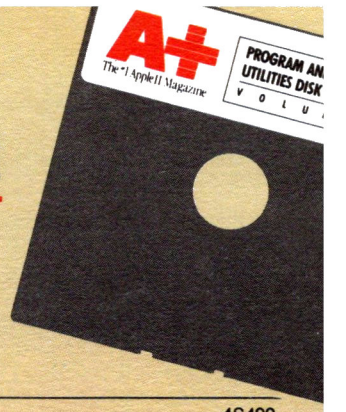

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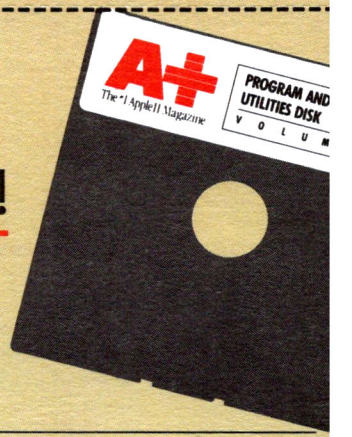

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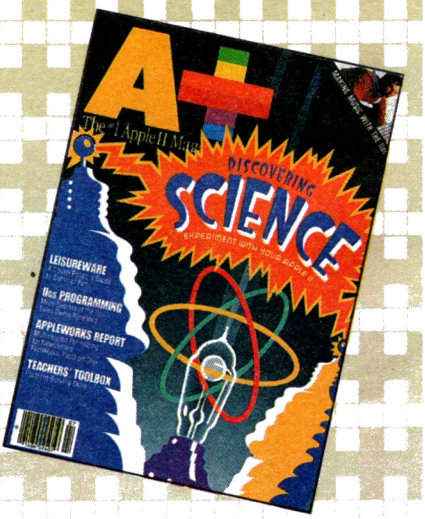

LETTERS

when someone will publish a decent, full-functioned spreadsheet program for us.

So where does all of this lead us? Well, I, for one, will continue to preach the Apple gospel. For me, the capabilities of the Apple IIs are more than adequate, and the convenience of the software is commendable. "Limitations"—inaccurate as the word is—are challenges, not insurmountable hurdles.

DR. W.S. MARDIS
E. AMHERST, NY

TIMEOUT GRAPH CLARIFIED

Dear *A+*: In regard to your April cover story, "Exploring the AppleWorks Universe," I would like to correct a mistake concerning the TimeOut Graph program. The articles states that ". . . you can store only one chart definition for each AppleWorks spreadsheet file." *That statement is simply not true.* I have created and saved to disk numerous separate charts and graphs relative to one spreadsheet. To save more than one chart, simply create different graphs and save the different graph settings under different names. The format I use is the spreadsheet filename, with .GFn appended. The number of graph-settings files you can create and save for any one spreadsheet file is unlimited. You must use the TimeOut FileMaster or AppleWorks Other Activities–List all files selection to list the graph-settings files on the data disk, since the AppleWorks Add a file to Desktop selection cannot list this type of file.

I have used all the graphics programs reviewed in the business-graphics section of the article, and I rate TimeOut Graph as #1. The primary reason I give TimeOut Graph the top rating is because it works inside AppleWorks. The others are stand-alone products that require considerable planning of graph scales, settings, headings, and the like for inclusion in the spreadsheet before you use the program. I've often had to abort a graphing session while using Graphic Edge or Visualizer with an AppleWorks spreadsheet and return to AppleWorks to enter scale data, headings, etc. into the spreadsheet. Having to do so was annoying; therefore, I now use TimeOut Graph almost exclusively.

PAUL E. PENNEBAKER
SLIDELL, LA

APPLIED SCIENTIFIC TEMPLATES

Dear *A+*: Thank you for including our templates in your April 1988 article "Exploring the AppleWorks Universe." A couple of clarifications are in order, though. First, our Accounts Payable, Accounts Receivable, Payroll, and Financial Calculator are indeed for small-business accounting. Our Accountant and Investment Portfolio are for personal financial management.

Second, our business templates are not only "for small businesses with few customers, employees, and suppliers." None of the templates limit the number of entries. The amount of RAM is the only limiting factor.

ROBERT J. FLAHERTY
PRESIDENT, APPLIED SCIENTIFIC
BOZEMAN, MT

CLOSING THE GAP

Dear *A+*: As a fledgling foster parent and a newcomer to the world of computers, I was pleased to see a listing for The Apple Computer Resources in Special Education and Rehabilitation in the March "NewsPlus." I would like to share another resource with you: an organization called Closing the Gap. It produces a bimonthly publication on the use of computer technology in the education of the handicapped. The subscription rate is $21 per year.

Closing the Gap also publishes a yearly *Resource Directory* that contains about 1800 listings of hardware, software, producers, and organizations. I have found the articles and directory valuable right from the start in this very confusing and diversified area.

You can contact Closing the Gap at (612) 248-3294 or write to Closing the Gap, Box 68, Henderson, MN 56044.

BARRY SIMMONS-STUBER
MESA, AZ

DENTIST SAVED FROM MS-DOS

Dear *A+*: I would like to relate my experience in computerizing my dental practice, because it may benefit other small businessmen in similar situations.

I have been a dedicated Apple IIe fan for several years, using AppleWorks for many aspects of my dental practice. When I made the decision to fully computerize my office, I realized that AppleWorks was not powerful enough to meet all my needs, and I did not have the time to learn how to program or use a complicated relational database. I consulted several dental-software and -hardware salesmen, who literally laughed at me when I told them I was looking for something that would run on an Apple II. They all agreed that the Apple II was a "toy" or "home" computer and attempted to steer me into the world of MS-DOS.

Having subscribed to *A+* for several years, I was fully aware of what the Apple II could do—it was just a matter of searching hard enough to find the right software. I did find several dental-office-management programs written for the Apple II, but most of the software had been written in DOS 3.3, was no longer supported by the authors, and did not handle lowercase letters. I was disappointed, disillusioned, and within days of plunking down the $15,000 most turnkey MS-DOS systems require for hardware, software, training, and support. Maybe the salesmen had been right!

Enter Byte Doctor Software. Dr. Donald Riale, a dentist in Pennsylvania, had written and recently started to market a complete dental-office-management system in ProDOS for the Apple IIe. I had been saved! Not only does the software run as advertised, but it also includes features I found in very expensive systems, it's very easy to learn and use, I did not have to scrap my beloved Apple, and Dr. Riale supports his software beyond the call of duty.

The moral of this story is that the Apple II is a very effective business machine: We just need more dedicated Apple enthusiasts such as Dr. Riale to write the programs.

ROBERT E. MURPHY
LOS ANGELES, CA

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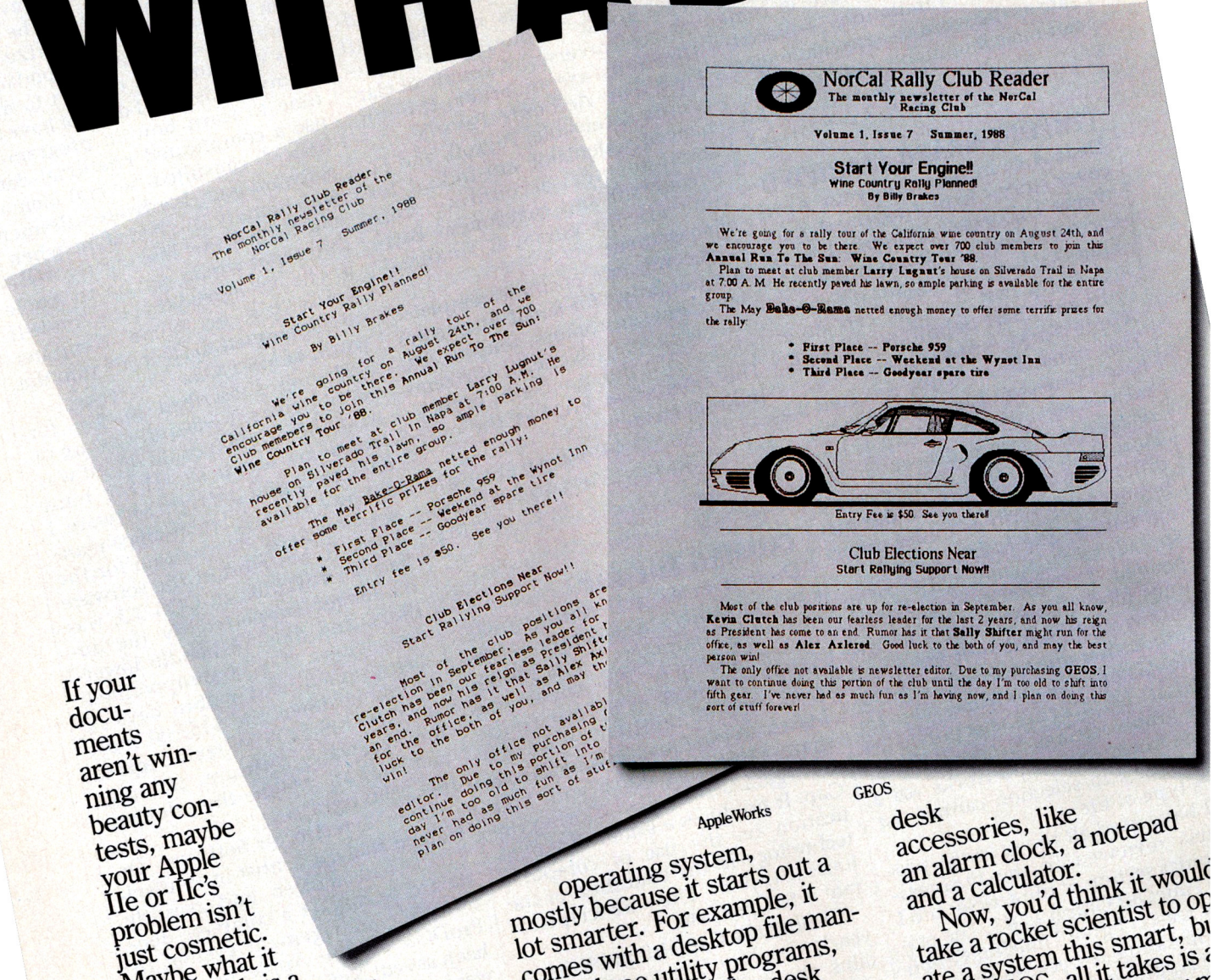
WITH A BRAIN



NorCal Rally Club Reader
The monthly newsletter of the NorCal Racing Club

Volume 1, Issue 7 Summer, 1988

Start Your Engine!!
Wine Country Rally Planned!
By Billy Brakes

We're going for a rally tour of the California wine country on August 24th, and we encourage you to be there. We expect over 700 club memebers to join this **Annual Run To The Sun: Wine Country Tour '88**.

Plan to meet at club member **Larry Lugnut's** house on Silverado Trail in Napa at 7:00 A.M. He recently paved his lawn, so ample parking is available for the entire group.

The May **Bake-O-Rama** netted enough money to offer some terrific prizes for the rally:

* **First Place -- Porsche 959**
* **Second Place -- Weekend at the Wynot Inn**
* **Third Place -- Goodyear spare tire**

Entry Fee is $50. See you there!!

Club Elections Near
Start Rallying Support Now!!

Most of the club positions are up for re-election in September. As you all know, **Kevin Clutch** has been our fearless leader for the last 2 years, and now his reign as President has come to an end. Rumor has it that **Sally Shifter** might run for the office, as well as **Alex Axlered**. Good luck to the both of you, and may the best person win!

The only office not available is newsletter editor. Due to my purchasing **GEOS**, I want to continue doing this portion of the club until the day I'm too old to shift into fifth gear. I've never had as much fun as I'm having now, and I plan on doing this sort of stuff forever!

If your documents aren't winning any beauty contests, maybe your Apple IIe or IIc's problem isn't just cosmetic. Maybe what it really needs is a new brain. Like GEOS.

GEOS is the new graphic operating system that takes everything you do—including AppleWorks files—and makes them even better. Better looking. Better working. Better everything.

It's easy when you have the brains.

GEOS is a completely integrated environment that runs [illegible]nd every other AppleWorks operating system, mostly because it starts out a lot smarter. For example, it comes with a desktop file manager, three utility programs, four applications, five desk accessories, eleven fonts and, well, you get the idea. All of which opens your Apple II to all kinds of graphically-oriented applications, like writing, painting, merging, desktop publishing, calculating and all that other fun stuff the more expensive Apples do.

There's even a set of pop-up GEOS desk accessories, like an alarm clock, a notepad and a calculator.

Now, you'd think it would take a rocket scientist to operate a system this smart, but with GEOS, all it takes is a point and a click of your mouse. Or touch of a joystick. Or a touch of a keyboard.

That's it.

With GEOS, you just pull down a menu or point to an icon. Click and zap—you're done. No complicated commands

...UR LOOKS TRANSPLANT.

No perplexing problems.
Pretty easy, right?
Well, GEOS is easier on your eyes, too. Because the clear, sharp hi-res stuff you see on the screen is exactly what you get when it's all printed out.

Turn your ugly ducklings into prints charming.

Of course, the real beauty of GEOS is how it turns any word processing document into a work of art—in seconds. And you can do it because GEOS comes with a TextGrabber™ that's ProDOS compatible. You just pour in your AppleWorks, WordPerfect or MultiScribe text, and in less time than it takes to say, "Yikes! What a great looking document!," your text is converted into geoWrite™ 2.1, the What-You-See-Is-What-You-Get word processor that lets you center, justify, search and replace text, move blocks of copy, cut, paste graphics and select fonts of different styles and sizes right on the screen.

You still with us? Okay. Now get ready to squeeze your Apple for all it's worth.

For those really plain Jane's, we recommended a beauty treatment with geoPaint,™ which lets you draw, shade, fill, and pattern with incredible detail. There are all kinds of textures and brushes and graphic devices that ingeniously turn ordinary work into works of genius.

Manage this. Merge with that. Proof the spelling with geoSpell™ and pretty soon you're ready to print it all out with hi-res clarity on any dot matrix printer.

Or if you're really out to break some hearts, a LaserWriter.™

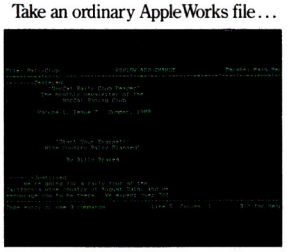
The incredible expanding brain.

There are even more GEOS applications on the way, too. Spreadsheets, databases, desktop publishers—you name it. All of them importing and exporting to and from each other, so that you can manage everything with one integrated system.

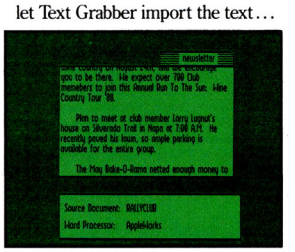
So if you think your document could do with a facelift, don't just do a little cosmetic surgery. Give your Apple II a brain transplant.

After all, what good are looks if you ain't got the brains to go with 'em?

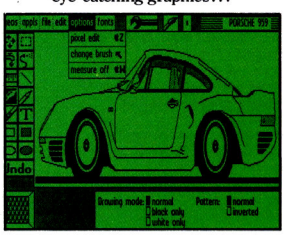
Take an ordinary AppleWorks file...

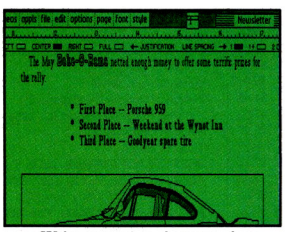


let Text Grabber import the text...

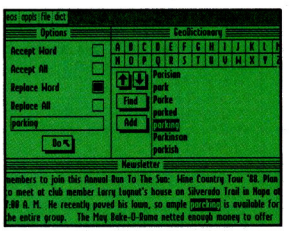


geoPaint create eye-catching graphics...





geoWrite spruce up formats, fonts, styles and add those graphics...



and geoSpell check the spelling.

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- TextGrabber,™ text importer/converter
- geoSpell,™ spelling checker
- geoMerge,™ mail merge
- geoPaint,™ hi-res graphics editor
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GS-Ram 256K (IIGS)	186.00
GS-Ram 512K (IIGS)	300.00
GS-Ram 1MB (IIGS)	525.00
GS-Ram PLUS 1MB	535.00
Z-Ram Ultra 3 512K + Clock + Z-80 (IIc)	410.00
Z-Ram Ultra 3 1MB + Clock + Z-80 (IIc)	622.00
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Z-80Plus (II+, IIe, IIGS)	114.00
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Timemaster H.O. (II+, IIe, IIGS)	77.00
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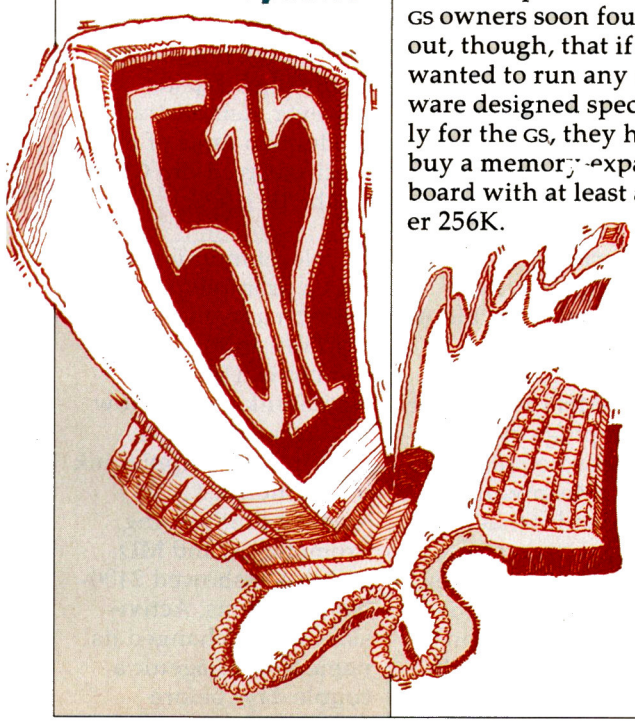
BY LISA RALEIGH, OWEN LINZMAYER, AND SHANON CULLEN

NEWSPLUS

Apple expands IIgs memory, on-line services compete for II users, exhibitors flock to East Coast AppleFest, and other industry updates



THANKS FOR THE MEMORY

At long last, Apple Computer has decided to make the IIGS available with 512K as the standard amount of memory that the $999 suggested retail price gets you.

If you recall, Apple has sold the GS with only 256K since its introduction in September 1986. GS owners soon found out, though, that if they wanted to run any software designed specifically for the GS, they had to buy a memory-expansion board with at least another 256K.

Actually, what new GS buyers will get is a 256K machine with Apple's memory-expansion card included, meaning that Apple has effectively reduced the retail price of the IIGS by $129, the suggested price of the memory board. If you want to expand RAM past the 1Mb limit the Apple board imposes, you'll need to get rid of it in favor of a higher-capacity card such as the Applied Engineering GS-RAM, Checkmate's MultiRam GS, or the MDIdeas OctoRam. Alternatively, you could buy the Checkmate Technology MemorySaver or AE's RAMKeeper, both of which allow you to use Apple's memory card with those of third parties.

100,000 USERS AND $100 OFF

Just as AppleLink—The Personal Edition, Apple's official on-line service, is making its debut (see "AppleLink—The Personal Edition" in our July issue), another on-line service has announced it has signed up its 100,000th subscriber. And a third service is offering a special sign-up deal for Apple II users that will amount to $100 in savings.

GEnie, which has a special-interest section for Apple II users, said that it reached the 100,000-subscriber level last March, less than 2½ years after becoming operational in October 1985.

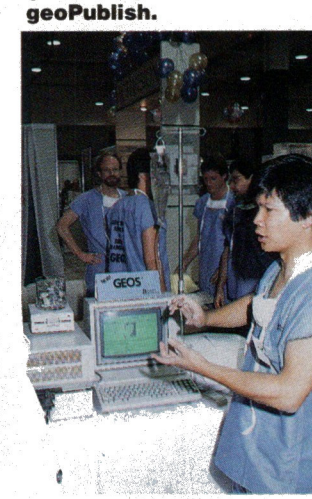
The 100,000th GEnie subscriber—Donald F. DeSorte, of Atco, New Jersey—signed up after reading about a special offer in the popular Apple II newsletter *OpenApple*. He subscribed to GEnie mainly to access the Apple II RoundTable.

GEnie claims to be the fastest-growing consumer information service. It will be interesting to see how AppleLink compares when it comes to signing 'em up.

Meanwhile, The Source is trying to draw more Apple II customers by offering a special deal for signing up as a new user. Through July 31, The Source will waive the $29.95 sign-up fee and give a $60 credit for on-line time over the next 12 months. In addition, the price of the service's users' manual is reduced by $9 for new recruits. For further information, call The Source at (800) 336-3366.

ILLUSTRATIONS BY COURTNEY GRANNER

NEWSPLUS



In surgical scrubs that say "Give Your Apple II a Brain Transplant," Berkeley Softworks employees demo GEOS and new applications for it: geoCalc, geoFile, and geoPublish.

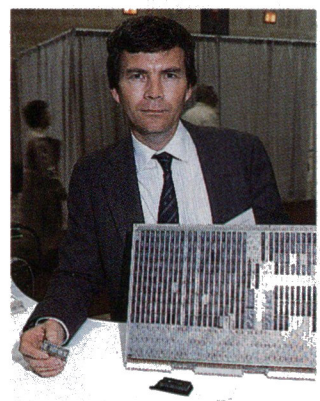
APPLEFEST NEWS

Before the doors opened at the May AppleFest show in Boston, we were a little bit skeptical about how successful it would be. But we're happy to report that the show was a hit—we no longer wonder about the Apple II's ability to sustain two AppleFests in one year.

AppleFest had been revived the previous September in San Francisco, after a four-year stretch without any major Apple II-only show. The San Francisco AppleFest came off respectably well, but we were somewhat dubious about the prospects for a second show in a city that seemed more oriented toward the Mac and IBM PC than the Apple II. We also wondered if the small companies that kept the Apple II market alive would be able to afford to exhibit at two shows in one year. And we had heard that the AppleFest promoters had opened exhibit space up to Macintosh developers to ensure that floor space was sold out.

Well, here's the bottom line on the show: There were more than 21,000 paid attendees, who saw about 150 exhibitors, none of which were Mac-only. (A few booths had some Macintosh products on display, but they were in the vast minority.) In terms of exhibit space, the show was 80% larger than the one in San Francisco. The day-long AppleWorks sessions were sold out, and many of the panel discusssions were standing-room only. In all, it was an admirable success.

Apple Computer's booth was the front-and-center attraction at AppleFest.



Bob McCaslin, president of Zip Technology, shows a prototype of the Zip Chip and the (finally) finished product.

AppleWorks author Bob Lissner and his wife, Kris, talk shop with Curtis Koppel, vice president of Russ Systems.

As with the previous AppleFest, many new products were on display. Keep in mind as you read the following show highlights that many of these products are not yet available. Our aim is to give you an idea of what's coming and show that the Apple II community continues to introduce innovative products.

■ Speed and more speed was the order of the day at AppleFest. Applied Engineering showed a working wire-wrap prototype of TransWarp GS, a $299 speed-up card for the Apple IIGS that AE plans to ship by year-end. AE says TransWarp GS will increase processing speed from 2.8 MHz to 6 MHz. Bits & Pieces Technology showed the Rocket Chip, a $159, 5-MHz accelerator chip that plugs into the motherboard of an Apple IIe or IIc. Meanwhile, two companies that had announced GS accelerators at the last AppleFest didn't follow up at this show with any demonstrations. MDIdeas didn't have its GS accelerator on display (although the company said development was still underway), nor did Zip Technology. Zip *did*, however, demonstrate production units of its much-delayed Zip Chip for the IIe/IIc.

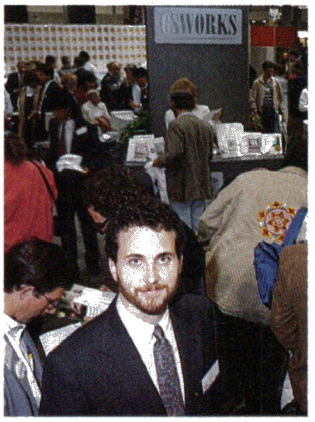
■ Telecommunications took a prominent position as well. Apple officially announced its commercial service, AppleLink, at the show (see a feature-length description of AppleLink in last month's *A+*). Applied Engineering, Prometheus, and MDIdeas each showed 2400-baud modems. Activision, which changed its name to Mediagenic a couple days before

PHOTOS BY HERB BETHONEY

Technical editor Owen Linzmayer fields questions from an *A+* reader.

Pinpoint president Greg Hastings discusses Apple's network with executive editor Lisa Raleigh.

Entertainment editor Bob Lindstrom gets a demo of Diversi-Tune from Bill Basham, president of Diversified Software Research.



Kevin Harvey, president of StyleWare, was pleased that his newly announced (but still unfinished) GSWorks drew a crowd.

AppleFest, showed a prerelease version of a GS-specific telecommunications program called Teleworks Plus.

■ Beagle Bros introduced several new additions to its TimeOut series of AppleWorks enhancements, including TimeOut Thesaurus, TimeOut PowerPack (a set of ten utilities), TimeOut DeskTools II (nine desk accessories), and TimeOut MacroTools (ready-made macros).

■ Checkmate Technology demonstrated an Apple IIc multifunction board, the working name of which is IIc Instantly. The product, which is to be available by year-end, is a 1Mb internal memory card that also has a built-in ProDOS clock and screen-dump capabilities. The name derives from the card's ability to let you, via a battery backup, shut off the power, no matter what you're doing, and start up again right where you left off when you flip on the power switch again.

■ Apple IIGS music and sound products made a splash at AppleFest too. Diversified Software Research showed Diversi-Tune, a $55 software program that allows the GS to do multitrack recording—it records MIDI input and can play it back and record again while you play along with it. And, at a special *A+* presentation, Brøderbund made its first public showing of the IIGS version of Jam Session, an innovative Macintosh product that lets you use the computer keyboard to "jam" with music produced by the software. On the hardware side, Applied Engineering showed its Sonic Blaster, a $129 digitizing card, as well as Audio Animator, a $329 board that combines digitizing and MIDI-interface capabilities. MDIdeas showed the final version of its $189.95 Digitizer Professional, announced at the last AppleFest and now shipping. And Parallax demonstrated its $39.95 Sound Ace audio digitizer.

■ The latest incarnation of DB Master Professional was on display in the Stone Edge Technologies booth. This $295 relational-database program promises to be everything its publisher claims it will be: fast, powerful, and capable of handling highly sophisticated tasks.

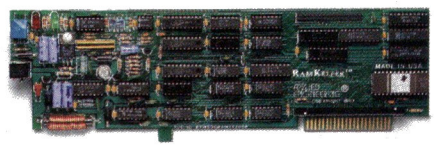
■ Educational highlights included WordBench, a sophisticated writing tool for all 128K Apples from Bank Street College, published by Addison-Wesley; Slide Shop, a presentation package from Scholastic; and The Children's Writing and Publishing Center from The Learning Company.

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



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

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

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efficiently to keep your Apple running cooler.

Powers two memory cards in the same slot.

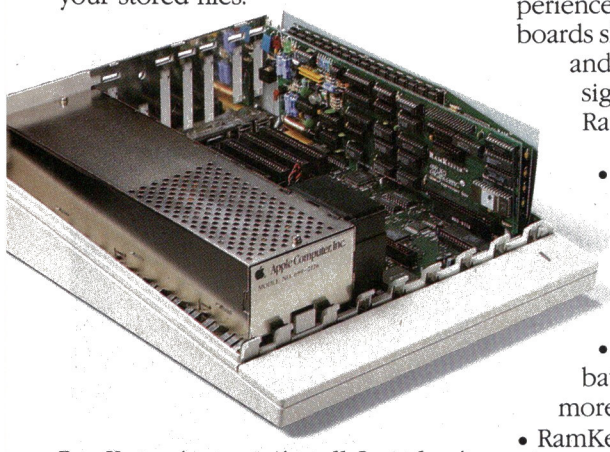
Have Apple's memory card, but now want the features of Applied's GS-RAM card? With RamKeeper, both cards act as one larger card. In one slot. Just attach one memory card to each side of RamKeeper and plug RamKeeper into the slot. And even with two cards, you can still keep slot 7 open with our optional 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.

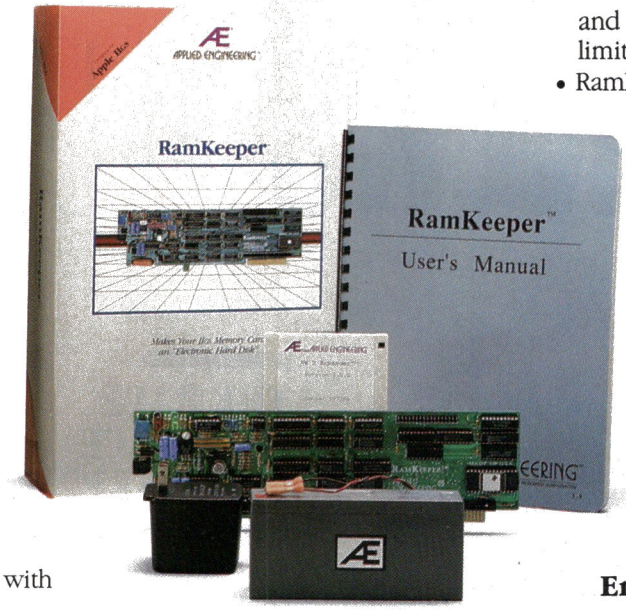
Makes all your memory usable memory.

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 Kilobytes 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.

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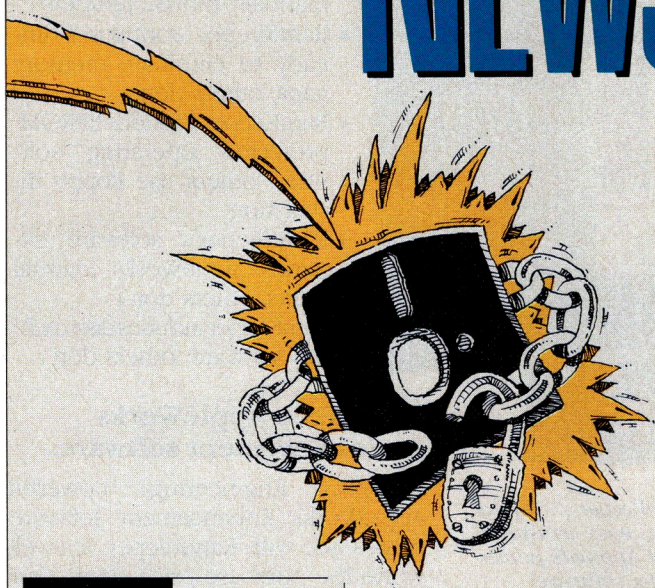


BAUDVILLE DROPS COPY PROTECTION

Copy protection has long been the bane of power users who want to make the most of their hard-disk drives and RAM-disks. Recognizing that copy-protection schemes alienate their legitimate customers while doing little to stave off dedicated pirates, many software publishers have admirably begun distributing their products sans protection.

The latest publisher to adopt this risky stance is Baudville, well known for Blazing Paddles and 816/Paint. Bill Darooge, president of Baudville, recently announced plans to remove copy protection from all products developed in-house. (You may remember that in June we reported that Electronic Arts had decided to drop copy protection from its "creativity" and Deluxe titles.)

Explains Darooge, "Nobody likes copy protection, including software publishers. Copy-protection schemes are difficult to implement and maintain, cause disk-duplication problems, and ultimately frustrate consumers." While recognizing that the removal of copy-protection schemes may facilitate unauthorized duplication (pirating), Darooge feels that the growing popularity of mass-storage devices necessitates this step. Besides, he hopes that as the universe of legitimate users expands, the threat of piracy will diminish proportionally.

All future Baudville programs written in-house will be free of copy protection, although entertainment packages produced by third-party developers may be protected if the authors insist on it. Many of Baudville's current offerings are unprotected, and as the company updates the masters for its other existing products, it will remove their copy-protection schemes as well. For more information, contact Baudville at 5380 52nd Street S.E., Grand Rapids, MI 49508; (616) 698-0888.

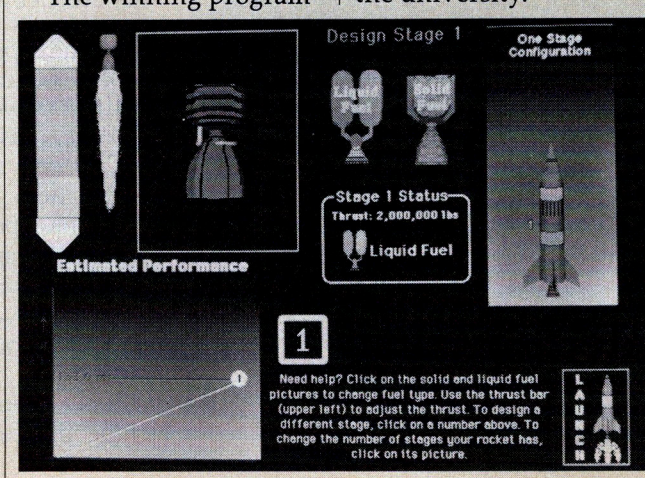
THE RACE FOR SPACE SOFTWARE CHASE

Visitors to the Smithsonian Institution's National Air and Space Museum next year will be able to test their abilities to design and launch rockets into space, using an interactive computer program created by three college students. The program is the winning entry in the Race for Space Software Chase, a nationwide software-writing contest sponsored by the Smithsonian and Apple Computer.

The contest involved writing two-minute interactive computer programs demonstrating ways computers are used in aviation and space flight. The entries were judged in the following four categories: content, creativity, ease of use, and use of computer-science methodology.

The winning program will be placed in the new Smithsonian gallery, Beyond the Limits, that will showcase the role computers play in aerospace technology. The software will demonstrate how changing variables such as thrust, weight, and fuel type affects a rocket's ability to overcome gravity and leave the earth's atmosphere. Once a visitor arrives at a workable design, the program will "launch" the rocket, calculate the maximum altitude it will reach, and compare the results with those of other visitors.

The software was designed by students from the California Institute of Technology: Pierce T. Wetter III, a junior electrical-engineering major; Mike Meckler, a sophomore physics major; and Glenn C. Smith, a junior physics major. The grand prize includes a summer internship at the museum for one member of the team and ten computers donated by Apple to the university.



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NEWSPLUS

THE ZIP CHIP TALE

Zip Technology burst onto the Apple II scene at the September 1987 AppleFest show in San Francisco with the announcement of a remarkable product concept called the Zip Chip. It is a microprocessor replacement claiming to run four times faster than the normal 65C02 CPU, and it seemed destined to cause a lot of excitement in the Apple II world. Cause a lot of excitement it did, but for all the wrong reasons.

The first indication that something was wrong was that although the Zip Technology staff was taking prepaid orders at the show, not a single, working Zip Chip was in evidence. AppleFest attendees received assurances that quantity shipments would begn "within a few weeks."

According to Zip Technology president and owner Bob McCaslin, the design of the chip was finished at the time of AppleFest, and the firm expected to receive the first shipment from its off-shore manufacturer shortly after the show. The first batch of chips was defective because of a manufacturing mistake, however, and the second shipment was plagued by a yield rate of only 2% (2 good chips out of every 100). To make matters worse, the manufacturing facility shut down for two weeks to celebrate the New Year.

After several months had gone by with no signs of any Zip Chips, people began getting anxious and expressed their concerns on CompuServe, GEnie, and other on-line services. Believing that the manufacturing problems would clear up, Zip continued to tell callers time and time again that the Zip Chip would ship "in a couple of weeks."

Having seen our share of vaporware and not wanting to fuel the fires of speculation, we hesitated in running a review of the Zip Chip until we were certain that it was shipping in significant quantities to the general public. As a result, we held off on printing Michael Fischer's review until this issue (see "The Zip Chip"), even though we'd received a Zip Chip for evaluation in late March.

As of the first week in May, Zip Technology had tens of thousands of orders for Zip Chips, which it hoped to fill by month's end. The company now has two sources for all its parts and maintains three separate manufacturing facilities. Furthermore, McCaslin vows "never to announce another product until we have thousands of them in inventory." Zip Technology seems to have learned its lesson the hard way.

CIRCLE 235 ON READER SERVICE CARD

NEWSPLUS UPDATE

■ United Software Industries has released version 1.5 of ASCII Express MouseTalk. This version provides additional protocols, and also takes advantage of extended RAM, lets you set any file type when downloading a file, and works with all popular 2400-bps and higher-speed modems. Retail price is $119.95. The update is available to all registered MouseTalk owners for $25, plus $2.50 for shipping. Send your check plus your original master disk to United Software Industries, Attention Product Update, 8399 Topanga Canyon Blvd., Canoga Park, CA 91304. For more information, call (800) 332-7244 or (818) 887-5800.

■ A free catalog for educators, *The AppleWorks AppleWorking Software Catalog*, is available from K–12 Micro-Media Publishing. It contains descriptions of AppleWorks programs available from the firm, including the SchoolWorks series of file disks especially designed for teachers, special educators, and personnel in school offices and media centers. For a copy, write to K–12 Micro-Media Publishing, 6 Arrow Road, Ramsey, NJ 07446 or call (800) 922-0401.

■ Scholastic has released three new Graphics Activity Packs for use with its SuperPrint program. These curriculum-specific packs contain double-sided graphics disks plus a teachers' guide with classroom activities.

Early Learning (Pack I) contains fairy-tale characters, puppets, safety signs, a pop-up town, circus figures, a doll house, and seasonal characters.

U.S. Maps (Pack II) contains a large U.S. map, maps of each state, state landmarks, and resources. World Maps (Pack III) contains maps of major world regions, selected countries, landmarks, and resources. To order or for more information, write to Scholastic Software, Scholastic, Inc., 2931 East McCarty Street, P.O. Box 7502, Jefferson City, MO 65102 or call (800) 325-6149 or—in MO—(800) 392-2179.

■ Accolade is the latest of the entertainment-software publishers to offer oldies but goodies at cut-rate prices. The Apple II titles in the Accolade "All Time Favorites" product line are Hardball!, Fight Night, Dam Busters, Killed Until Dead, and Law of the West. The price for each title is now $14.95. Accolade is located at 20813 Stevens Creek Blvd., Cupertino, CA 95014; (408) 446-5757. +

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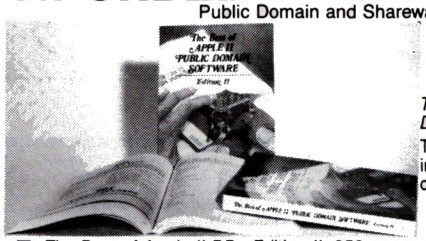

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Hitchhiker's Guide to The Galaxy 15.
Sherlock 27.
Beyond Zork *(IIe or IIGs)* or The Zork Trilogy 34.
Intracorp Murder on the Atlantic *(IIe & IIGs)* 24.
Micro League Sports Micro League Baseball 27.
General Manager/Owner Disk 21.
Team Disk 14.
Microprose F-15 Strike Eagle or Silent Service 24.
Silent Service *(IIGs)* or Pirates 27.
Mindscape Defender of the Crown *(IIGs)*, Rocket Ranger or The Three Stooges *(IIGs)* 34.
Infiltrator II or Into the Eagles Nest 24.
Deja Vu *(IIe or IIGs)* 34.
Balance of Power or Super Star Hockey *(IIGs)* 31.
Bad Street Brawler *(IIe or IIGs)* 24.
Super Star Ice Hockey 27.
Gauntlet *(IIe or IIGs)* or Paperboy *(IIe or IIGs)* 27.
Sinbad *(IIGs)*, S.D.I. *(IIGs)* or King of Chicago *(IIGs)* 34.
Indoor Sports, Uridium, or Xevious 21.
PBI Software The Tower Of Myraglen *(IIGs)* or Alien Mind *(IIGs)* 34.
Strategic Conquest II *(IIGs)* or Cavern Cobra *(IIGs)* 31.
Sea Strike *(IIGs)* or Monte Carlo *(IIGs)* 25.
Sierra On-Line Space Quest, Space Quest II or Space Quest *(IIGs)* 34.
Kings Quest I, II, or III *(IIe or IIGs)* 34.
Leisure Suit Larry *(IIe or IIGs)* 27.
Thexder *(IIGs)* 24.
The Black Cauldron 27.
3-D Helicopter Simulation *(IIGs)* or Police Quest *(IIe or IIGs)* 34.
Mother Goose 21.
Simon & Schuster
Star Trek *(Kobayashi Alternative)* 21.
Star Trek *(The Promethean Prophesy)* 27.
Sir-Tech Wizardry or Legacy of Llylgamyn 34.
Return of Werdna 41.
Spectrum Holobyte Gato 12.
Gato *(IIGs)* 25.
Orbiter *(IIGs)*, Wilderness or Dondra 31.
Strategic Simulations Chickamunga 33.
Colonial Conquest, Eternal Dagger, Sons of Liberty or Questron II 27.
Carriers At War 37.
War in the South Pacific 41.
Sublogic Flight Simulator II 39.
Jet 31.
Scenery Disks 1, 2, 3, 4, 5 or 6 16.
Scenery Disks 7 or 11 20.

Utilities & Languages

Absoft
AC/Basic *(16-bit BASIC Compiler for IIGs)* 84.
Beagle Brothers Beagle Compiler 46.
MacroWorks or Pro-Byter 21.
Beagle G.P.L.E. or Super MacroWorks 31.
D-Code, Extra K, Power Print or Triple Dump 25.
Borland Turbo Pascal 3.0 *(Req. CP/M)* 48.
Funk Software Sideways Prodos & Dos 3.3 48.
Roger Wagner SoftSwitch *(IIGs)* 41.
Merlin 8/16 *(IIe, IIc, IIGs)* 79.
The Byte Works ORCA/Pascal *(IIGs)* 72.
ORCA/Pascal Desktop Debugger 80.
ORCA/M GS 39.
ORCA DeskTop 34.
TML Systems TML Basic *(IIGs)* 84.
TML Pascal *(IIGs)* 84.
TML Source Code Library *(IIGs)* 35.
TML Speech Toolkit *(IIGs)* 49.
TML Pascal APW *(IIGs)* 84.
Zedcor ZBasic 4.0 39.

Accessories

Abaton Propoint ADB Turbo Mouse *(IIGs)* 119.
Apple Computer Apple Mouse IIe 125.
Apple Mouse IIc 89.
Applied Engineering TimeMaster H.O. 85.
IBM Style Keyboard or Sonic Blaster 119.
Audio Animator *(IIGs)* 185.
Applied Visions Future Sound Digitizer *(IIGs)* 179.
Asher Engineering Turbo Trackball *(IIe, IIGs)* 69.
CH Products Hayes Flight Stick 52.
Hayes Mach II Joystick *(Beige or Platinum)* 29.
Hayes Mach III Joystick *(Beige or Platinum)* 38.
Curtis Curtis Emerald 36.
Curtis Ruby 55.
Curtis Ruby Plus 60.
Curtis Diamond Plus 40.
Cutting Edge EADB-105 Extended Keyboard *(IIGs)* 139.
DataDesk DataDesk ADB-101 Enhanced Keyboard *(IIGs)* 149.
Kalmar
Teakwood Rolltop Disk Case *(Holds 50)* 18.
Kensington Mouse Pocket *(Reg. or ADB)* 8.
Mouseway *(Mousepad)* 8.
Apple IIGs Dust Cover or Imagewriter I or II Cover 9.
Mouse Cleaning Kit w/Pocket 17.
Disk Drive Cleaning Kit *(3.5" Drives Only)* 20.
Apple Security System 34.
Printer Muffler 80 37.
Printer Muffler 132 51.
Printer Muffler Stand 80 or 132 21.
A/B Box *(IIGs)* 63.
System Saver *(Platinum or Beige)* 69.
System Saver *(IIGs)* 79.
Turbo Mouse *(Reg. or ADB)* 82.
Kraft Universal 3 Button Joystick *(II+ IIe, IIc)* 34.
Koala Technologies
Koala Pad Plus w/Graphics Exhibitor 84.
Kurta IS ADB Tablet w/stylus *(IIGs)* 339.
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Digitizer Professional *(IIGs)* 139.
SuperSonic *(Stereo Card for IIGs)* 52.
SuperSonic Digitizer *(IIGs)* 52.
Mouse Systems A+ Mouse *(IIc)* 67.
A+ ADB Mouse *(IIGs)* 87.
MousTrak MousePad 7"x9" Size 8.
MousePad 9"x11" Size 9.
MousePad L/F *(Low Friction)* 9.
Orange Micro Juice Box *(IIGs Switched Surge Suppressor w/Fan)* 69.
SMT No Slot Clock *(II+ & IIe)* 42.
Street Electronics Cricket IIc 125.
Echo IIb Speech Synthesizer *(II+, IIe, IIGs)* 109.
Summagraphics Bit Pad Plus *(IIGs)* 335.
Ribbons
Available colors: black, blue, brown, green, orange, purple, red, yellow, silver or gold
ImageWriter Ribbon-Color 4.
ImageWriter Ribbon-Black six pack 20.
ImageWriter II - 4 Color Ribbon 9.
ImageWriter Rainbow Pk. (6 Colors) 20.
ImageWriter LQ Black 17.
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Broderbund Geometry *(IIGs)*	68.
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Compu-Teach	
Once Upon A Time	25.
Stepping Stones Level I	25.
Stepping Stones Level II	25.
See the U.S.A.	37.
Davidson & Associates	
Apple II and IIGs Versions Available:	
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Speed Reader II	43.
Spell-It or Word AttackPlus!	31.
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Mathtalk Fractions or First Letters & Words *(All IIGs, each)*	37.
Great Wave Kidstime II *(IIGs)*	24.
SpaceLace	20.
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Reader Rabbit *(IIGs)* or Writing and Publishing Center *(IIe & IIGs)*	41.
Writer Rabbit *(IIGs)*, Think Quick *(IIGs)* or Rockys Boots *(IIGs)*	34.
Magic Spells *(IIGs)* or Math Rabbit	27.
Gertrude's Secrets *(IIGs)*	31.
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Speed Reader Tutor IV *(IIGs)*	34.
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Spinnaker Kindercomp Gold	26.
Homework Helpers Writing or Math *(IIe or IIGs Ver.)*	34.
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Kidwriter	27.
Terrapin Enhanced Terrapin Logo V3.0	69.
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Hayes Hayes Micromodem IIe *(Internal)*	165.
Hayes Smartmodem 1200A *(Internal)*	265.
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Pro Modem 1200 *(External)*	239.
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3M 5.25" SS/DD *(box of 10)*	11.
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Centech 3½" DS/DD Color Disks *(box of 10)*	19.
Sony 3.5" DS/DD *(box of 10)*	18.
Fuji 3.5" DS/DD *(box of 10)*	19.
Maxell 3.5" DS/DD *(box of 10)*	20.
Verbatim DS/DD *(box of 10)*	19.
3M 3.5" DS/DD *(box of 10)*	20.
C. Itoh 3.5" DS/DD Color Disks *(box of 10)*	25.

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M-1109AP *ImageWriter Comp.*	249.
Epson LX-800	219.
FX-86e	369.
FX-286e	449.
EX-1000	499.
LQ-1000	629.
Okidata	
Microline 182P *(120cps Dot Matrix 10")*	275.
Microline 192*Plus (200cps Dot Matrix 10")*	349.
Microline 193*Plus (200cps Dot Matrix 15")*	489.
Panasonic	
KXP-1080 I/M2 *(144 cps)* NLQ Mode	199.
KXP-1091 I/M2 *(192 cps)* NLQ Mode	229.
KXP-1092 I *(240 cps)* NLQ Mode	329.
Seikosha	
Seikosha SP 1000 *(Imagewriter Compatible)*	219.

Disk Drives & Hard Disk SubSystems

American Micro Research *(Micro Sci)*	
A5 D Half Height 5¼" Drive *(IIGs Daisychain)*	165.
A.5 Half Height *(II+ & IIe)*	139.
A.5C Half Height *(IIc)*	139.
Micro Sci C2 Controller	52.
Applied Engineering	
Transdrive 360K	209.
Transdrive Dual 360K	289.
Transdrive Half Height 360K	119.
Central Point Software	
Universal Disk Controller	79.
Central Point 800KB Drive	185.
Universal Disk Controller/800KB Drive Bundle	259.
CMS	
"Compact Series" Beige IIe, IIGs	
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Print Shop Graphics Library Party Edition	24.
Data Transforms Printrix 1.1	46.
Monster Font Pack	21.
Electronic Arts DeluxePaint II *(IIGs)*	69.
DeluxePrint II *(IIGs)*	37.
Video Title Shop Companion Vol 1	30.
Video Title Shop Companion Vol 2	15.
Art Parts I *(IIGs)*, Art Parts II *(IIGs)*, or Seasons & Holidays *(IIGs)*	23.
EPYX Printmagic	41.
Graphics Scrapbook Chapter #1, #2, or #3	17.
Create-A-Calendar	21.
Intracorp Bumper Sticker Maker	34.
Business Card Maker	37.
PBI Software Visualizer *(IIGs)*	56.
Visualizer IIe	52.
Scholastic SuperPrint *(IIGs)*	31.
Spinnaker T-Shirt Shop	34.
T-Shirt Shop Graphics	15.
Springboard Newsroom	39.
Springboard Publisher *(IIe or IIGs)*	84.
Certificate Maker	26.
Certificate Maker Library #1	20.
Fonts For Springboard Publisher *(IIe or IIGs)*	26.
Newsroom Clip Art Collection Vol. 1 or 3	20.
Newsroom Clip Art Collection Vol. 2	26.
Laser Drivers	26.
Style Sheets/Newletters *(IIe or IIGs)*	20.
Works of Art Education, Holidays or Assortment *(IIe or IIGs)*	26.
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Unison World Printmaster Plus	31.
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Art Gallery Fantasy	19.

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Activision Teleworks Plus *(IIGs)*	68.
Checkmate Technology	
ProTERM *(IIGs, IIe, IIc)*	95.
Compuserve Compuserve Starter Kit	24.
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Pinpoint	
Point-To-Point	74.
United Software Industries	
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ASCII: Express Mousetalk	74.

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Finger Print G+ *(With Parallel Cable II+, IIe, IIGs)*	55.

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COVER STORY BY PHILLIP ROBINSON

SWITCHING *between* TWO WORLDS

Most people who are new to computers are puzzled that the same 5¼-inch disk that contains a wealth of information for an Apple II is a blank piece of plastic to an IBM PC. Different program codes, different disk formats, different program interfaces: Why is it all so confusing and scattered? Why can't I run the best software for my needs, regardless of the system that I own? Those are hard questions to answer.

Such incompatibilities become roadblocks even to experienced computer users. Rather than try to deal with the differences between Apples and IBMs, most users prefer to stick with one or the other. The reality, however, is that both types of computers end up vying for the same user's attention—either in a classroom or in a situation in which someone has, say, an IBM clone at work and an Apple II at home.

Thanks to a few recent product introductions, Apple II users can more gracefully switch between these two worlds. Hardware and software engineers have created boards and programs that bridge the world of the PC and the world of the Apple. (For convenience, the term "PC" in the following group of articles refers to IBM PCs and compatibles.) Nowadays, the contenders aren't exactly in their respective corners. There are PC clones that can read both PC and Apple II disks, PCs that can run Apple II programs, Apples that can read PC disks, and Apples that can run PC programs. Although setting up any of these systems may involve some effort, the payoff is that you have access to files and programs from both worlds—and that increases your ability to handle and communicate information.

Of course, the simplest way to have that access is to have multiple systems. I am blessed with a Macintosh II, a PC-compatible, and an Apple IIGS, all on a single desk. There isn't much else on that desk, of course: There's no room left. Nor can I get data files from one system to another unless I send them through a modem or serial cable. I have an army of computing power without any central command or communications.

This issue of *A+* looks at several ways to switch-hit—to have the features of two systems in one:

- The **PC Transporter** is a PC-compatible computer on a single add-in

PHOTOGRAPHY BY CARTER DOW

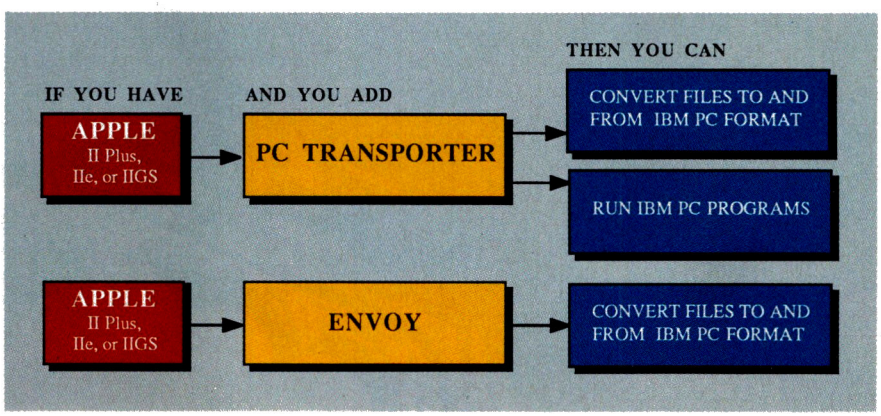
Four products that combine Apple II and IBM PC capabilities

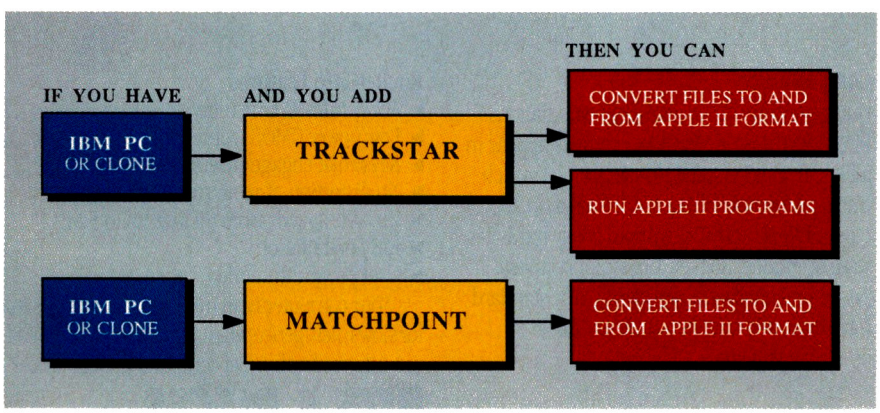
board. Plug it into your Apple II, and you can run PC software and trade files with your Apple.

•The **Envoy** is a PC-compatible disk controller. Plug it into an Apple and attach a PC-compatible floppy-disk drive, and your Apple can read PC disks.

•The **Trackstar** is an Apple II-compatible computer on a single add-in board. Plug it into a PC (or, in the near future, into a PS/2), and you can run Apple software. Cordata's WPC Bridge is a variation on this theme—a PC-compatible that comes with a Trackstar board already in place: It can run both PC and Apple software.

•The **MatchPoint-PC** board is an Apple-compatible disk controller for the PC. Plug that in, and your PC drive can read both PC disks and Apple disks.





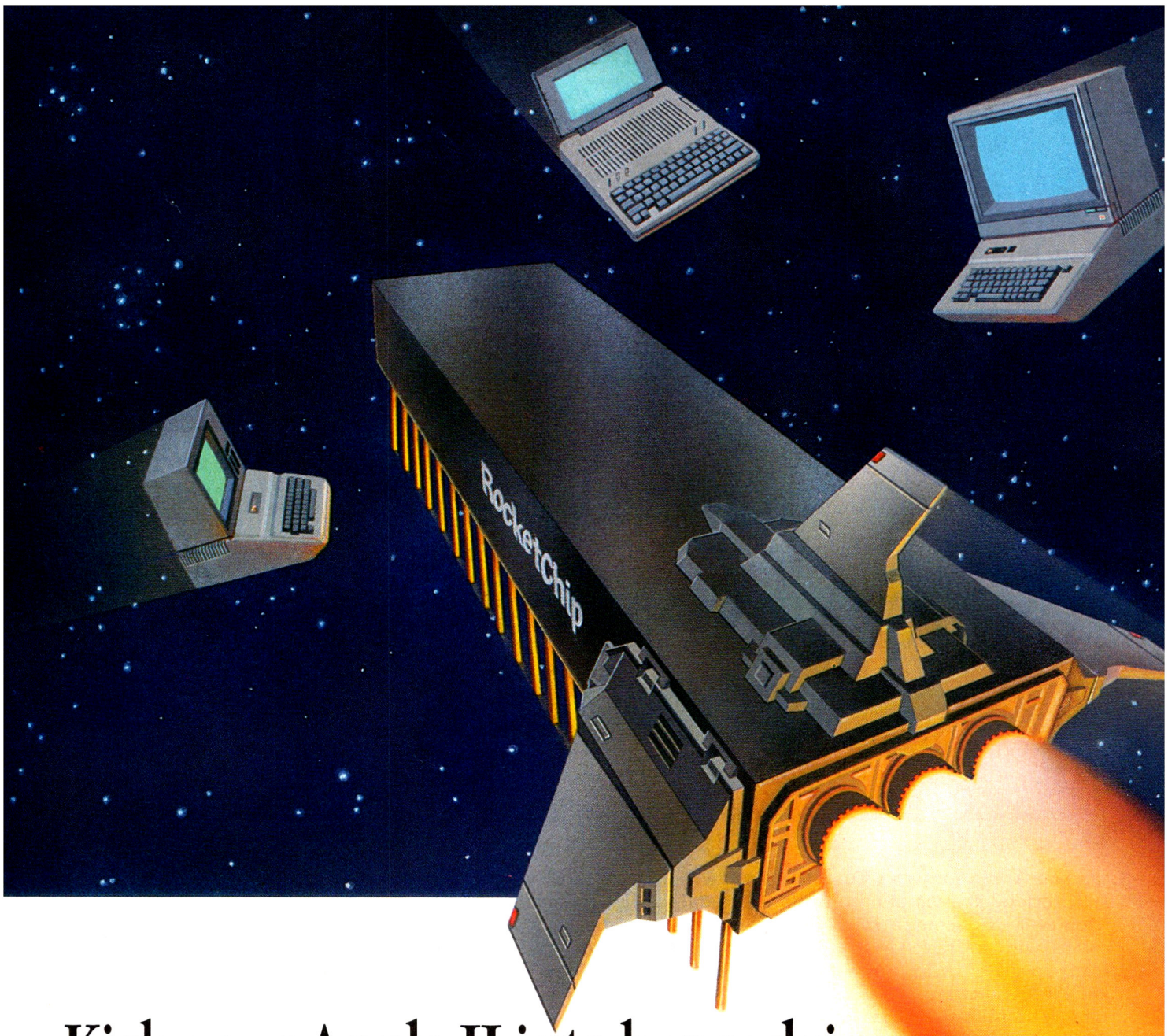
I have to admit that I had a big dollop of skepticism about these crossover products. If I could, I'd be thrilled to have a single computer that embodied all of the traits I like: the IIGS software and graphics, the Mac software and interface, the PC software and expandability. Then I wouldn't have to fit three keyboards onto a single desk, to have so many monitors that my workroom looks like a TV director's studio, to have so many cooling fans running that I can't hear the stereo. But with computer families so different in architecture and abilities, could there really be any substance to the links? Even if they worked, were they practical? Coprocessors are often complex, finicky creatures that aren't 100% compatible and run more slowly than a separate computer system would. What's more, I don't want all sorts of cables running from here to there, driving me nuts with installation difficulties. Nor do I want "enhancements" to my system to bother in any way my current software and hardware.

After testing these systems, I'm back to report that my skepticism has evaporated. At the very least, these products offer fairly painless compatibility with the PC world; for reading other people's files; or for making disks you can send to friends, colleagues, and customers with PCs. If you already have a PC alongside your Apple, get an Envoy (if you work mainly on the Apple side) or a MatchPoint-PC (if you work mainly on the PC side). They're about the same price and have similar features, allowing you to swap files between systems.

If you can afford to spend more, get a Trackstar (if the PC is your main attraction) or a PC Transporter (to center on the Apple) for both data and *program* compatibility. Again, the prices for the base systems are similar, and both offer nearly full compatibility in running programs from the other system. A minimum two-way system looks like the Cordata clone: a plain-vanilla PC with basic Apple compatibility from the Trackstar board. A more expensive, and more powerful, system is a IIGS with a PC Transporter: a top-of-the-line Apple II with a fast PC added to it.

None of these systems will bring you up to the state of the art on both sides. That is, you can't run 286/386-generation software on the PC Transporter, nor can you run IIGS software on the Trackstar. Nor can they be as flexible and completely compatible (both in hardware and software) as separate Apple and IBM computers. They can save your investment in data and programs, save some desk space, stretch the useful life of an older II, and let a IIGS owner say, "Sure, I can run that Lotus file for you, as soon as I finish this game." ✚

Phillip Robinson has written for BYTE, InfoWorld, *and other computer publications, specializing in the MS-DOS world; is the author of several books; and contributes a weekly computer column to the* San Jose Mercury News.



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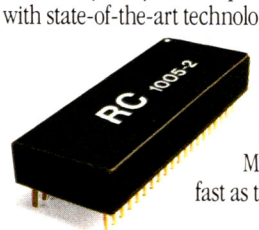

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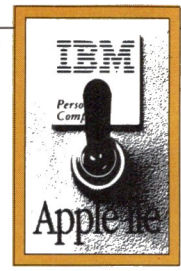


BY PHILLIP ROBINSON

A plug-in card that lets you switch to MS-DOS software on an Apple II

PC TRANSPORTER

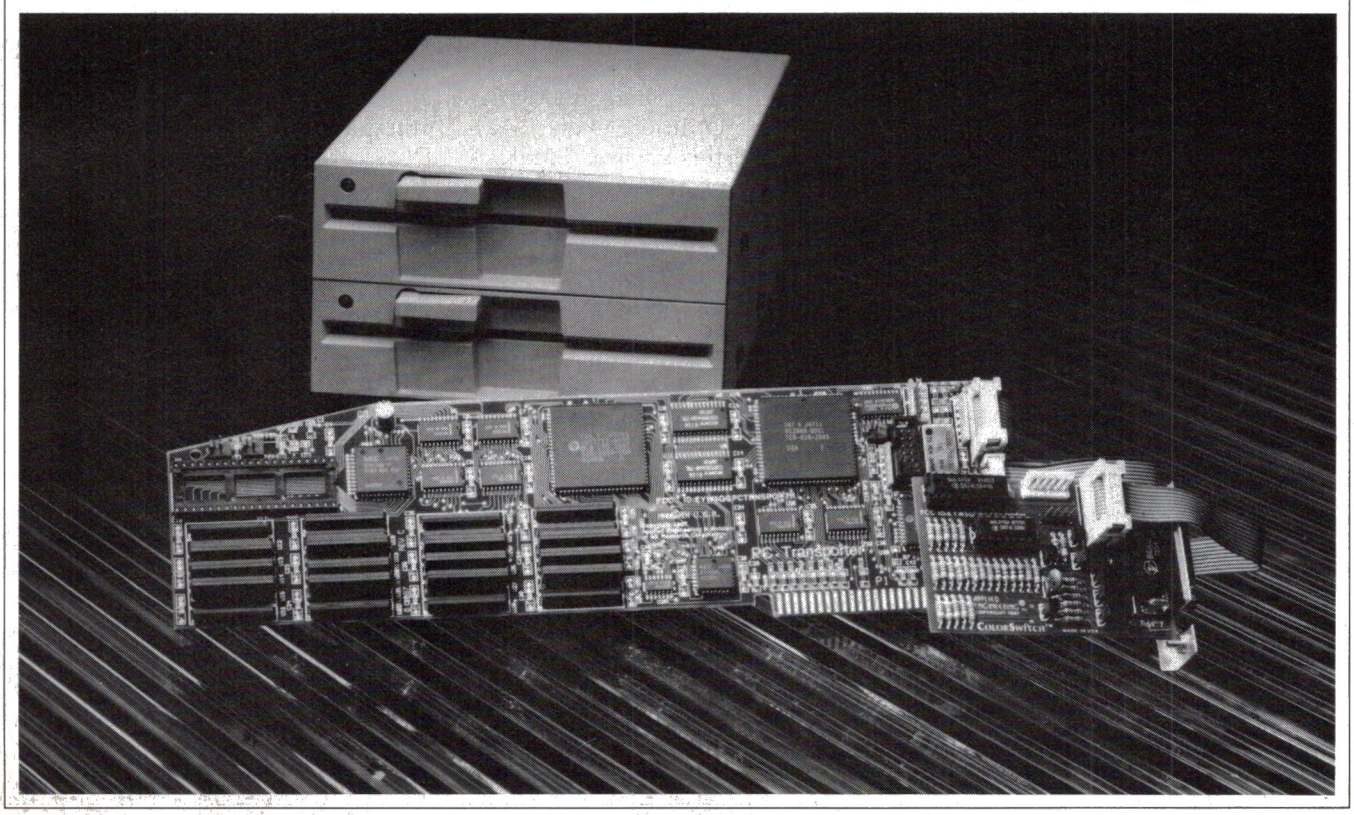
The first time I saw the crude text of IBM's monochrome-display adapter mode appear on my IIGS screen, I laughed. It seemed just plain silly to leap back in time from the GS's graphic interface to the Teletype-style text of the first IBM PC.

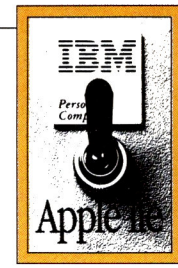
At the same time, though, I was impressed. The folks from The Engineering Department (who designed the PC Transporter card) and Applied Engineering (who are selling and supporting the card) had worked through some awesome technical barriers to get that simple MS-DOS message on the screen. (MS-DOS is the IBM world's standard operating system.) After all, they hadn't just thrown together one more PC compatible from cheap subsystems—CPU board, disk drives, video-adapter card, and MS-DOS. That's so easy to do nowadays that junior colleges and bookstores offer classes in building your own compatible computer.

Instead, The Engineering Department had stuffed an entire PC-compatible onto a single Apple II expansion card, including CPU, RAM, disk controller, I/O emulator, and video adapter. This compact PC doesn't just have to run MS-DOS software—it has to run it while accepting input from an Apple mouse and keyboard and sending output to an Apple video display, serial port, and parallel port. And it does all of that without disturbing the Apple's ability to run plain old Apple software. It even has facilities for translating text files between Apple and PC formats and for storing PC files on Apple disks.

Setting Up

My introduction to the PC Transporter wasn't smooth. I had read John Markoff's article in last September's *A+*, so I knew about the board. I also knew that a standard PC-compatible computer was





available for about the same price as the PC Transporter and a disk drive. (You need at least one PC-compatible disk drive to use the Transporter. If you have a II Plus, you also need a PC-compatible keyboard.) That knowledge made me wonder why anyone would want to stuff PC abilities into their II when they could just have a stand-alone PC instead.

Then, when I received my Transporter, I had trouble installing it. Oh, the instructions were good—a manual full of pictures and diagrams, as well as a VHS videotape of the installation process—but I was confused by the variety of schemes necessary to accommodate the different models of the II. I plugged in one connector upside down, even though the manual assured me there was only one way it would go. (Fortunately, I discovered this mistake before turning the system on.) I wrestled with other connectors that intercepted Apple II signals and fed them through the PC Transporter.

When I called for help from AE's tech-support line, I couldn't get through. Eighteen calls on five different days came up with a busy signal or a ring that no one answered. I have since spoken to another PC Transporter user who got through on the second call, so I'm not sure why I had such a hard time. Whatever the reason, I eventually figured out that I hadn't reset my IIGS's Control Panel slot assignments, and when I made the proper moves there, my PC Transporter came to life. My IIGS was back together, and the only change in appearance was that a dual 5¼-inch floppy-disk-drive system was sitting beside it, underneath my Apple 3.5 drive.

With the PC Transporter installed, Apple software ran just as it had before. When I slipped the PC Transporter disk into the 3.5-inch drive, however, and booted from it or chose its main application, the

The PC Transporter lets you run both Apple and MS-DOS software on a single system, using the same peripherals.

Transporter card woke up, counted its RAM, and looked for an MS-DOS disk in the 5¼-inch floppy drive. I gave it an MS-DOS disk from my PC, and I was up and running. You can jump to a configuration utility at this point by pressing the Caps Lock key twice while holding down the Shift key. From there, you can reboot MS-DOS; boot ProDOS; or reconfigure the Transporter's disk, I/O, and memory settings.

Compatibility

If you stay in MS-DOS, the PC Transporter operates as a standard PC clone. (In my case, the 768K of RAM on the board turned it into a clone with 640K of PC RAM.) Well, not quite standard. All the programs I tried—WordPerfect, WordStar, Lotus 1-2-3, Microsoft Works, the Norton Utilities, even RAM-resident utilities such as SideKick and SuperKey—ran. Applied Engineering admits, however, that certain copy-protected games and telecommunications programs operating at more than 1200 bps do not work.

On the programs I tried out, the displays were crystal clear on the Apple monitor, and the commands to manipulate files and start programs flew without a glitch. Well, they flew after I figured out the keyboard. As you know if you've ever used an IBM PC, many PC programs lean heavily on the *F* function keys, something an Apple keyboard doesn't have. You also use other keys, such as Break, that the Apple doesn't sport—keys that are important on a PC.

You can attach a standard PC-compatible keyboard to the Transporter, but I didn't want to make the switch (on an Apple II Plus, I would have been forced to, though), because I wanted to be able to run Apple software as well as MS-DOS programs.

One of the big advantages of buying a Transporter is the ability to run both types of software—Apple and MS-DOS—on a single system, using the same peripherals and occupying a minimum of desk space. (The 768K of RAM the Transporter can hold automatically becomes a RAMdisk in ProDOS, so you are buying not only PC compatibility but also lots more RAM for your Apple II programs.) So I had to dig through the Transporter manual to find the key equivalents. You can get any PC key or key combination on the Apple keyboard. The manual has explanations of the keys to use and a graphic map that illustrates them. The configuration utility also has an on-screen map that shows the key functions.

Once I knew the keys, I was able to slide around within my MS-DOS programs fairly easily. Printing worked fine—the Transporter automatically converted my MS-DOS printing messages to Apple messages and directed them to a waiting ImageWriter II. Even the Apple mouse was usable, as the Transporter lets you emulate the multiple-button MSC Technologies or Microsoft mice, using certain key combinations along with the Apple mouse.

Performance

To test performance, I ran the PC Labs benchmark tests, which *A+*'s sister publication *PC Magazine* uses to evaluate the speed of IBM and compatible systems. The PC Labs benchmarks showed that Applied Engineering isn't far off the mark when it claims that the Transporter is three times faster than an IBM PC. The actual speed difference depends on the program and the operation. A simple Do Nothing loop

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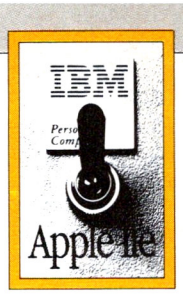


BY NEIL SHAPIRO

PC TRANSPORTER: TIPS FROM AN APPLE EXPERT

I've been reviewing Apple II and Macintosh software for many years. When I first saw an ad for Applied Engineering's PC Transporter, my reaction was, "Who would need that, other than a business with both IBM PCs and Apple computers?"

Then, after a bit more thought, I had myself convinced that I, too, could make use of such a device to turn my Apple IIGS into a PC-compatible computer. After all, a modest amount of software comes out for the IBM PC a little while before the Apple II and/or Macintosh versions debut. In this way, I thought, I might be able to get ahead of the game and be able to see software that I would be reviewing, before it actually became available for Apple machines. So in went my order for a 640K PC Transporter and one of Applied Engineering's IBM-style 5¼-inch disk drives.

In a few days, I was staring at the boxes. Just a few minutes after that, I was watching Applied Engineering's VHS installation videotape. Thanks to the videotape and the step-by-step instructions in the manual, the hardware installation was a breeze. (This is one man's opinion—for another viewpoint on hardware installation, see the accompanying Transporter article by Phillip Robinson.) Putting in the ColorSwitch PC board was the only difficult part of the installation. You have to attach it directly to one of the IIGS's built-in mounting holes. Quarters are tight, and it's simply not that easy to fit large hands back there. But, once the mechanics were out of the way, I just had to plug the Transporter into a slot and connect the cables from the ColorSwitch to the Transporter and monitor. The entire hardware assembly took me less than 20 minutes, not including the time I spent watching the tape.

With a false sense of security, I blithely moved on to the software-installation section. Luckily, I did not have as much trouble getting through to Applied Engineering as Phillip Robinson did, or else my Transporter would still not be running today.

The problem lay in the MS-tifying, MS-erable world of MS-DOS and in trying to understand how to access some of the software that comes with the Transporter. I think that if you have a wide experience with MS-DOS machines, this step is not too difficult. I don't have such experience, and I found it almost impossible to follow the manual's explanation of the ins and outs of installing this software. Do yourself a favor and buy a book on how to use MS-DOS commands.

Here are a few things that were not obvious to me—if you go the Transporter route, perhaps they will save you from having to make as many phone calls to Applied Engineering as I had to.

Do not install your hard disk as "drive C:" until you have completed your software installation. The Transporter allows the Apple's hard disk (in my case a 40Mb Sider) to hold a length-configured file called MSDOSVOL that the Transporter "sees" as drive C:. Incorrectly, I manually configured the Transporter via its Control Panel screen to recognize my Sider and to place an empty MSDOSVOL on it as the Transporter's section of my hard disk.

Big, big, big mistake. What I should have done was to go step by step through the manual and run the automatic configuration first, because the automatic configuration realizes that all the Transporter's MS-DOS files and utilities are preinstalled in an MSDOSVOL file on an included 3.5-inch disk. In other words, the auto-configure program temporarily sets up MSDOSVOL on the included 3.5-inch disk as a "hard disk" or drive C:. By setting up my hard disk as a hard disk before letting the Transporter automatically, and temporarily, set up the 3.5-inch disk as a hard-disk drive, I effectively masked all the Transporter's MS-DOS files from myself! All I could see was that I had a 3.5-inch disk with some ProDOS files, but I could not see the MS-DOS files hidden in the MSDOSVOL area.

Once Applied Engineering's patient support staff got the solution to this problem across to me, things went more quickly. All in all, you can avoid many problems by never getting ahead of yourself in the manual. All the information is in the manual, and anyone but an MS-DOS expert must go step by step or become as lost as I was for a few days.

Does the Transporter work for me? Yes! I have already used it to "prereview" several programs that will shortly be available on the Apple II and/or Mac. It will, I think, have saved me many hours of frantic effort to meet deadlines once those programs appear. I have yet to find any program—business, game, or educational—that I cannot run on this system. With the caveat that you should pay absolute, strict attention to the rather complex manual, I highly recommend the Transporter to those who have a use for such a product. ✚

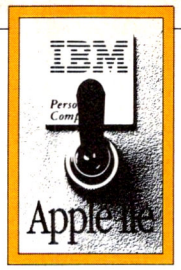
Neil Shapiro, a longtime Apple user, is the sysop of the MAUG section on CompuServe.

was 1.9 times faster on the Transporter than on a 4.77-MHz original-style PC, whereas an Integer Multiply Loop was 3.6 times as fast. Other speed ratios ranged from 2.1 to 2.5 times PC speed, or .4 to .9 times PC-AT speed. (The IBM PC-AT is a high-end model, almost twice as fast as the regular PC.)

Disk tests were also impressive, with the Transporter reading and writing some files in as little as half the time a PC needed. The average CPU improvement was around 2.3 times PC speed—effected mainly because the Transporter uses a NEC V30 chip instead of the slower 8088 in the PC. The ubiquitous Norton Utilities Speed Index test showed the Transporter as having 3.7 times the speed of a standard PC. These performance differences also showed up when I was using application software, but again the improvements were not uniform. In Borland International's Quattro, for instance, I did not see as much speed improvement as I did in Lotus 1-2-3.

Switching Files and Formats

A Transporter utility can translate ASCII files from MS-DOS format to ProDOS format, and the Transporter is able to make a volume on a ProDOS diskette or hard disk for storing MS-DOS files. If you buy a Transporter, you get the ability to move MS-DOS files to the Apple system, and vice versa, so you don't have to also go out and get an Envoy or MatchPoint-PC system (described elsewhere in this set of cover stories) to get disk-file compatibility. You can even have your system read 3.5-inch MS-DOS disks in an Apple 3.5 drive.



Average CPU improvement with PC Transporter was around 2.3 times PC speed.

You cannot read MS-DOS disks in an Apple UniDisk 3.5 disk drive, however. In fact, the manual warns that using a UniDisk can ruin the Transporter hardware. I didn't test this assertion, for obvious reasons.

Pros and Cons

I wasn't laughing anymore when I finished testing the Transporter. I quickly memorized the most common PC-key equivalents and was running many of my MS-DOS programs on the Apple screen. This setup showed several advantages. I did like saving desk space by having both systems in one box, I appreciated the Transporter's doubling or tripling of PC speed, and I made use of the ability to transfer ASCII files from one format to the other. If I were moving to the PC world for the first time, I would also be thrilled to stay in touch with my Apple peripherals. Who wants to have two dot-matrix printers side by side just because they don't speak exactly the same computer language? Not me.

Still, I wasn't convinced that the Transporter was the best way to go if you wanted PC compatibility. This system has some serious disadvantages. If I had been unaccustomed to hardware "enhance-

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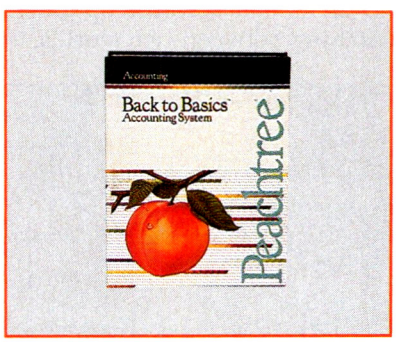

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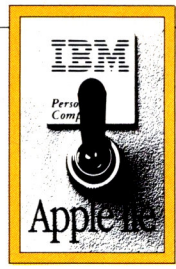

Whatever you do, don't snicker at the coprocessor idea, as I did.

ment" (the art of stringing cables and reconfiguring drivers), the Transporter's variety of configuration options and my difficulty in reaching customer support would have been reason enough to stick to a local "clone" store and a traditional PC-compatible.

Also, as an experienced MS-DOS user, I'm already addicted to the world of high-density 5¼-inch floppies. The Transporter cannot handle them or the new 1.44Mb 3.5-inch floppies. An even more important worry is that I'm used to slots for upgrade processor, memory, and I/O boards. I want to be able to move to 80286 and 80386 chips, add expanded memory, and put in new video-display cards if I need them for CAD or paint programs. The Transporter can accept an 8087 math coprocessor chip but has no provision for add-on boards or processor upgrades.

The standard MS-DOS machine in business today is an AT running at 8, 10, or even 12 MHz. It's not easy to find a PC clone that runs at a mere 4.77 MHz, the speed all Transporter comparisons assume. The Transporter doesn't hold a candle to these machines and doesn't hold out any hope for running OS/2, the multitasking operating system that is just vaporware now but could become important as soon as next year. As far as the display goes, the Transporter's emulation of CGA video is impressive, but EGA is quickly becoming the standard for PCs, and VGA is starting to look like the next standard.

I haven't really come up with *the* advice for all situations. If you want to run only a few MS-DOS programs and don't have expectations beyond CGA displays and original PC speed, the Transporter can give you a compact means for putting those functions on your desk, along with more RAM for your Apple and PC file-transfer capability. If you are already attuned to AT speeds and plan to run some MS-DOS programs for a fair stretch of time, the Transporter may seem a little cramped and plodding. It is also a bit expensive, especially if you start adding up all the peripherals and extras. You'll spend something like $609 for the 640K version, $399 for the dual drives, $49 for an installation kit—or $1057 total (even more if you're working on a II Plus instead of a IIe or IIGS, because you'll need an IBM keyboard). For that money, you can buy a 10-MHz IBM PC-XT-compatible with a 20Mb hard-disk drive that would be almost as fast as the Transporter and would have much greater memory, if a somewhat less impressive display. Of course, that scheme wouldn't buy the extra RAM for an Apple II, and you'd still need to spend a couple hundred for PC/Apple disk-transfer ability.

If you hunger for a speedy PC with expanded memory and great graphics to run big spreadsheets, databases, or CAD programs, and you are already contemplating OS/2, forget the Transporter and buy a cheap AT-compatible. Whatever you do, though, don't snicker at the coprocessor idea, as I did. This PC compatibility is for real and gives you a viable option for switching between two worlds. ✚

VITAL STATISTICS

PC TRANSPORTER
A plug-in card that lets you run MS-DOS (IBM PC) software on an Apple II and its peripherals

CPU: *Apple II Plus, IIe, or IIGS*
OPERATING SYSTEM: *ProDOS and PC-DOS or MS-DOS, Version 2.0 or greater (must be purchased separately)*
DISK DRIVES: *at least one PC-compatible disk drive (5¼- or 3.5-inch)*
OTHER: *PC-compatible keyboard (for use with an Apple II Plus)*
COPY PROTECTION: *no*
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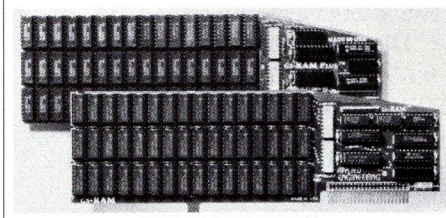

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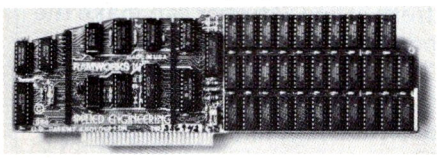

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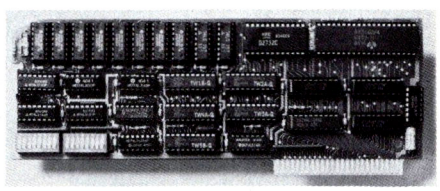

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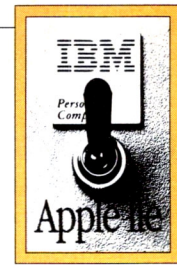


BY PHILLIP ROBINSON

Converting IBM files into Apple format and back again

ENVOY

A funny thing happened on the way to creating disk-drive diagnostic software. Some of the folks at ASKY, a company that makes programs to quickly test a dozen technical aspects of disk-drive performance, decided they'd put their encyclopedic knowledge of disk drives to work on what seemed a minor production quandary. Rather than buy expensive, dedicated disk-duplication machines, ASKY wanted to use inexpensive Apple II computers to duplicate disks for both Apple and IBM systems. So, they created a disk-controller board for the Apple II that could handle PC-compatible floppy-disk drives.

Not realizing how exciting that development would be to people moving from one environment to the other—such as engineers with an IBM at work and an Apple at home—they innocently mentioned the new controller to a users' group. The reaction was potent enough that the firm decided to offer the controller as a commercial product.

Disk-Drive Diplomacy

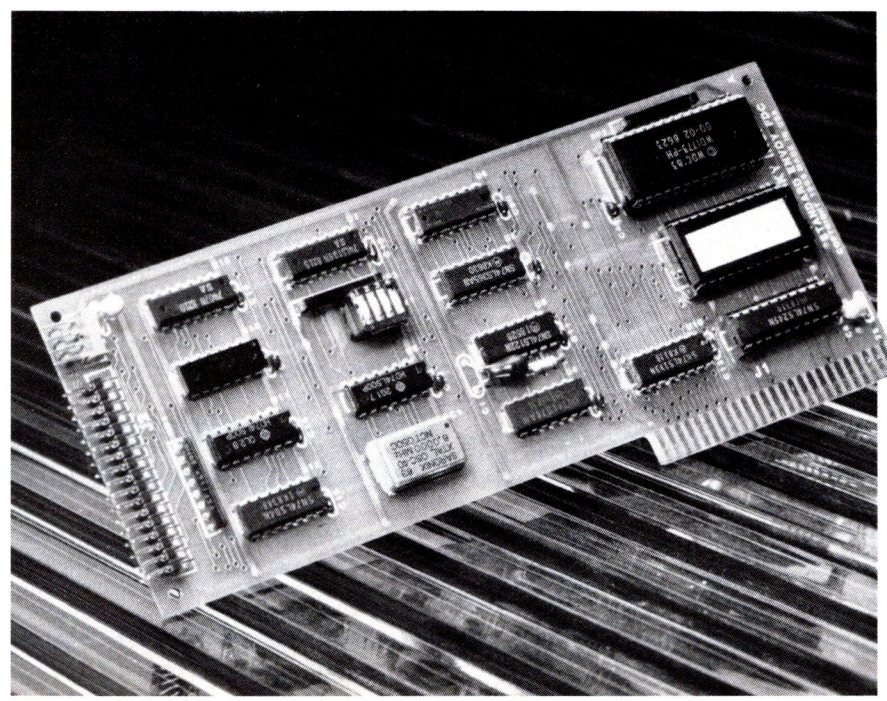
First shipped in late 1986, the Envoy controller plugs into an Apple II Plus, IIe, or IIGS slot and can then handle up to four 5¼- or 3.5-inch PC-compatible disk drives. (It can provide power to only one drive, so if you attach more drives, they must have their own power supplies.) Although it can work with any combination of 360K 5¼-inch drives, 360K 3.5-inch drives, and 720K 3.5-inch drives, it cannot handle high-density 1.2Mb 5¼-inch drives. According to the technical staff, these drives send information faster than the Apple II can swallow it.

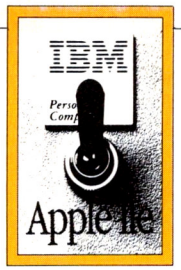
ASKY sells Envoy as a subsystem too—that's what I looked at—that combines the controller card with a PC disk drive, power supply, and cable. Either the card or the subsystem comes with a one-year warranty, and ASKY has a 24-hour technical-support bulletin board as well as a standard technical-support telephone line.

Envoy's software lineup includes ProDOS, BASIC, a setup program, diagnostics (what a surprise!), and a file-transfer program, all on a standard Apple-format disk. These programs let you see what disk drives are available and let you read and write files on PC-format disks. Although you can move PC program files to the Apple, they cannot run on it. For that, you need a coprocessor such as the PC Transporter (see accompanying article). You can display a directory of the files on the disks and move files back and forth between your standard Apple drives and the PC drives connected to the Envoy. A utility called Stripper can make the conversion between MS-DOS ASCII files and Apple ASCII files for translating data from one system to the other. There are no other specific transfer utilities for spreadsheet or database files.

Fringe Benefits

Besides allowing you to read MS-DOS data on your Apple, Envoy gives you a lot of storage space for





Envoy gives you an easy path for moving MS-DOS files to the Apple environment.

Apple files, in that you can use those high-density PC disks for ProDOS file storage. That's a big advantage for anyone with an Apple II but is an especially big smile maker for anyone who's still using the old Apple 143K drives. The Envoy controller is different from the MatchPoint-PC product, which I cover in an accompanying article in this issue, in one regard: It does not read both Apple and MS-DOS format disks in the same drive. Although you can store both types of files on the MS-DOS disks in the Envoy-controlled drives, Envoy cannot read Apple-format disks.

Envoy gives you an easy path for moving MS-DOS files to the Apple environment. If that were its only facet, it would be a nice peripheral, particularly enticing because of its ability to work with the new 3.5-inch MS-DOS drives, but Envoy's ability to cheaply add megabytes of floppy storage to an Apple system—by allowing you to snap in-expensive PC floppy drives onto the Envoy controller cables—is potentially as important as the MS-DOS "connectivity." +

VITAL STATISTICS

ENVOY

Envoy is a PC-disk-drive controller for the Apple II Plus, IIe, and IIgs. It allows you to connect up to four standard PC floppy-disk drives to your Apple computer and then to read and write files on MS-DOS disks.

CPU: *Apple II Plus, IIe, or IIgs*
OPERATING SYSTEM: *ProDOS, Apple Pascal, or Apple DOS 3.3*
LIST PRICE: *Envoy card and utilities, $180; Envoy Sub-System (includes card, floppy-disk drive, power supply, drive chassis, drive cable, and Envoy utilities), $420*

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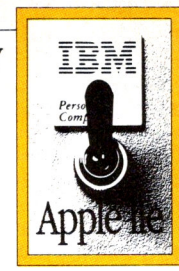


BY PHILLIP ROBINSON

Two ways to switch to Apple II compatibility on a PC or clone

TRACKSTAR 128 *and* CORDATA WPC BRIDGE

If you have a reason to run both PC and Apple II software, you don't have to own two complete systems. Coprocessors can run software from another computer while taking advantage of the disk drives, monitor, and other peripherals of your main computer. One coprocessor option is the PC Transporter card (discussed elsewhere in this issue), which can run PC software on your Apple II. Another option is Diamond Computer Systems' Trackstar board, which performs the opposite task; it runs Apple software on a PC or compatible.

The Trackstar 128 occupies a single slot in a PC and is able to run nearly all Apple II software. It also comes bundled with a PC clone called the Cordata WPC Bridge. Although it boasts a high degree of compatibility with Apple II software, there are a few exceptions: The Trackstar cannot handle programs that employ the special features of the IIGS; it doesn't like telecommunications software; and there are a few other programs that give it indigestion, thanks to their copy-protection schemes. (Your best bet is to check with the manufacturer to ask if your favorite programs will run.)

Installation

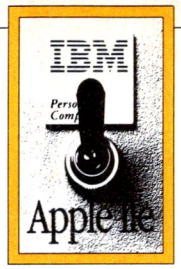
The Trackstar board packs all of the main muscles of an Apple II onto a single board that fits into a standard PC expansion slot. It has a 65C02 CPU, 128K of RAM, an Apple DB-9 game port, and an Apple-compatible disk-drive port. The board comes with all the necessary cables for installation, as well as some software utilities for installation and file transfer. Physically installing the board is fairly simple: You open the PC, plug in the Trackstar, set one jumper on the Trackstar, reroute the video and disk-controller cables through the Trackstar, and close it all up again. If you have TEAC disk drives in your PC-compatible, you need to add a capacitor to them to allow Apple diskettes to boot on the PC. The right capacitors, as well as diagrams and step-by-step instructions on all of this, are in the Trackstar manual. For novice PC enhancers, the manual would profit from the addition of photographs to the diagrams. (I like Applied Engineering's idea of also including a videotape of the installation process with its PC Transporter board.)

Now you're ready for the software side. After starting the PC with MS-DOS, you run the main utility on the Trackstar diskette. It brings up a menu with two choices: normal initialization and high-compatibility initialization. I almost always used normal initialization. The high-compatibility option is for software that needs Apple's own version of Applesoft BASIC—the option asks you for an Apple DOS 3.3 System Master Disk, from which it can read the file called FPBASIC. The normal option has its own FPBASIC emulation program.

The next step is to put the Apple disk from which you want to boot into the appropriate disk drive—drive A or B on the PC or an external Apple drive that you have attached directly to the Trackstar board. The PC drives can read most Apple disks at this point—the only advantage of the external Apple drive is that it can read disks that use the half-track copy-protection scheme.

Running Apple Software

Your Apple program should then start just as if you were booting the disk on an Apple IIe. When I experimented with the Trackstar, I didn't encounter any programs that wouldn't run. AppleWorks, MultiScribe, The Print Shop, and a host of other programs all ran, pre-



senting their work on the PC's display in 40-column, 80-column, low-res, hi-res, double-hi-res, or mixed graphics and text modes. ProDOS, DOS 3.2, DOS 3.3, and Apple Pascal programs seemed to work equally well. Diamond shows a study that says more than 75% of Apple programs run right from the PC's drive, and that 97% run when you use the high-compatibility option and an external Apple drive.

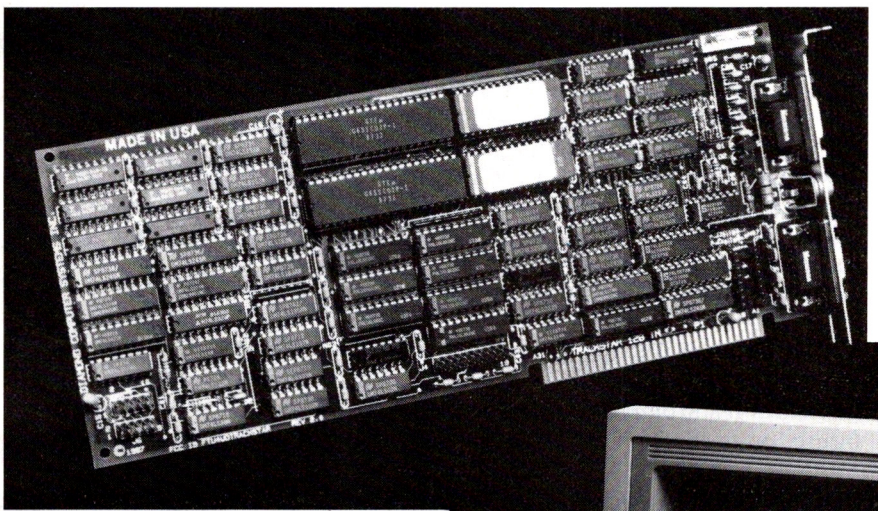
As far as data input is concerned, you can use the PC-compatible's keyboard (some keys are specifically mapped to special Apple keys, such as F9 as the open apple) and a joystick (the Trackstar has a 9-pin game port). Be careful when connecting the joystick: The connector looks just like the digital TTL RGB color output on the Trackstar card. (There's also a Composite Video Out connector on the edge of the board.) Regrettably, Trackstar does not work with a mouse.

For output, Trackstar emulates the standard parallel-printer interface card of an Apple through the printer port of the PC. It also provides a serial interface by emulating Apple serial communication in software and sending the information to and from the PC's serial port. (Unfortunately, most Apple II communications programs don't work with it because they bypass the serial software.)

At any time you can leap back out of an Apple program to MS-DOS. If you press F1 and Esc on the PC's keyboard, a Help Menu appears. From there, you can reboot a disk, reset the entire system, disable the Apple II Plus mode, exit to MS-DOS, or define function keys. That last feature takes advantage of the PC keyboard's F1–F10 function keys. You can assign to them your own definitions, which are then on call as you run Apple programs. When you leave the Trackstar Help menu for MS-DOS, you can choose to terminate Trackstar's software altogether, or you can leave it running in the background. If you keep it in the background, using 40K of the PC's RAM, you can call it up at any time by pressing Alt-Esc.

A separate utility program lets you configure the Trackstar board by setting the type of monitor, serial- and parallel-port ID, and disk-drive assignments. You can choose to boot Apple programs from either of two internal drives or from an external Apple drive. Yet another utility can translate ASCII text or binary files between the DOS 3.3 and MS-DOS formats.

I traveled to Diamond's facility to see the final stages of testing on the Trackstar Plus board. This new add-in card will be able to run in the IBM PS/2 Models 25 and 30;



The Trackstar 128

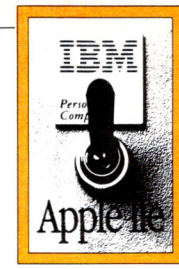
Cordata's WPC Bridge

will store Apple files on PC floppy disks, on a PC's hard disk, or on a PC network; and will have a 2-MHz mode that will give it twice the speed of a standard Apple. The Trackstar Plus will cost $395 and will include an Apple-compatible 5¼-inch disk drive.

A Two-in-One System

The Cordata WPC Bridge can save you the trouble of installing a Trackstar board: It's a PC-compatible computer with a Trackstar board already in place. The WPC combines the monitor and system box in a single enclosure, sort of like a big Mac (with a 12-inch monochrome display). At first I didn't like this design. The keyboard is detached, and the monitor tilts up and down a bit, but you are restricted in positioning and viewing. The compact design also makes insertion of additional boards a bit tricky: The expansion slots are sideways on the left side of the system box and are tucked in pretty tight.

After some experience with the system, though, I appreciated how its rugged construction and simple, one-piece approach would be convenient in a classroom, which is exactly where Cordata is aiming it (with educational discounts). The system comes with two 360K 5¼-inch floppy-disk drives, a monochrome display, a snap cover for the display, 512K of PC RAM, a PC-compatible CPU that can run at



4.77 MHz (standard PC speed) or 8 MHz, a CGA-compatible monochrome adapter (with 16 shades of green), a serial port, a parallel port, an AT-style keyboard, a clock/calendar, three slots, and a Trackstar 128 board. An 8087 math coprocessor and a 20Mb hard disk are optional additions.

I had only two reservations about the Trackstar and WPC. First, they don't accept a mouse, and I'm used to working with a mouse now on my IIGS. Second, they are not compatible with IIGS software. I'm a IIGS user and like the latest, most-graphic programs. If I were looking for a way to combine PC standard application training with traditional Apple education programs, however, the Trackstar would be worth evaluating. I would be very tempted to move to a PS/2 networked environment with the Trackstar Plus to get that higher speed and ability to handle hard-disk drives.

The Cordata WPC is well designed for the market and makes installation simpler, but unless you figure on a hefty education discount, it is overpriced. You would find it cheaper to buy your own PC-compatible and stuff it with a Trackstar. For the price of the undiscounted Cordata system, you could have an IBM PC-AT clone with a much faster processor and a hard-disk drive, plus the Trackstar Apple II compatibility. ✚

VITAL STATISTICS

TRACKSTAR 128

An add-in board for the IBM PC and compatibles that allows those systems to run Apple II Plus, IIe, or IIc software and transfer files between MS-DOS and DOS 3.3.

CPU: *IBM PC or compatible*
RAM: *128K*
DISK DRIVES: *one 360K floppy*
OTHER: *color, composite, or TTL monochrome monitor*
LIST PRICE: *$395*

Diamond Computer Systems, Inc.
470F Lakeside Drive
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(408) 736-2000

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VITAL STATISTICS

CORDATA WPC BRIDGE

A PC-compatible computer that contains a Trackstar board for running Apple II Plus, IIe, and IIc software

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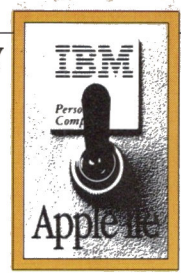
CIRCLE 126 ON READER SERVICE CARD



BY PHILLIP ROBINSON

Reading and writing Apple II files in a PC environment

MATCHPOINT-PC

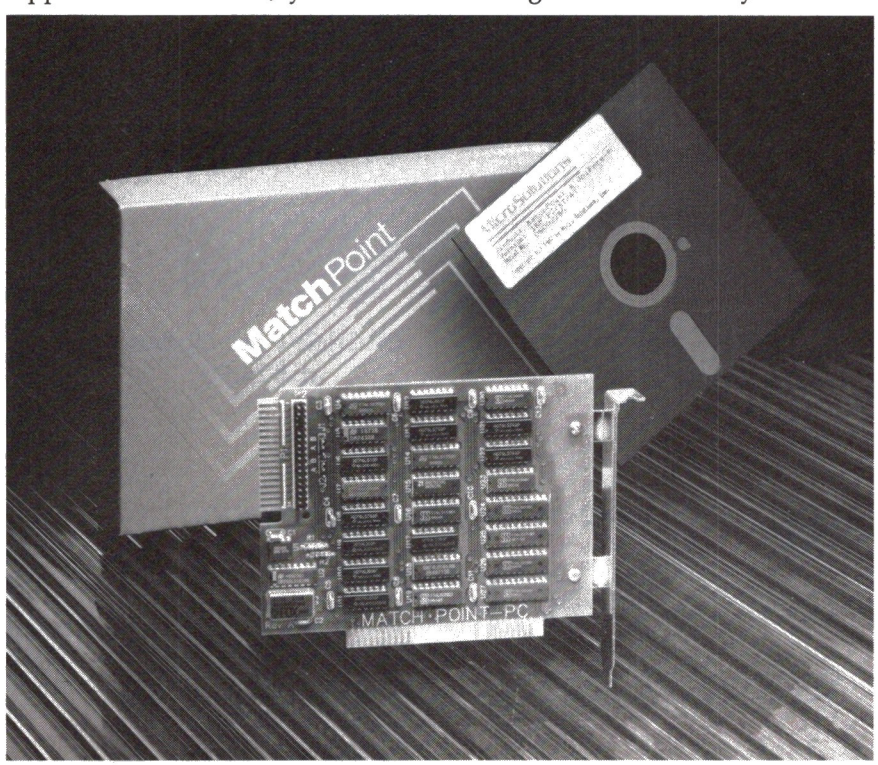
Say you've got application programs on both an Apple II and a PC and need to switch files between the two. Or maybe you've moved permanently from the world of one computer to the other and just want to bring your old files with you. Then all you really need is a way to read and write another disk format on your computer.

MatchPoint-PC is an add-in board for the IBM PC that confers on a PC's disk drive the ability to read and write Apple-format disks. You unplug the cable that connects your PC's floppy-disk drive and its disk controller, plug the MatchPoint-PC board into one of the PC's slots, and plug the PC disk-controller cable into it. Then the MatchPoint board's cable attaches to the disk drive. This connection is very easy to accomplish, even if you know little about computer anatomy. (You have to deal with only two possible connectors and two possible jumper-block positions on the MatchPoint board, and the manual explains them.) Then you close the system up and copy the MatchPoint software onto your system disk (I used an XT clone and a 386-based AT-compatible with a hard-disk drive).

You run the MatchPoint main program, and you're ready to go (this program loads into the PC's memory as a RAM-resident utility, somewhat like Borland International's SideKick does). The first time you run the program, it walks you through a configuration process in which you answer several questions about what kind of disk drive your PC uses and the desired Apple format (DOS 3.3 or ProDOS/SOS). If you have trouble with configuration, installation, or file transfers, you can call MicroSolutions' tech support. I got through to the company on my first call, and the support person answered my question about text-file translation quickly and patiently.

After the installation, you can just ignore the new controller and go about your business. The PC floppy-disk drive still reads from and writes to PC-formatted disks, just as if nothing had changed. But when the time comes that you want to read from or write to an Apple-formatted disk, your PC is ready to please with five new commands: Acopy, Adel, Adir, Ainit, and Atype. They work just like their related MS-DOS commands but are tailored to work with Apple DOS 3.3 and ProDOS disks.

Acopy copies disk files from one drive or directory to another, Atype displays the contents of a file, Adel deletes a file, and Adir displays a directory of a disk. Ainit, for formatting new disks, is the only command whose name doesn't directly match that of its MS-DOS counterpart. Each command has a variety of options for fine-tuning its effect. When working with the commands, you can use regular PC directory and sub-

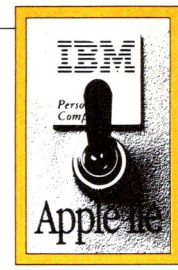


directory commands, but you also need to follow some simple filename conventions that the manual explains—MS-DOS and the Apple operating systems don't have exactly the same rules for naming files. Whether you're handling Apple or MS-DOS files, you can use the standard MS-DOS wild-card characters—such as * and ?—to represent unspecified letters in a filename. The commands do allow you to specify an Apple-disk volume number.

Acopy can specify that an Apple disk file is binary or text. This command can convert IBM ASCII to Apple ASCII and vice versa. You can move binary files to a PC disk but cannot run them on the PC unless you have an Apple II coprocessor board such as the Trackstar board (see "Trackstar 128 and Cordata WPC Bridge" in this issue). Acopy can also specify that a copy of a file is "locked" (read-only).

One Caution

I was able to create text files on both the PC and the Apple II and then read them on the other computer. I also was able to move an ASCII database file from the PC to the AppleWorks database module successfully.



MatchPoint can be an inexpensive and direct way to reach out and touch the Apple II universe.

My only trouble came in trying to write on Apple disks with the high-density floppy-disk drive in the 386-based PC. Doing so corrupted the disk, which was no longer readable in the Apple II or sometimes even in the PC. The manual warns of this trouble, suggesting that you either stick to reading from (and not writing to) disks with such a drive or buy a 360K 5¼-inch drive to add to your AT or compatible if you want to write on Apple disks.

More and more MS-DOS machines have high-density 5¼-inch disk drives and even 3.5-inch floppy drives, so the percentage of computers that can gain Apple II access through MatchPoint is falling. If you do have an MS-DOS system with a 360K drive, however, MatchPoint is an inexpensive and direct way to reach out and touch the Apple II universe. ✚

VITAL STATISTICS

MATCHPOINT-PC

MatchPoint-PC is a disk-controller card and accompanying software that lets an IBM PC 5¼-inch floppy-disk drive read from and write to Apple II-formatted disks as well as standard MS-DOS-formatted disks.

CPU: *IBM PC, XT, AT, or compatible*
RAM: *128K*
DISK DRIVES: *one 5¼-inch 360K drive and one other drive*
OPERATING SYSTEM: *MS-DOS 2 or greater*
COPY PROTECTION: *no*
LIST PRICE: *$195*

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132 West Lincoln Highway
DeKalb, IL 60115
(815) 756-3411

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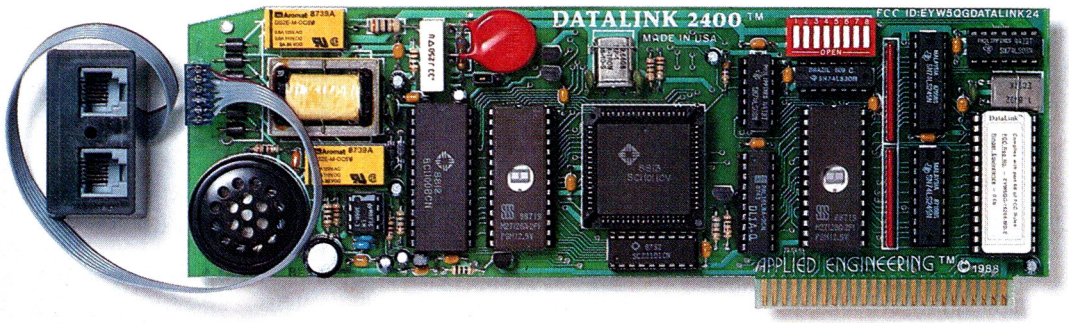
CIRCLE 187 ON READER SERVICE CARD

The new DataLink™ 2400 modem from Applied Engineering, it's a lot more than just twice as fast.



Applied Engineering's new DataLink™ 2400. Simply put, the finest modem on the market for your Apple IIGS, IIe or II+.

Bring home a world of information . . . from up to the minute flight information to whole libraries of resource materials. Even download free software and games.

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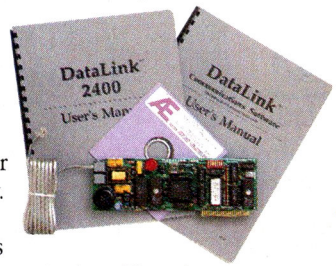

At transmission speeds up to 2400 bps (bits-per-second), Applied Engineering's new DataLink 2400 is capable of putting text on the screen faster than the human eye can follow. That means you can capture a great deal more material in less time than with 1200 bps modems. And *unlike other modems*, the DataLink 2400 comes complete with powerful, easy-to-use communications software.

Complete communications software included.

Both our new DataLink 2400 and our DataLink 1200 modems feature AE's exclusive communications software —on disk and in ROM—everything needed to get you immediately up and running. Our powerful DataTerm software for the IIGS and IIe supports VT-52 screen emulation, macros, file transfers, on-line time display, recording buffer and more. It even stores hundreds of phone numbers for auto-dialing and log on. And for II+ and 64K IIe owners, our OnLine 64 software has many of the same powerful features.

Worldwide compatibility.

The DataLink 2400 is fully compatible with Bell 103 and 212 protocols, as well as European protocol CCITT V.22 BIS, V.22 and V.21. It operates at varying transmission speeds from 0-300, 1200 and 2400 bps.

The new 2400, like our best-selling DataLink™ 1200, carries a full five year warranty and comes complete with two modular phone jacks for data and voice calls, a thoughtful feature that means fewer wires to connect. We also include an extra long telephone cable, in case your computer is across the room from your telephone jack. You can track the progress of calls either electronically or via on-board speaker. And built-in diagnostics reliably check transmission accuracy.

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But if you have an Apple® II personal computer* and a modem, we do have a wonderful new information and communications tool for you.

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In addition to being able to commandeer all this information directly from your keyboard, you'll also

*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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PICK OF THE CROP
BY BOB LINDSTROM

Financial, educational, periodical, programmatical, and conservational products.

PRODUCT SPOTLIGHT

MICROZINE JR.

Although you can't keep the youngsters away from the computer, you can give them something mentally nourishing to use while they're on the keyboard. Scholastic's Microzine Jr. is a computer periodical on disk for ages 6–9. Each two-disk edition of Microzine Jr. provides a solution for parents and educators who want to be responsible yet permissive when it comes to computer use.

The preview edition includes educational games, stories, graphics, and surprises to enhance children's grasp of reading, science, critical thinking, problem solving, language arts, and computer literacy.

Several program modules address a variety of skills and interests. In Where Is Piggy?, children gather and evaluate clues and use logic to locate their pet dog. Storybook Maker allows youngsters to customize a story by making simple choices at various points in the tale.

Computerized flora in the Video Garden grows a little each time a child revisits this program. Eye Spy offers a computer-driven variant on What's Wrong with This Picture?

Microzine Jr. debuts this fall, with a new edition to be released every six weeks. When you are subscribing, be sure to specify whether you want 5¼- or 3.5-inch disks.

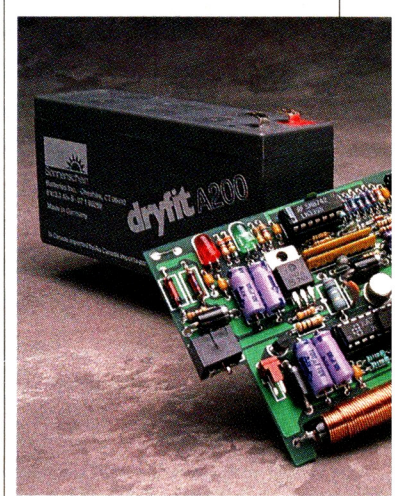
Microzine Jr.
List Price: $169 plus $10 shipping and handling (five-issue subscription)
Requires: Apple IIe, IIc, or IIGs; 64K RAM; one 5¼- or 3.5-inch disk drive. ProDOS, copy-protected.
Scholastic, Inc.
2931 East McCarty Street
P.O. Box 7502
Jefferson City, MO 65102
(800) 325-6149
In MO (800) 392-2179
(314) 636-5271

CIRCLE READER SERVICE NO. **401**

COMPUTER PENNY-PINCHING

One of the most popular financial-management programs for the Apple II series, Andrew Tobias Managing Your Money attempts to simplify such buck-oriented activities as checkbook balancing, budgeting, calculating net worth, determining the need for life insurance, and estimating your income-tax liability.

The program also tracks investments, suggests tax strategies (including ways to deal with the new tax laws), and determines returns on property rentals and tax shelters. Managing Your Money even has a calendar to remind you of important events.



The modular design enables you to use as little or as much of the program as you desire. In most cases, the program reduces complicated financial operations to a series of easy-to-understand questionnaires.

Andrew Tobias Managing Your Money
List Price: $149.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; 80-column monitor; two 5¼- or 3.5-inch disk drives; hard-disk drive recommended. ProDOS; not copy-protected.
MECA Ventures, Inc.
355 Riverside Avenue
Westport, CT 06880
(203) 222-9150

CIRCLE READER SERVICE NO. **402**

A IIGS THAT NEVER FORGETS

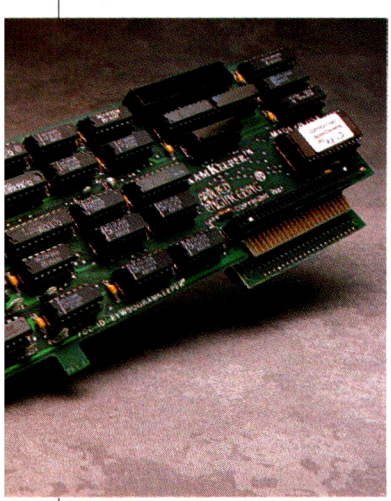
RamKeeper turns any part of your Apple IIGS expansion memory into rechargeable battery-backed-up RAM. In a rather tricky installation procedure, you plug one or two expansion-RAM boards into the RamKeeper, connect an external battery, attach an outboard AC power pack, and plug the RamKeeper into the IIGS memory slot. A configuration program assigns as much or as little RAM as you want to an electronic ROM disk.

But RamKeeper does more.

It can simultaneously access and utilize memory boards from two different manufacturers such as Applied Engineering's GS-RAM and MDIdeas' OctoRAM; it lets you boot from the battery-backed-up ROM disk for virtually instant start-up of the IIGS; it reduces strain on the IIGS's internal power supply; and, of course, it provides a means of storing data and programs in RAM even when IIGS power is turned off.

RamKeeper
List Price: $179
Requires: Apple IIGS; expansion-RAM card; one 3.5-inch disk drive.
Applied Engineering
P.O. Box 5100
Dallas, TX 75011
(214) 241-6060

CIRCLE READER SERVICE NO. **403**



THIS BASIC DOES WINDOWS

TML BASIC provides IIGS programmers the power to create bare-bones text-only applications or advance to elaborate programs that use the full graphic interface of the IIGS.

This 16-bit compiled version of the BASIC programming language operates within the windowing environment of the Apple IIGS. Programmers can edit up to four BASIC programs simultaneously. You can run completed programs directly from memory, using the TML BASIC program disk, or compile them into stand-alone applications under ProDOS 16.

TML Systems claims the program can compile to disk or memory at a rate of more than 6000 lines per minute. A built-in debugger detects run-time errors interactively, and you can use the Check Syntax command to scan a program for BASIC language inconsistencies before compiling.

TML BASIC can handle a wide range of numeric types, including single and double real integer. It also permits access to all the special features of the IIGS Toolbox, including dialog boxes, windows, note synthesizer, sound, fonts, QuickDraw graphics, and printing.

TML BASIC
List Price: $125
Requires: Apple IIGS; 512K RAM; one 3.5-inch disk drive. ProDOS 16; not copy-protected; works with mouse.
TML Systems, Inc.
8837-B Goodbys
Executive Drive
Jacksonville, FL 32217
(904) 636-8592

CIRCLE READER SERVICE NO. **404**

EDUCATIONAL CRIME WAVE

After spreading her felonious fingers over The World and The USA in previous computer edu-tainments, Carmen Sandiego and her crew of thieves have set their sights on the treasures and monuments of Europe.

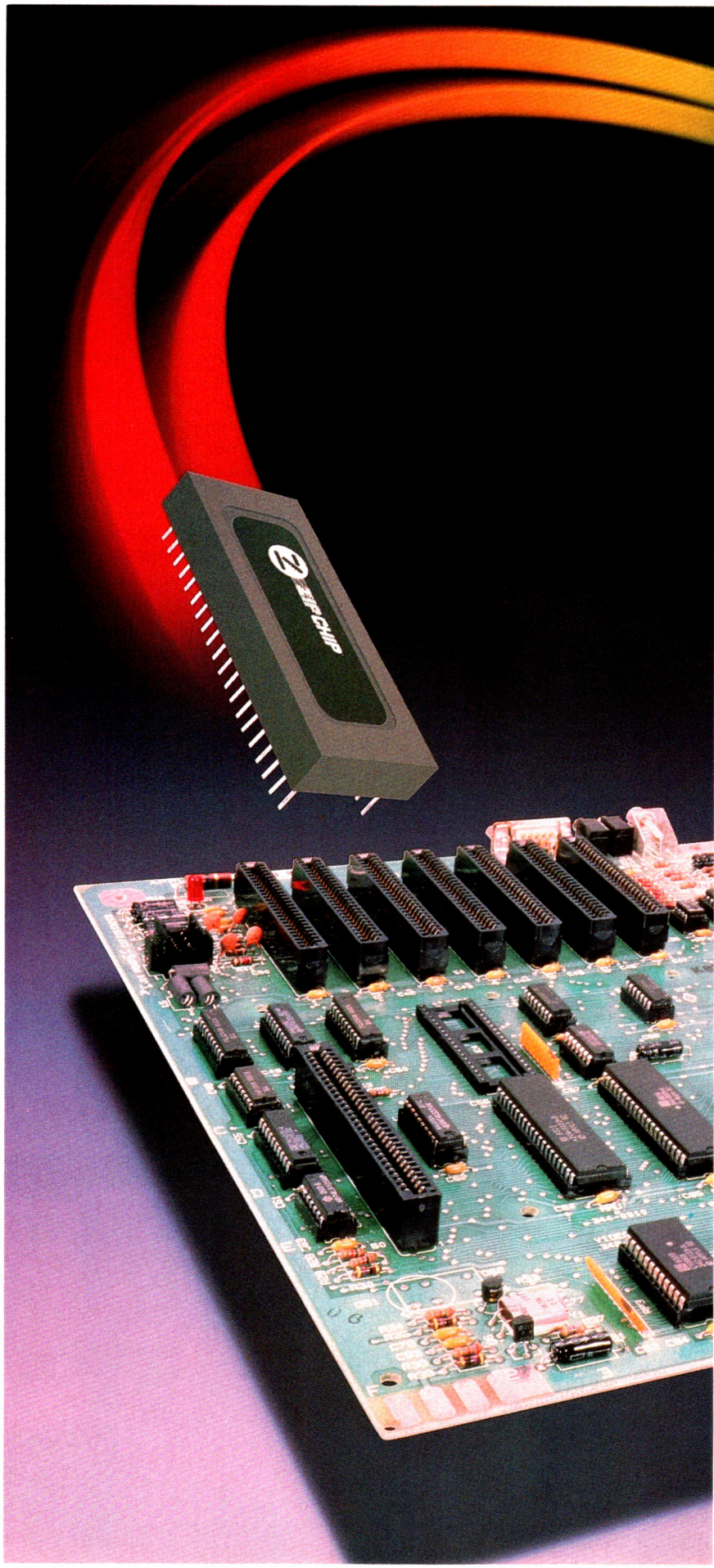
Armed with an included copy of Rand McNally's *Concise Atlas of Europe*, you flip through its pages, deciphering clues you've sleuthed from the Baltic to the English Channel. And if you happen to learn a lot about European geography along the way—well, that's the insidious secret behind Gene Portwood, Lauren Elliott, and Ken Bull's ingenious software design.

With wonderful art and animation, a full measure of that Portwood/Elliott wit, and a new on-line database of European facts, Where in Europe Is Carmen Sandiego? continues to be part of the most entertaining and educational crime wave in computer history.

Where in Europe Is Carmen Sandiego?
List Price: $44.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive. ProDOS; copy-protected.
Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903-2101
(800) 527-6263/(415) 492-3500

CIRCLE READER SERVICE NO. **405**

FOR MORE PRODUCT INFORMATION, SEE "ROUNDUP," PAGE 94.



Zip Chip

The Zip Chip is an accelerator chip that replaces the 65C02 microprocessor in your Apple II with a 65C02 that is capable of running programs at up to four times normal speed. This product is exciting, particularly for IIc users, who have never been able to use accelerator cards designed for the IIe. The Zip Chip also works with the II Plus and IIe but not the IIGS.

Later in this article, I'll explain how the Zip Chip works, but for now let's take a look at what we're most interested in: just how much faster software runs with a Zip Chip installed.

(Throughout this article, the term *Apple II* refers to the Apple II Plus, IIe, and IIc—but not the Apple IIGS. The term 65C02 also refers to the 6502 microprocessor of the Apple II Plus and the original IIe, unless the context indicates otherwise.)

Speed Tests

The accompanying sidebar "Life in the Fast Lane" shows the results of some speed tests I ran with Applesoft BASIC, comparing a normal-speed Apple IIe with (1) the Zip Chip in an Apple IIe, (2) a normal-speed Apple IIe equipped with a TransWarp accelerator card, and (3) a IIGS running at fast speed. In all cases, I timed the operations by using a stopwatch, and I rounded the results to the nearest tenth of a second. The computer carried out

PHOTOGRAPHY BY TOM SKRIVAN

A new accelerator moves your Apple II Plus, IIe, or IIc into the fast lane.

IP CHIP

each of these operations 1000 times in a FOR . . . NEXT loop.

I found the least improvement in operations that did significant text-screen manipulation. Printing a string to the screen improved by a factor of less than 1.3 with the Zip Chip. This result is not too surprising, since the Zip Chip slows down to normal speed to perform memory-writing operations; it accelerates only read operations. The GS does accelerate write operations, so its times are significantly faster.

Just slightly better was the write to disk operation. The speedup was just 1.5 times. By contrast, creating 1000 random numbers showed a speed improvement of 3 times.

Other operations in Applesoft showed speed improvements of 2.6 to 3.5 times. As you can see, some of the best improvements occurred in the low- and high-resolution-graphics operations.

AppleWorks Improvements

The sidebar also shows the results of comparative operations the computer performed with AppleWorks. The word-processing module's Replace operations were more than three times as fast with the Zip Chip. The database sorts were nearly as dramatically faster, although the alphabetic sort was slightly slower than the numeric sort.

I also ran two different AppleWorks spreadsheet operations. In one case, dividing a cell by a constant, the speed improved by a factor of 4, the maximum theoretical improvement with the Zip Chip. The speed for taking an average of seven cells improved by a factor of 3.2.

As you might expect, disk-intensive operations showed less improvement. The Zip Chip did not significantly decrease the time for loading a word-processing document or a spreadsheet. The database, by contrast, loaded 1.5 times faster under Zip Chip, probably a result of the processing that is necessary after you load a data file into AppleWorks.

The Zip Chip is capable of running programs at up to four times normal speed.

Zip vs. TransWarp

The comparison of the Zip Chip with the TransWarp accelerator card is interesting. In AppleWorks operations, the Zip Chip appeared significantly faster in loading a database file and replacing text in a word-processing file. The other time differences in the AppleWorks tests are not significant.

As you can see in the Applesoft tests, the TransWarp is faster in BASIC string manipulation and printing to the Apple II screen. The Zip Chip is faster in disk operations and graphics manipulation, however.

Now that we've confirmed that using a Zip Chip does often result in increased speed, let's see how the chip works.

In a normal Apple II, the microprocessor runs at one megahertz, or 1 million cycles per second. Each operation of the 65C02 takes at least 2 cycles, with a few taking as many as 7. The average instruction takes between 3 and 4 cycles, permitting the 65C02 to perform 250,000 to 333,333 operations per second.

This speed is fast from a human perspective, but many chips run faster. The 8088 in an old-style, plain IBM PC runs at about 4 million cycles per second, the 68000 in a Macintosh SE runs at 7.83 million cycles per second, the Macintosh II's 68020 runs at 15.7 million cycles per second, and even the 65816 in an Apple IIGS runs at 2.8 million cycles per second at fast speed.

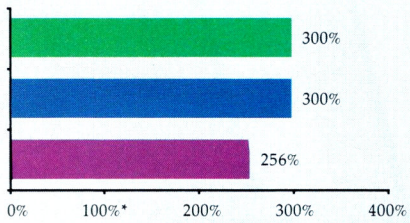
Of course, clock speed isn't everything. The 65C02 is much more efficient in using its cycles than is a 68000 or 8088. Thus, a 65C02 can perform more instructions per second than a 68000 or 8088 running at the same number of cycles per second.

LIFE IN THE FAST LANE

These charts show how fast the Zip Chip, TransWarp, and Apple IIGs (in the fast mode) perform, compared to a standard base: the Apple IIe running at a clock speed of 1 MHz. The percentages indicate the performance of the products relative to the base IIe speed. A value of 100% indicates performance of the benchmark at the same speed as the standard base, 200% indicates a performance two times as fast, and so on. Note that the Applesoft operations were repeated 1000 times in a simple FOR . . . NEXT loop.

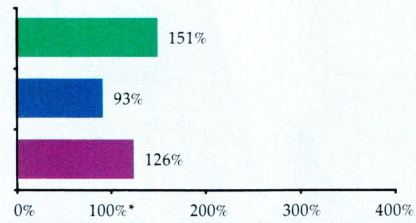
Applesoft Operations

Create 1000 random numbers



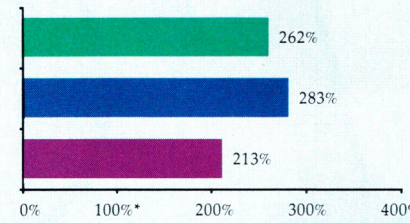
*Base = 6.9 seconds

Write 1000 random numbers to disk



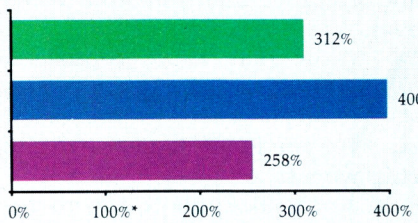
*Base = 22.3 seconds

Convert string to ASCII value



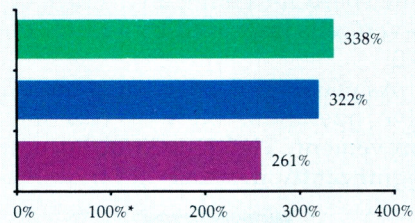
*Base = 3.4 seconds

Create string from numeric value



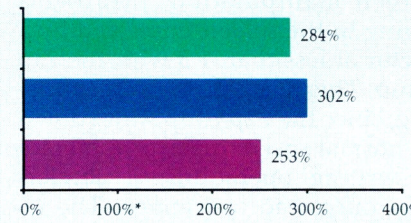
*Base = 10.3 seconds

Perform cosine operation



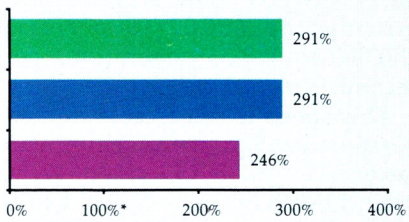
*Base = 27.4 seconds

Assign value to string and perform garbage collection at end



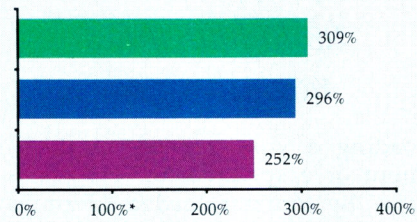
*Base = 13.9 seconds

Perform GOSUB operation



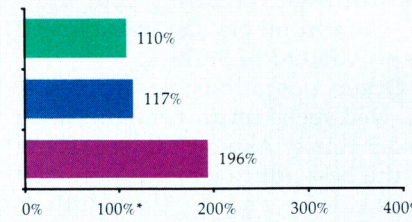
*Base = 3.2 seconds

Poke a value to memory



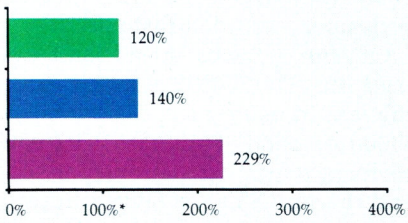
*Base = 6.8 seconds

Home the cursor, 80-column screen



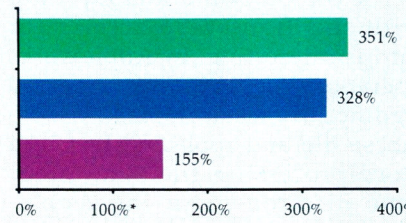
*Base = 35.6 seconds

Print a string to the 80-column screen



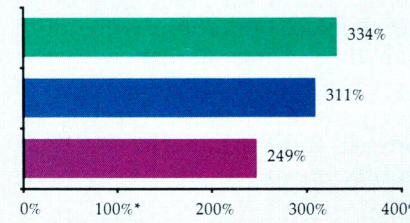
*Base = 40.5 seconds

Draw a square in low-resolution graphics

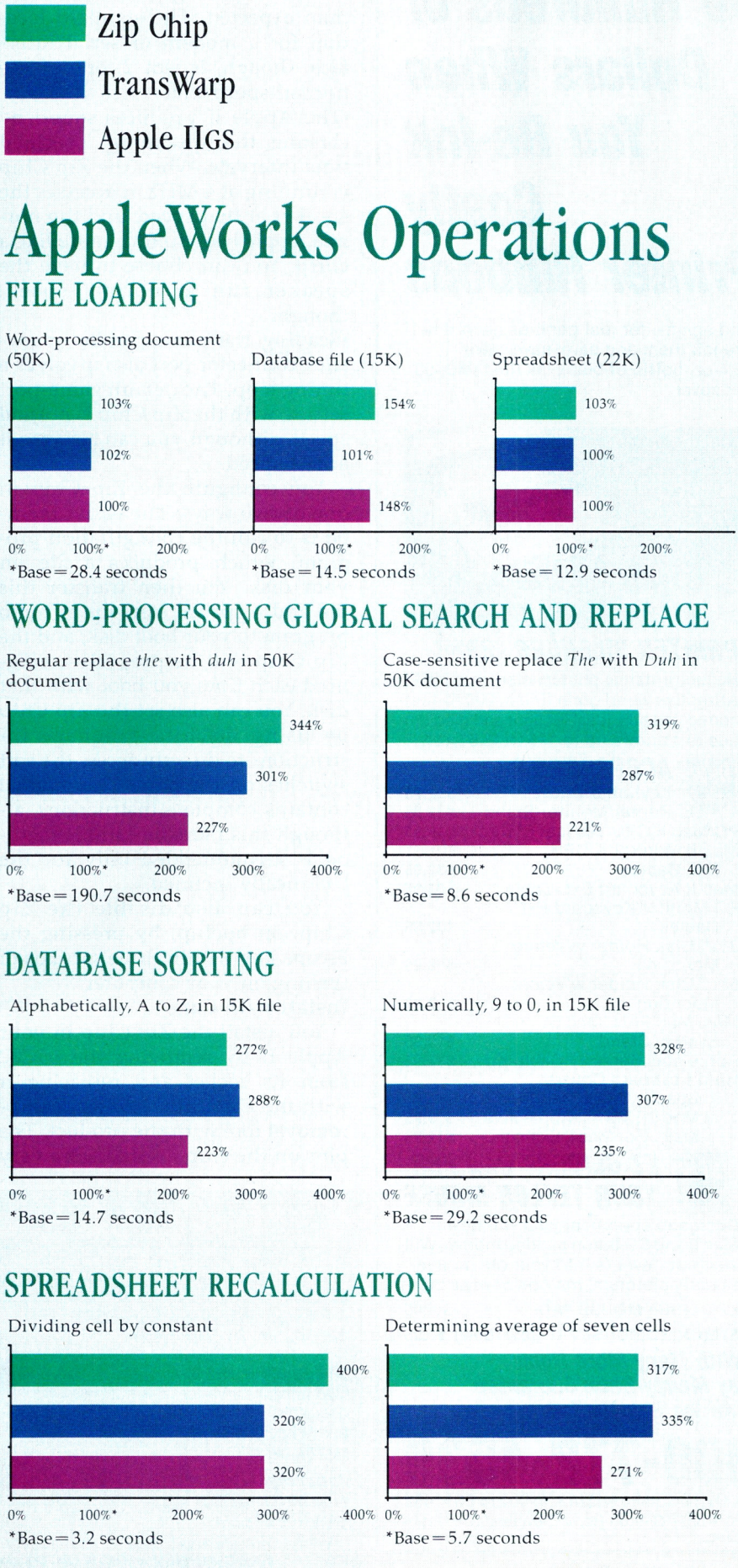


*Base = 213.5 seconds

Draw a square in high-resolution graphics



*Base = 307.4 seconds



The 65C02 in the Zip Chip runs at at top speed of 4 megahertz, or 4 million cycles per second, but this speed is useful only if you are using random-access memory that is fast enough to handle the speed of the chip. RAM may seem to be instantaneous in its operation, but reading a value from or writing it to RAM actually does take a finite amount of time. Unfortunately, faster memory costs considerably more than slower memory.

The Zip Chip has 16 kilobytes of fast memory, called cache memory, built into it, because the standard Apple II memory isn't fast enough for the Zip Chip. As a value is read from main memory at the slower 1-MHz speed, it is stored in the cache memory so that the next time the Zip Chip has to read this value, it can do so from cache memory at its faster speed. Half of the 16K of fast memory in the Zip Chip keeps track of the actual locations of the values in the other half of the fast memory. Write operations always go to regular memory at normal speed.

The Zip Chip actually runs at 18 different speeds, ranging from .667 MHz to 4.0 MHz. The main use you are likely to make of these variations is in arcade-style games. You can play at a slow, easy pace (such as .667 or .750 megahertz); at medium speeds; or up to an almost unplayable 4 megahertz. See the description later in this article of how to configure for various speeds.

Speed Bumps

When you speed up your Apple II, you must be careful about what you speed up and what you keep at normal speed.

•Normal floppy-disk drives must run at 1 MHz. The Zip Chip is preconfigured to run slots 2, 5, 6, and 7 at normal speed and the other slots at fast speed. (Slots 5 and 6 are generally where you put disk controllers for floppy-disk drives on the Apple II.) As long as you have a drive controller in one of those slots, you will be able to boot the Zip Chip configuration disk. Otherwise, you must either move the drive controller to one of those slots or understand how to reconfigure the Zip Chip, using the technical information in the manual.

•Some modems and serial-interface cards depend on timing loops for performing certain functions. If

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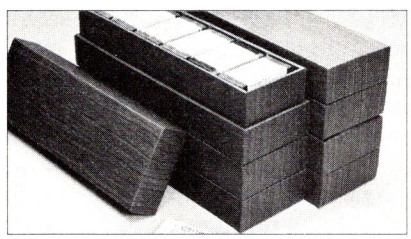

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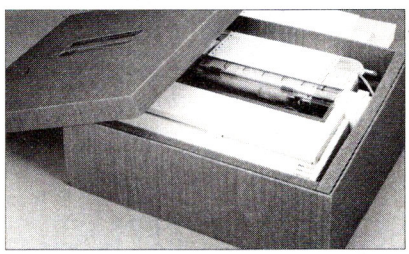

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the slot is running at a faster speed, then, the timing will be shorter than expected. The standard location for a modem or serial interface, though, is slot 2, one of the normal-speed slots.

•The Apple II produces sound by clicking the speaker at specified time intervals. When the Zip Chip is running at 4 MHz, it accesses the speaker at that speed, and the normal Apple beep sounds more like a chirp. You can choose to have the speaker run at normal speed, though.

•Reading the game-paddle or joystick connector port also involves a timing loop. The default game-port setting with the Zip Chip is normal speed, although you can also use it at fast speed.

You configure the Zip Chip in one of two ways: The easier method is to run the configuration program, which produces a file on your disk. You then transfer this file and a special start-up or hello program to your boot disk, and the Zip Chip will be properly configured each time you boot with that disk. You can also set the Zip Chip by using machine-language instructions to directly access the soft switches on the chip. The manual contains complete instructions, although this more ambitious method is recommended only for the technically inclined.

You can also disable the Zip Chip, on bootup, by pressing the Escape key within three seconds of turning on your computer.

Install with Care

You install the Zip Chip in your Apple II by removing the 65C02 from its socket and replacing it with the Zip Chip. You get a chip-removal tool with the product. The pins on the chip I tested were very

VITAL STATISTICS

ZIP CHIP
A replacement chip for the Apple II's 6502/65C02 microprocessor that increases its speed

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DISK DRIVES: *one 5¼-inch (for utility software)*
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Æ Update . . .

Transwarp GS, a new accelerator card for the IIGS was demonstrated by Applied Engineering at the Boston Applefest. The prototype worked flawlessly, speeding up the IIGS to 6 megahertz or about 2.2 times the computer's normal speed. The large prototype card is currently undergoing a redesign by AE engineers to utilize a smaller number of advanced, semi-custom integrated circuits. One tantalizing feature will be an ability to reach even higher performance levels in the future. Currently, 6 megahertz 65C816 microprocessors are the fastest available, but the chip's designers, working closely with engineers at Applied Engineering, promise even faster units in the future. Transwarp GS could be upgraded by simply changing to a faster microprocessor and a faster crystal oscillator as they become available in the future. In fact, Transwarp GS was designed to run at 10 megahertz by changing only these two plug-in components. The current Transwarp Accelerator speeds up the IIe and II+ 3.5 times and is available now for $219.

DataLink 2400, a new 2400 baud internal modem for the IIGS, IIe and II+ is now available from AE. The new modem, priced at $239, features AE's exclusive communications software, worldwide compatibility and more than $200 in free memberships and on-line services. AE's DataLink 1200 baud modem has been reduced to only $179. An upgrade from the 1200 to the 2400 is now available. Call for details.

AE demonstrated two new GS sound products at the Boston Applefest indicating a stronger commitment to Apple-based music, speech and sound effects. In addition, Applied Engineering lowered the price of their Phasor sound and speech synthesizer from $179 to $169 in May. The Phasor is compatible with the IIGS, IIe and II+ and enhances the sound of many commercially available games. Apple owners with only an elementary knowledge of BASIC can write and modify programs to have both speech and sound effects.

RAM chip prices continue to rise. While memory card sales are strong, customers are buying boards populated with less memory than last year. Industry experts disagree on when and if lower prices will return. Applied Engineering suggests buying RAM chips from only those companies that offer a money-back guarantee (as AE does). While the short term price increases seem dramatic, AE's founder vividly recalls paying $600 for a 16K RAM card. So, in perspective, memory is still less that 1/10th the price of several years ago.

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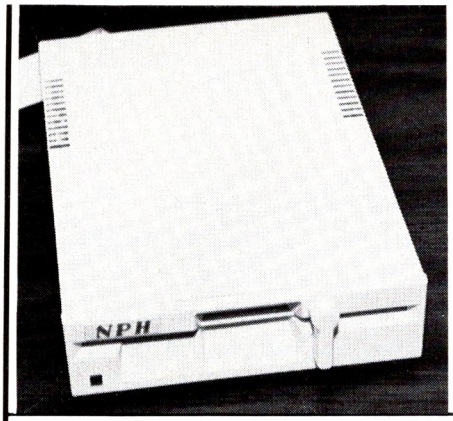

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delicate—although I didn't break them, they seemed to be fragile, so exercise caution in installation.

If you have an Apple IIc, which is not meant to be opened, you will have to take special care. The manual contains good directions on this operation, but it is not a step to be taken lightly.

Using the Zip Chip has two annoying aspects. When you turn on your machine, it stalls for about two seconds before it gives a chirp and boots the disk. Because I first noticed this quirk after I had just installed the chip, I worried that I had bent a pin or otherwise botched the installation. Also, each time you turn off your Zip Chip-equipped Apple II, you must leave the power off for at least five seconds. Zip Technology says that only two seconds is necessary, although my Apple IIe would not operate if I left it off only that long.

Zip vs. TransWarp

If you're examining speedup options for your Apple II, you currently have only two basic options, the Zip Chip and the TransWarp card. The TransWarp card is easier to install. You only need to install the card in a slot in your Apple II Plus or IIe. In contrast, you have to remove the 65C02 chip from your Apple II and insert the Zip Chip in its place.

The Zip Chip works with the IIc as well as the Apple II Plus or IIe. The TransWarp, on the other hand, cannot work with the IIc, and it takes up a slot in the II Plus and IIe. The TransWarp also requires more power and, thus, generates more heat than the Zip Chip does.

As far as performance goes, the TransWarp operates at three different speeds, 1 MHz, 1.7 MHz, and 3.6 MHz, whereas the Zip Chip operates at 18 different speeds up to 4 MHz. As you can see from the tests, however, the two accelerators effectively perform at top speed at just about the same level.

Finally, the Zip Chip comes with 16 kilobytes of fast memory and uses caching techniques to speed up all memory-read operations, including the memory in up to 30 64K banks on an Apple IIe auxiliary-slot card such as the RamWorks III. TransWarp has 256 kilobytes of fast memory, and it speeds up only one extra 64K memory bank.

Of course, the theoretical differences between the two cards are less important than the actual, tested operations. As my tests show, if you use programs that use the text screen intensively, the TransWarp appears to be the faster option. Zip Chip is faster, though, in some AppleWorks operations, certain file operations, and low- and high-resolution graphics. ✚

Michael Fischer's most recent book is Apple IIGS Technical Reference *from Osborne/McGraw-Hill.*

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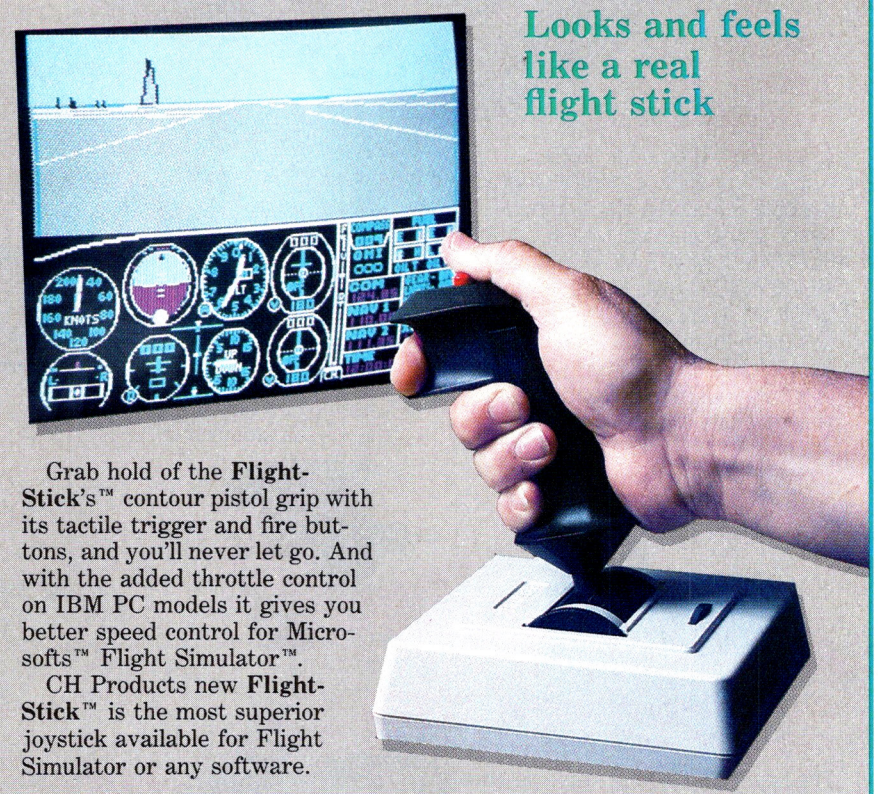

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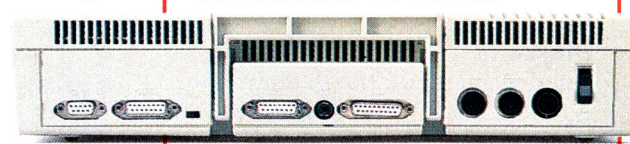

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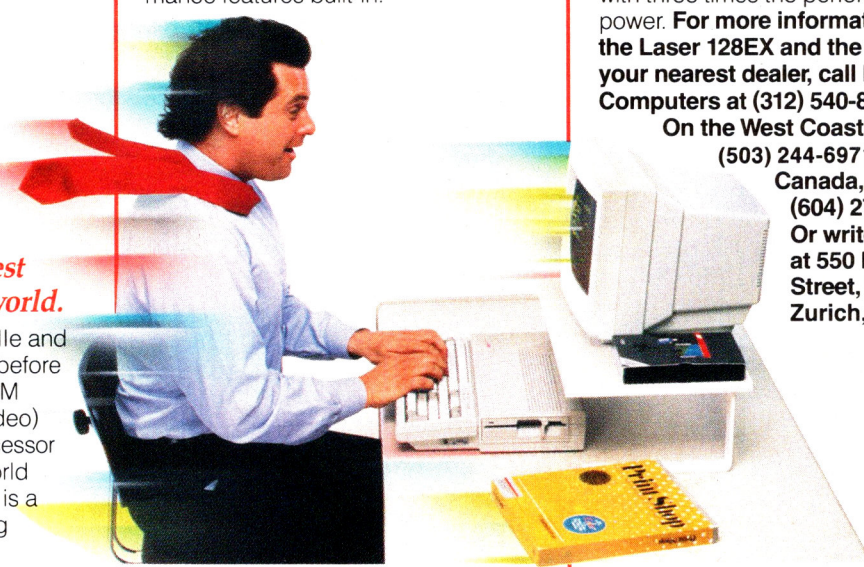

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BY CHARLES RUBIN

APPLEWORKS WITH ADDED RAM

RAM-expansion cards have become extremely popular for AppleWorks users who want to improve AppleWorks' performance, work with larger files on the Desktop, or use an electronic RAMdisk for fast temporary storage. In this article, I present three RAM-expansion options for AppleWorks: the Apple II Memory Expansion Card, the RamWorks III card from Applied Engineering, and the QCard and MultiRam cards from Checkmate Technology. Not meant to be a comprehensive examination of all memory-expansion products, this article attempts only to give an overview of several representative options. Rather than simply discussing kilobytes, prices, and general features, I take a close look at what it's like to use these RAM-expansion cards with AppleWorks.

I did this comparison with an enhanced Apple IIe; note, however, that Applied Engineering, Checkmate Technology, and Apple also make add-in RAM cards for the IIc and IIGS. The RamWorks and MultiRam Plus cards I used incorporate 80-column video output and plug into the IIe's auxiliary slot, whereas Apple's card fits into any slot from 1 to 7. Applied Engineering also makes a slot-1–7 card, called the RamFactor, that works like Apple's card but can be expanded to 5Mb, has a battery-backup option, and is GS-compatible.

Three Uses for RAM

AppleWorks users benefit from extra RAM in three ways. One advantage is an expanded Desktop. All the RAM-expansion cards you can buy today come with software that lets you increase the size of the AppleWorks Desktop from its normal 55K to more than 2Mb in some cases. An expanded Desktop means the possibility of larger files. RAM cards also increase the maximum file sizes in AppleWorks. Word-processing files, for example, have a normal limit of 2,250 lines, but with a RAM card this limit increases up to as many as 22,600 lines. Database files also increase in size with a RAM card. One consideration with larger file sizes is that, particularly with 5¼-inch disk systems, you can easily create individual files that require more space than what is available on the floppy on which you store them. As you'll see, Apple and the third-party vendors have different solutions to this problem.

Another reason to have extra RAM is to run the entire AppleWorks program from RAM, instead of loading segments from disk. Normally when you use AppleWorks, the program must retrieve extra instructions from the program disk when you switch from one application to another, when you load certain menus, or when you change printer specifications. If AppleWorks is running from a disk, you must wait for the disk access when additional program segments are needed, but if the program is running from RAM, the extra program segments are available almost instantly. Again, Apple and the other vendors have different ways of allowing you to run AppleWorks from RAM.

The other reason to use RAM is to have an electronic RAMdisk for storage. A RAMdisk is a storage device, just like a floppy, where you can save or retrieve files by name. When you use a RAMdisk with AppleWorks, you have an additional choice in storage locations (called /RAM or something similar), along with drive 1 and drive 2. With a RAMdisk, you can load and save files much more quickly than you can from disk, which is particularly convenient when you're converting a database file to a DIF file and then making a spreadsheet file from it—faster access to the file speeds up the conversion process.

RAMdisks are typically only temporary storage. Unless you

back them up with a battery, they lose their stored information when you turn off your system. Each of the products in this article has a different way of handling the RAMdisk feature.

Apple II Memory Expansion Card

This card from Apple Computer, Inc. retails with 256K of RAM, and you can buy additional RAM chips to upgrade it to 1Mb. The card I tested contained 512K of RAM and carried a 90-day warranty.

As with the rest of its products, Apple Computer has stressed ease of use with this memory card. You just plug the card into any open slot from 1 through 7, and that's it. AppleWorks and all other ProDOS application programs recognize the card as a volume with the name /RAMn, where *n* = *slot #*. You can store files or the AppleWorks program on the card, using it as a RAMdisk. In addition, AppleWorks version 2.0 and later versions automatically gain expanded Desktop space with an Apple II Memory Expansion Card. The new Desktop limit with a 512K card is 504K. Word-processing files can contain up to 7,250 lines, and database files can contain up to 6,350 records.

With Apple's card, you get the expanded Desktop and access to the RAM as an electronic disk without any effort other than installing the card itself. If you store the AppleWorks program on the card, the program runs from RAM, and you don't have to wait for disk access when you switch applications or access certain menus. Since the Apple card is nothing more than a RAMdisk, however, you can manually copy the AppleWorks program to the RAMdisk whenever you want to run it from RAM—if you enter and exit from AppleWorks several times during the course of a day. (Otherwise, the increase in access speed is not worth the bother of copying files to the RAMdisk.) To do so, you use the Filer or another copy program and copy the AppleWorks program and startup disks to the RAMdisk—a two-minute process.

If you're a user of the Pinpoint Desktop Accessories, the Apple card makes life a little easier with them, too. Pinpoint observes Apple's conventions for extra RAM, and the Desktop Accessories automatically load themselves onto the Apple RAM card when you first boot AppleWorks. With the accessories on a RAMdisk, you'll have quicker access to them.

Apple's card doesn't make any provisions for files you may create that are larger than the floppy disk on which you'll store them. Apple apparently assumes that most people will be using either a UniDisk 3.5 or a hard-disk drive as a storage device, so large files won't be a problem. If you're using 5¼-inch floppy-disk drives, however, you won't be able to store files larger than 136K on a freshly formatted floppy disk.

The best things about the Apple card are the simplicity of installation and the ability to use the RAM either for expanded Desktop space or as a RAMdisk automatically.

RamWorks III Card

The RamWorks card (in an earlier incarnation called the MemoryMaster) was the card that started it all for AppleWorks RAM expansion. Over the past couple years, the card has been constantly refined and upgraded. The latest version, RamWorks III, offers 80-column video output as well as extra RAM and is available with 64K to 1Mb of RAM on the main card.

VITAL STATISTICS

APPLE II MEMORY EXPANSION CARD

Quick and easy, this RAM-expansion card gives you a bigger Desktop, transparent access to a RAMdisk, and the ability to run AppleWorks from RAM if you copy it there manually.

CPU: *Apple II Plus, IIe, or IIgs*
OPERATING SYSTEM: *ProDOS, DOS 3.3, or Pascal 1.3*
LIST PRICE (ESTIMATE): *$229 (256K); Memory Expansion Kit (256K), $69*

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010

AppleWorks Expansion Features

	Unexpanded	RamWorks III	QCard with MultiRAM Plus	Apple II Memory Expansion
Versions		1.0–2.0	1.2,1.3,2.0	2.0
Disk modification required		Yes	Yes	No
Autoloads AW on boot-up		Yes	Yes	Yes
Segments large files		Yes	Yes	No
Has time/date display		Yes	Yes[2]	No
Has print buffer		Yes	No	No
Expansion limits:				
Desktop (kilobytes)	55	3,017	3,223	980[3]
Clipboard (lines)	250	2,042	No expansion	No expansion
Word processor (lines)	2,250	22,600[1]	4,850	7,250
Database (records)	1,350	22,600[1]	23,000	6,350

1. Maximum of 15,300 with v1.0–1.3 **2.** May obscure information at times **3.** Desktop also expanded in v1.3

(Piggyback cards that clip onto the back of the RamWorks card can add up to 15Mb of extra memory.) The card I tested contained 512K of RAM. The RamWorks card comes with a five-year warranty.

The RamWorks card installs in the Apple IIe's auxiliary slot, replacing your existing 80-column card. After the physical installation, however, you have to use Applied Engineering's Super Desktop Expander software for modifying AppleWorks so it recognizes the extra RAM. First you run the Desktop Expander software and then make some choices about whether you want AppleWorks to load automatically onto the RAM card when you boot it each time, if you want to use part of the RAM as a printer buffer, and if you want the current time and date displayed on the AppleWorks screen. (The latter selection requires that you have a ProDOS clock installed in your system.) You also select the maximum number of records you want database files to contain. The default number of records is 500, and as you increase the maximum number of records, the amount of available Desktop space drops slightly. (You can see the Desktop size drop by watching the Space Available indicator in the lower right corner of the screen as you change the database limits.)

After you make your selections on the Desktop Expander screen, you insert copies of your AppleWorks start-up and program disks. The Desktop Expander program modifies the AppleWorks disks so the program's Desktop and file-size limits are expanded. Once you've made the modification, and assuming you've chosen the autoload option, AppleWorks automatically loads into the extra RAM when you boot it. With AppleWorks loaded in RAM, you have 354K available for Desktop files on the 512K card. The Desktop Expander increases AppleWorks' capacities to 22,600 lines in the word-processing module, 22,600 records in the database module, and 2,042 lines on the Clipboard when you're using the word-processing and database modules. The Desktop itself can be as large as 3,017K (assuming you have enough RAM installed).

At this point, you have a system that automatically loads AppleWorks into RAM for faster operation and gives you 354K of Desktop space for creating AppleWorks files. The Desktop Expander software solves the large-file problem by segmenting files automatically across multiple disks. If you try to save a 160K file onto a 5¼-inch disk, for example, AppleWorks will save as much of the file as possible onto one disk and then prompt you to insert a second disk so it can save the balance of the file.

If you've chosen the print-buffer option, AppleWorks will spool printed files to RAM, so you don't have to wait for an entire file to print before regaining the use of your system.

If your system has a ProDOS clock and you've selected the time-display option, AppleWorks will display the time and date (in either 12- or 24-hour formats) in the lower right corner of the screen. With the time-display option, you also get the ability to insert the current time or date into a database record by typing @ in a field whose name contains the word *time* or *date*.

You can disable the printer buffer, time display, and auto-load functions at any time by accessing a menu during the AppleWorks start-up process. Thus, you don't have to run the Desktop Expander software and modify your AppleWorks disks all over again if you change your mind about certain options.

AppleWorks doesn't automatically recognize the RamWorks card as a ProDOS storage device, and if you want to use it as a RAMdisk,

VITAL STATISTICS

RAMWORKS III CARD

A RAM-expansion card that is oriented toward AppleWorks users, assuming that they will trade ease of installation for a huge range of options.

CPU: *Apple IIe*
OPERATING SYSTEM: *ProDOS or DOS 3.3*
LIST PRICE (ESTIMATE): *$179 (64K), $199 (256K), $259 (512K), $379 (1,024K)*

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you must run an Applied Engineering program called ProDrive, which comes with other utility programs on the back of the Super Desktop Expander disk. The ProDrive program causes the Apple IIe to recognize the RAM on the card as a disk drive. You can further modify your AppleWorks start-up disk to create a RAMdisk by automatically running ProDrive. Using a program called Partition, you can allocate the RAM on the card to space for the AppleWorks program, space for an expanded Desktop, and space for a RAMdisk. This program also modifies the AppleWorks start-up disk, so once you have run the program, you can boot AppleWorks as you normally would and have the RAMdisk enabled automatically.

You've probably noticed that RamWorks requires a lot of AppleWorks disk modification. Although these modifications do give you automated access to AppleWorks in RAM, a larger Desktop, and the use of a RAMdisk, they can also be tricky. Other programs such as Pinpoint Desktop Accessories, AutoWorks, MacroWorks, and KeyPlayer also modify the AppleWorks disks, and you must be very careful about the order in which you perform these modifications if AppleWorks is to continue functioning properly. Some of these programs, such as AutoWorks and the Pinpoint Accessories, are incompatible with each other and can't coexist on the same copy of the AppleWorks program. Unlike the Apple II Memory Expansion Card, the RamWorks card doesn't automatically load the Pinpoint Accessories when you boot a copy of AppleWorks that has been modified with Pinpoint.

Although it isn't as simple to use as the Apple card, RamWorks offers several added features at a lower price.

The RamWorks card comes with a 44-page manual, and you'll probably need it if you want to take full advantage of the card for storing AppleWorks, expanding the Desktop, and using a RAMdisk at the same time. If you're interested only in running AppleWorks from RAM and having a larger Desktop, the one modification you must make to the AppleWorks disks is fairly simple—the procedure takes about five minutes. So, although it isn't as simple to use as the Apple card, RamWorks offers several added features at a lower price.

Checkmate QCard/ MultiRam Plus

The MultiRam configuration I tested included a QCard, which provides 80-column video and 256K of RAM, and a piggyback

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MultiRam Plus card that plugs into the back of it, adding 768K of RAM, for a total of 1,024K. The two cards come in separate packages. You plug them together before inserting the whole setup into the IIe's auxiliary slot. Both the MultiRam and the QCard come with a five-year warranty.

Once you've installed the card, you run Checkmate's MultiRam software, which modifies AppleWorks to recognize the extra RAM, allows it to automatically load onto the card, and expands the program's file size and Desktop limits. The procedure is much the same as what I described for the RamWorks card. The flip side of the MultiRam disk contains utilities for creating a RAMdisk with the card or allowing a RAMdisk to coexist with the AppleWorks program and an expanded Desktop, and it also contains Apple's Filer program, which lets you perform file- and volume-management functions.

Using the MultiRam software, you can expand AppleWorks' limits to 23,000 database records, 4,850 word-processing lines, and a Desktop as large as 3,223K. Unlike Applied Engineering's product, however, the Checkmate software does not expand the size of the AppleWorks Clipboard. As with the Desktop Expander software, you can set the number of records you want a database file to contain, and setting a higher limit reduces the amount of RAM you have available. Checkmate's manual contains a chart that shows how the available Desktop decreases as you increase the maximum number of database records.

The QCard/MultiRam combination tries to be everything for everybody.

As with Applied Engineering's software, the MultiRam software lets you segment large files across multiple disks and display the time and date on the screen if you have a ProDOS clock installed. Unlike the RamWorks system, however, the MultiRam software displays the time and date in the upper right corner of the screen. In this location, the display overwrites spreadsheet column labels at the right side of the screen. The MultiRam manual suggests a three-key command you can use to toggle the time display on and off if it interferes with your work.

If you want to use part of the MultiRam's memory as a RAMdisk as well as store the AppleWorks program and increase the Desktop's size, you must create a special boot disk that configures the software and RAM. The procedure is more complex than it is for the RamWorks card, but Checkmate's 188-page MultiRam manual offers step-by-step instructions, and the boot disk you create can automati-

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cally load AppleWorks as well as the Pinpoint Desktop Accessories into RAM when you run it.

The Checkmate manual goes way beyond mere installation and basic use. It offers lengthy explanations of how the Apple uses RAM, how to use RAMdisks, and how to manage large AppleWorks word-processing, database, and spreadsheet files. It contains step-by-step instructions for using the RAMdisk with the AppleWorks Desktop expansion, without the AppleWorks Desktop expansion, with other programs, with ProDOS, and with DOS 3.3. Each section attempts to anticipate problems that may occur and show you how to overcome them.

The Apple II Memory Expansion Card is a quick, easy RAM solution.

One significant hardware difference with the MultiRam Plus card is the availability of an external power-backup option. With this option plugged in, you can supply constant power to the QCard and MultiRam Plus card, with either AC power or batteries. Checkmate's idea is that you purchase a large RAM card, load all your programs onto the card once, and then execute them from the RAMdisk whenever you need them.

The MultiRam software even comes with a program selector called SQUIRT, which lets you choose the start-up file of any resident program from a menu to load it. For AppleWorks, for example, you use SQUIRT to choose APLWORKS.SYSTEM. When you quit a program, you end up back at the SQUIRT menu so you can choose another program to run.

Putting It into Perspective

The three cards I've described here represent three different philosophies about who is using RAM, what they're using it for, and how deeply involved in using it they want to be.

The Apple II Memory Expansion Card is a quick, easy RAM solution that gives you a bigger Desktop, transparent access to a RAMdisk, and the ability to run AppleWorks from RAM if you copy it there manually. If all you want is extra Desktop space and a RAMdisk, you don't even need to read the manual to use this card. As with other Apple Computer products, though, you do pay a little more for the Apple name, and you get only a 90-day warranty.

The RamWorks III card is oriented toward sophisticated AppleWorks users. It adds several valuable functions to AppleWorks, but installation is complex. Applied Engineering assumes that RamWorks users will trade ease of installation for a huge range of options or that those wishing to pursue other options have other sources of information for doing so.

The QCard/MultiRam combination tries to be everything for everybody. It offers most of the same AppleWorks enhancements as the RamWorks card and has a wide (and perhaps daunting) array of configuration and setup options to satisfy different tastes. Checkmate gives step-by-step procedures for a simple AppleWorks setup similar to that in RamWorks, but its RAMdisk options are more varied and complex. If you want access to a RAMdisk while using an expanded Desktop, this product is harder to configure. +

Small-business editor Charles Rubin's book AppleWorks *became available in an expanded second edition last fall. He writes about computing for various publications.*

VITAL STATISTICS

QCARD AND MULTIRAM PLUS

This RAM-expansion duo offers many AppleWorks enhancements, with a wide array of configuration and setup options that can be relatively complex.

CPU: *Apple IIe*
OPERATING SYSTEM: *ProDOS or DOS 3.3*
LIST PRICE (ESTIMATE): *Q-Card: $88 (0K), $149 (64K), $229 (256K); MultiRam Plus: $319 (256K); Power Module: $39*

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CIRCLE READER SERVICE NO. 360

QUESTIONS FROM OUR READERS

Claris, the publisher of AppleWorks, answers your AppleWorks questions.

BOOTING WITH WORKING COPIES

Q. *I have tried making several working copies of the new AppleWorks 2.0, but the program disk doesn't work. I have tried different disks. The Startup disk boots up fine, but the Program disk locks up the computer.*

A. This problem is common with new AppleWorks users. When making working copies of AppleWorks 2.0, you must accept the default volume name of /APPLEWORKS for *both* the Startup disk and the Program disk. If you change the volume name to other than /APPLEWORKS, the program will not boot properly. When the system utility formats the disk and asks for the volume name, just press the Return key to accept the default name. If your disks are named properly and you are still having problems, then reverse the location of your source and destination disks or try copying from the same disk drive. (Using only one drive for copying is a longer process, and you have to be patient and careful to insert the correct disk at each prompt.) If the two disk drives are not properly aligned, using one drive to make the copies can correct the problem. If you want to copy both the Startup side and the Program side of AppleWorks onto a two-sided diskette, like the original disk, we recommend using a certified double-sided disk.

MULTICOPY SPREADSHEET PRINTING

Q. *Printing a spreadsheet file on my Apple IIGS from AppleWorks 2.0, I get strange results. When I print only one copy of my spreadsheet file, everything prints fine on my ImageWriter II. When I try to print more than one copy of the same file, however, the additional copies seem to wrap around one on top of the previous one, halfway through the file. The last copy prints the entire file, but with the wrong page breaks. This problem occurs only when I try to print more than one copy.*

A. To solve the problem, check the following: Make sure you've selected AppleWorks' printer default settings and that the printer's DIP switches are set to their defaults (see your printer manual). Next, make sure you're not trying to print more characters per line than what your printer's platen width can accommodate. (For an eight-inch platen width, the typical character count is 80 characters without margin specifications.) Finally, check the Printer Port settings on the GS Control Panel and make sure the Buffering option is set to No. Setting the buffering to No prevents AppleWorks from sending too many characters too quickly to the printer.

ENTERING THE NLQ MODE

Q. *My new printer has a Near Letter Quality (NLQ) mode I would like to use from AppleWorks. How can I enter the NLQ mode when the word-processing module has no option for embedding the codes in a document?*

A. When you define a custom printer, AppleWorks expects you to enter printer codes that correspond to typical features such as boldface, underlining, and characters per inch. The program has no way of knowing if the codes you enter actually invoke these functions, however. Therefore, you can trick AppleWorks into allowing you to access almost all your printer's special features.

For example, when you're providing information on printer codes, enter the appropriate NLQ code as the code for 4 characters per inch. Then enter the code to turn off the NLQ mode as the 5-cpi code. Now, whenever you want to print something in NLQ, access the Options for Print Formatting menu, using open-apple/O, and set the characters per inch to 4. The text will print in NLQ until you change the cpi setting to 5 (your code for disabling NLQ). Using this method, you can easily fake out AppleWorks and utilize the special features of your printer, which the program otherwise wouldn't be able to recognize. An alternative way to force your printer into the NLQ mode automatically is to enter the code for NLQ along with the Printer Interface Control Code. Whenever the printer receives a Print command, your text will appear in the NLQ mode. Using a combination of these two techniques, you can make your printer default to a variety of settings.

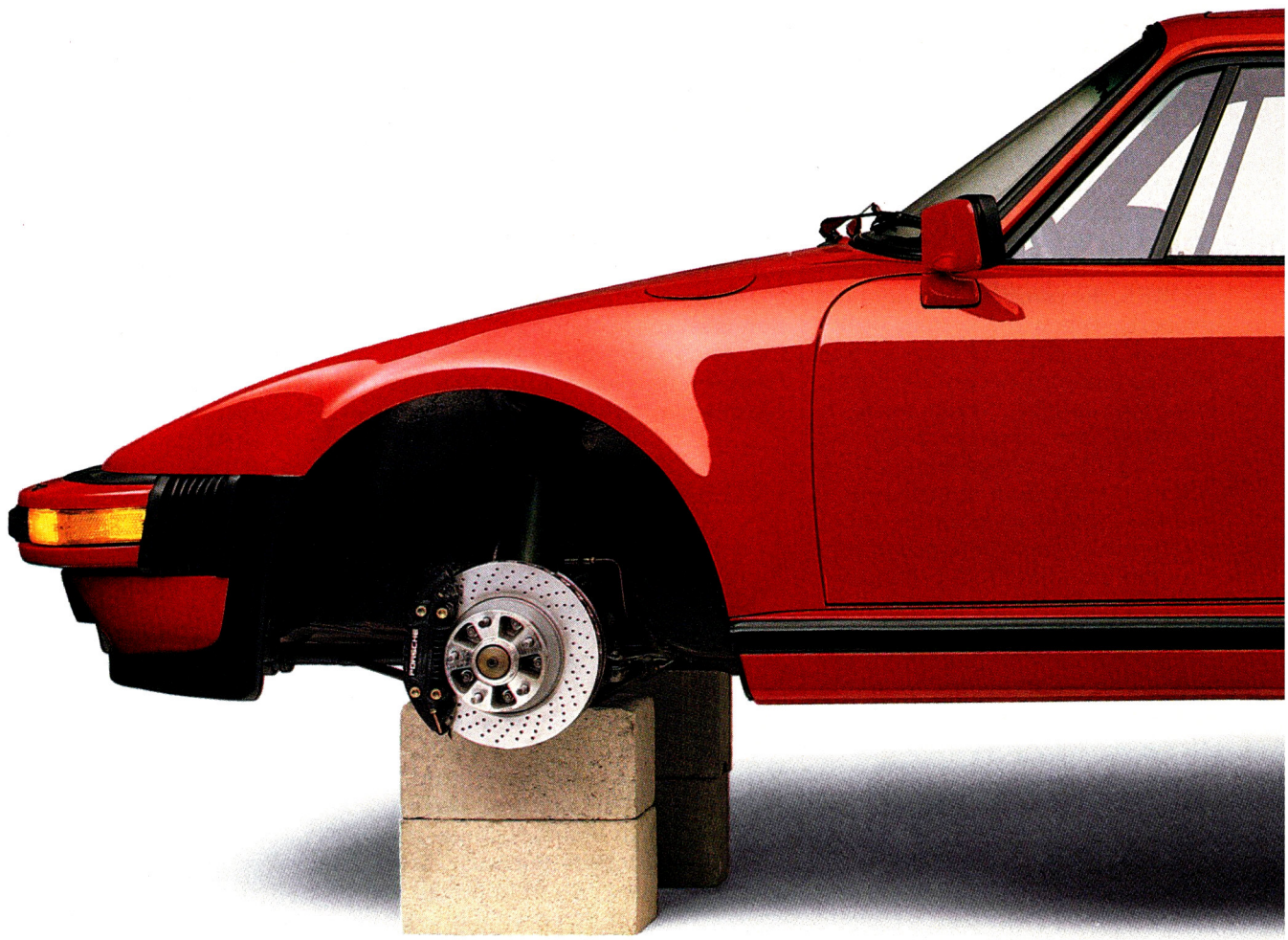
JOCKEYING FOR FILE SPACE

Q. *When I try to save a file I've edited, AppleWorks gives me a* `Not enough room on disk, OK to delete old file?` *message. The old copy of the file is 22K, the computer shows I have 18K available on the disk, and my file on the Desktop is 22K. Why am I getting that message?*

A. When AppleWorks saves to disk, it creates a second copy of the file on the disk and then deletes the old file. (This backup procedure enables you to abort the Save operation by pressing Esc.) It does not automatically start overwriting the existing file on the disk with the new edited file, so you need at least the same amount of space on the disk as the desktop file occupies. When you see the "not enough room" message, do not answer Yes to delete the old file. AppleWorks has a bug that may cause the saved file to be corrupted if you do this. Instead, delete the old file using the delete command from the Other Activities menu, and then save the new file again. ✚

The technical staff at Claris Corporation answers your AppleWorks questions. Write to Help File, A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Because of limited space, we aren't able to publish responses to all inquiries we receive.

Some Apple II owners still



It's like listening to Beethoven's 9th on a transistor radio. Or watching the Super Bowl on a five-inch screen.

Sure, your Apple II probably seems great just the way it is. But until you boot AppleWorks® 2.0, you won't really know what it's capable of doing.

AppleWorks combines three of the most popular applications in one powerful, easy-to-use package: a sophisticated word processor for swiftly creating dynamic marketing plans or compelling letters home to mom. A spreadsheet for compiling everything from next month's sales forecast to last month's household expenses—then changing the numbers in a flash as you ask questions like "what if I win the lottery tomorrow?" And finally, a database manager to store, sort and organize just about any kind of information you can think of.

Alone, each of these programs is a potent, practical tool.

But put them all together and your Apple II is suddenly traveling in a fast lane you didn't even know existed.

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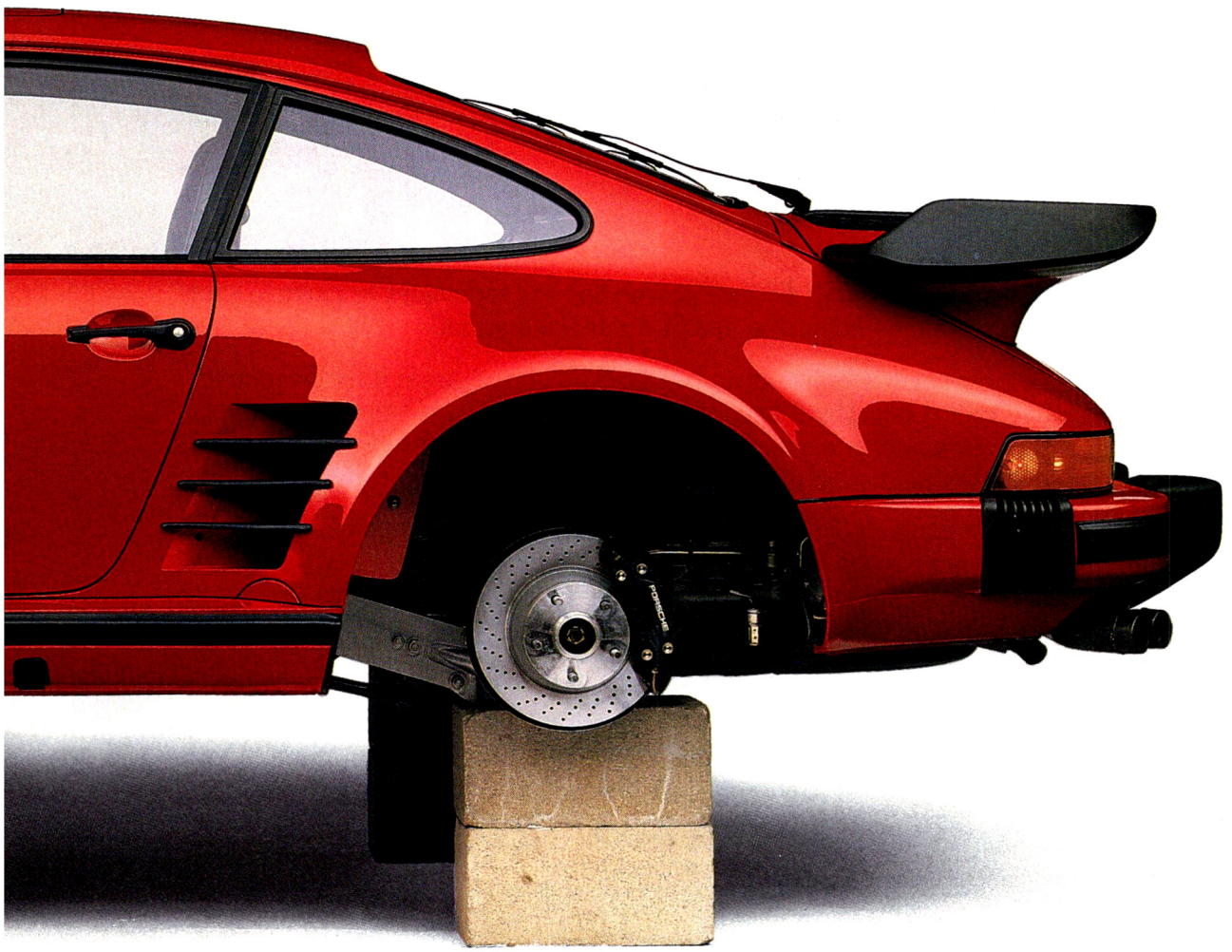
don't have AppleWorks.



You can zip from your stock portfolio to your monthly budget with a few deft keystrokes. Cut sales projections from a spreadsheet and paste them into a business plan in a matter of seconds. Or use the mail merge function to speed addresses from the data base to a form letter. All without swapping disks or rebooting. Even the learning process is accelerated, since you only have to learn one set of commands.

If all this isn't enough, you can choose from dozens of add-on programs to do things like draw graphs or check your spelling. Or use a RAM disk to take advantage of AppleWorks' extended memory support.

It's no wonder over 750,000 Apple II owners already work with AppleWorks (which is compatible with the entire Apple II family).

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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LEARNING CURVE

Computers help balance challenge and skill.

BY DAVID D. THORNBURG

LEARNING AND THE 'FLOW' EXPERIENCE

Have you ever had the experience of starting a good book and, after "a few minutes," glancing at your watch to see that many hours have passed? When we are so engrossed in something that we lose track of time, we are experiencing a state of "flow." We have become completely enmeshed with our task, whatever it is. Anything else we have been thinking about has been deferred, and the only thing that matters is our current activity.

This state of flow is not restricted to reading. The computer programs I remember the best are the ones that engaged me so completely that I worked with them for hours on end, forgetting about dinner and working well into the night.

Teachers and students occasionally experience flow in the classroom when they are lucky enough to have one of those days when everything goes right and the students and teacher are completely engrossed in their material. I've experienced flow in mathematics, in history, and in numerous other subjects many people think boring.

Of greater concern to many teachers are those times when some students are not experiencing this state. These students cause problems in class and complain of being bored. Their actions disturb everyone else and can frustrate the educational process.

Beyond Boredom

A few years ago, I had the pleasure of reading the book *Beyond Boredom and Anxiety*, a treatise on the flow experience by Mihalyi Csikszentmihalyi. He was interested in figuring out why people spent tremendous amounts of time playing games such as chess or undertaking dangerous activities such as mountain climbing. Activities of this sort aren't necessary for survival, and they're not money-making propositions. What he found in his numerous interviews was that such activities were undertaken because they provided people with the opportunity to experience flow.

See figure 1 for a graphic representation of his observations.

This graph shows challenge along one axis and skill along the other, with the interior divided into three regions. If a person's skill level exceeds the challenge of a task, the person becomes bored. If, on the other hand, the challenge exceeds the skill, anxiety sets in. When skill and challenge are in balance, you can experience a state of flow—a state conducive to enjoyable learning, in which you're completely engaged in the task.

Video-game designers may not have read the Csikszentmihalyi book, but the successful games all seem to have one thing in common: They keep players in flow, close to the border of anxiety. As a result, good video games always challenge their players and yet also provide enough intrinsic reward to sustain interest and to impart a feeling of accomplishment. This characteristic of video games can extend to other programs, including educational software. The key to capturing the attention and involvement of students may lie in the creation of rich multimedia activities. Even though research has confirmed again and again that most people are visual learners and that material presented with a visual, auditory, and kinesthetic component is almost three times more effective than material presented in a straightforward lecture, current teaching rarely moves beyond the awesome power of the slate sheet and piece of chalk.

ILLUSTRATION BY MOLLY WINDSOR-McLEOD

Contrast the normal classroom lecture with the rich multiple levels of communication used in a 30-second advertisement for a new soft drink. The simple fact is that we know a great deal about how to motivate and teach our youth, but this knowledge is applied more in advertising agencies than it is in our classrooms.

Getting the Message

Even though many pieces of educational software do an excellent job of integrating the senses in the learning process, most fall unnecessarily short of having the kind of impact you find, for instance, in an ad for McDonalds.

Because of the interactive nature of educational software, developers have the opportunity to create programs that can match skill and challenge to keep children in the band between boredom and anxiety. Although this balance is essential for maintaining the flow experience, it is not, in itself, sufficient.

In order to completely gain the attention and stimulate the learning ability of a student, a program (or lecture) must completely engage the learner. Anything not associated with the task at hand must drift from the mind. Some people call this state being in the present. One of the most frustrating experiences for most teachers is when they are completely engrossed in a lecture topic only to find that the students' minds are seemingly lost in space.

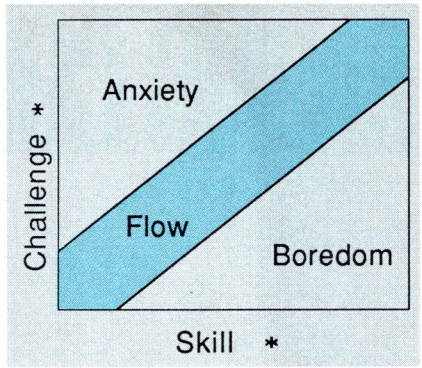

Figure 1: This graph shows the regions of boredom, flow, and anxiety in relationship to skill and challenge. Boredom occurs when skill exceeds challenge, and anxiety results when challenge greatly exceeds skill. Optimal learning takes place in the state of flow.

Computers and Isophors

Kathleen Forsythe, a creativity researcher in British Columbia, has defined a phenomenon called an isophor that can be used to achieve the kind of learner involvement that teachers would give their eyeteeth to achieve.

An isophor is an experiential metaphor. Whereas a metaphor is the description of one thing in terms of another, an isophor is the experience of one thing in terms of another. For example, many people who listen to Debussy's "Claire de Lune" experience a sense of calm flowing through their body as the music plays. This experience of calm that results from the experience of listening to music is an example of an isophor.

The isophoric process has the effect of complete engagement of learners, and it lends itself to use in computer programs.

I've recently been experimenting with isophors, using some simple programs I've written for the Apple II.

For instance, I've used one of my computational isophors as a prewriting tool. First I told my students to write a short poem without any preparation. Subsequently I dimmed the lights and ran the

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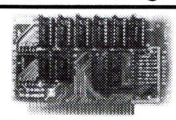

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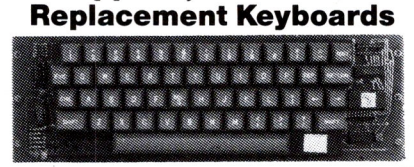

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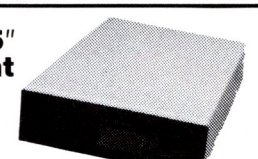

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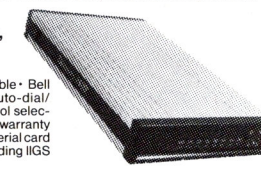

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CIRCLE 308 ON READER SERVICE CARD

The key to capturing the attention and involvement of students may lie in the creation of rich multimedia activities.

computer program from my June column with Satie's "Fifth Gnossienne" in the background. As soon as the program finished, I asked the students to write another poem.

The results were amazing. The first poems were mostly of the "Roses are red . . ." variety. The second ones were not. A typical second poem looked like this:

Quiet music
evolves
and the screen of patterns
emerges gently.
I also evolve
and my reptilian brain
relives a sun-drenched memory.
I change,
grow wings,
and fly away.

The computer portion of this activity took only five minutes, yet it facilitated the most wonderful transition in writing I've ever seen.

Look at some of the educational software you use every day. Examine it in terms of boredom, flow, and anxiety. Then work with the program to see what kind of experience it creates for you in your mind. Does it completely engage you, or does it seem to skim across the surface? Does the program "change gears" too abruptly, thus breaking the flow of your (or a student's) involvement with it?

The topics I've covered this month can be used to good advantage in designing and reviewing educational software. It's time we made history or poetry as engaging as a new price for hamburgers. I am convinced that we can achieve this goal with the aid of the computers we have in our classrooms today. +

Dr. Thornburg is well known for his work in the areas of educational technology and creativity. He welcomes letters from readers and can be reached in care of this magazine.

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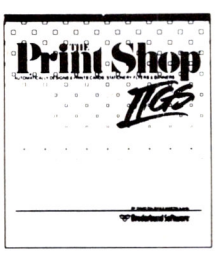

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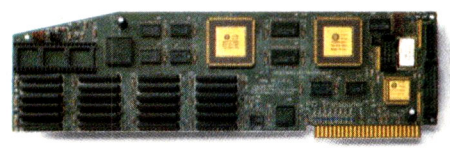

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PC Transporter memory choices.

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768K	**640K**	**759.00**

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BY JENNIFER BRAWER

The screens you'd love for your class are yours at the touch of a finger.

A+ TEACHERS' TOOLBOX

Many times I've looked at an educational-software program screen and wished it could be printed out and used as a worksheet, handout, or test item. Unfortunately, with the exception of print programs, most educational software traps graphic and text information on the disk, and the computer screen provides the only way to view it. If these programs have any print capabilities, they are reserved for teacher-utility options that track student performance or produce reward certificates.

Now it turns out that the screens you'd love for your class are available at the touch of a finger—literally. Sticking out the front of my IIGS is a little red fingerprint that helps me do screen dumps. Or, in laymen's terms, it stops programs and prepares the printer to print out screen images. This fingerprint is at the end of a cable attached to a graphic-utility card, especially designed for the IIGS, called FingerPrint GSi. The card lets you capture, print, and save any text or graphics screen; has desk accessories; and provides features for customizing your screen dumps and creating slide shows. In my opinion, no classroom IIGS should be without a FingerPrint GSi.

(Apple IIe users can avail themselves of FingerPrint+, the prototype for FingerPrint GSi. FingerPrint+ does screen dumps and also includes the basic features of its IIGS counterpart, such as handling any IIe graphic mode, text, rotation, limited enlargement, inversion, color, and cropping.)

Sticking out the front of my IIGS is a little red fingerprint that helps me do screen dumps.

FingerPrint GSi Basics

FingerPrint GSi does not interfere with the normal operation of the IIGS. It installs easily into any free slot; slot 3 is recommended, however, because it is not normally reserved for other cards. FingerPrint GSi is not picky about whether you're running DOS 3.3 or ProDOS software and is compatible with 18 different printers.

You activate FingerPrint GSi by touching the fingerprint switch that resides outside your computer. The card immediately interrupts the program and presents a main menu across the top of the screen. If you want to print the screen, you select Print Screen, and—presto!—a perfect black-and-white copy emerges from your printer. If you have a color printer and want color output, you need to select the Color option from a pull-down menu.

When you try your first screen dump with FingerPrint GSi, you may be baffled because some screen dumps print in 80 columns and are proportional to what you see on the screen, whereas others are about a quarter of their screen size. It so happens that this disparity is a programming issue. The size of the printout depends on the number of dots per inch—as you might expect, the lower the number of dots, the smaller the picture. The problem is easy to fix with some of FingerPrint GSi's more advanced features that change the size of the output.

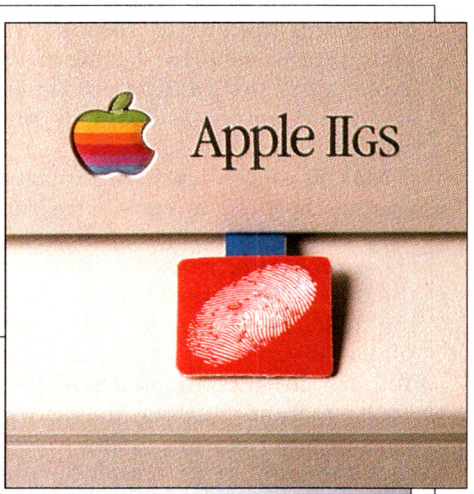
Customizing Screen Dumps

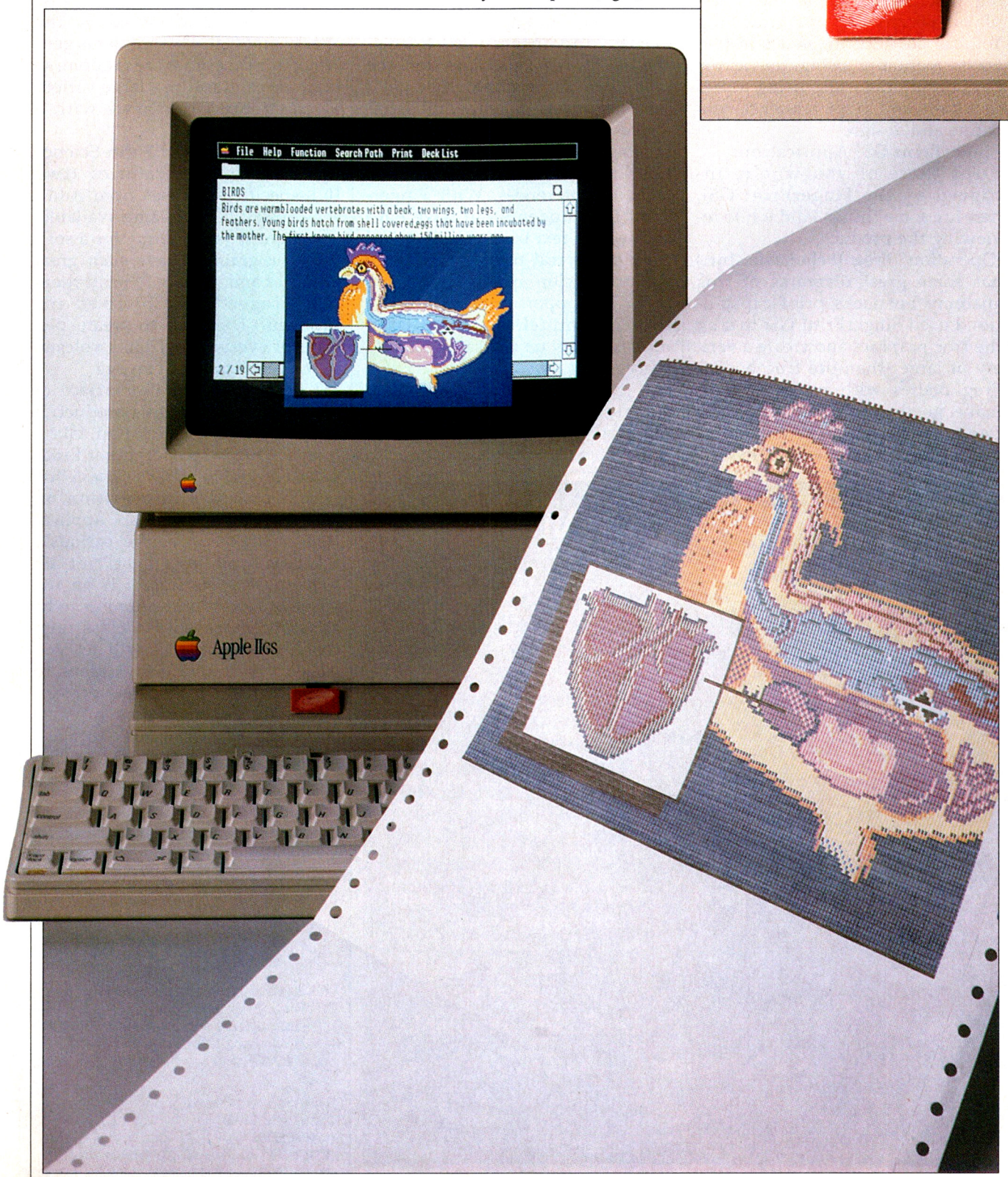
Capturing and printing a screen with FingerPrint GSi is so simple that you'll soon be off exploring its more sophisticated design options. To create custom printouts, you get numerous graphic tools, including a color option; an inverse option, which switches the foreground and background colors; a palette, which lets you change the printer's colors; a rotate-90-degrees option, which prints any image sideways; and vertical and horizontal image-flip options. The tool I use most frequently is the Zoom option, which lets you change the size of whole or partial screens and cures the problem of image-size differences.

Cropping is another vital feature for creating custom printouts. You can choose between using a flexible box to select whatever section of the screen you want to print and changing the actual screen-coordinate values. Once the section is cropped, you select the color, size, and printing position.

When you're ready to print out a screen, you use page-formatting options to position the images on paper and print multiple copies. You can also use the FingerPrint

With FingerPrint GSi you can capture and print an entire screen, or zoom in or crop to print only the desired portion (below). You activate FingerPrint GSi by touching a fingerprint switch that resides outside your computer (right).





PHOTOGRAPHY BY CARTER DOW

GSi menu options to reconfigure your printer to print headings or explanatory text in different fonts, sizes, and emphasis (bold or not bold).

Making slide shows with images you've captured is easy, with the help of the FingerPrint GSi slide-show program. This software turns the IIGS into a slide carousel, meaning that the GS sequentially displays screens of your choosing. You can advance the slides in two ways: manually using the arrow keys or automatically using a presentation and time sequence you define and design.

FingerPrint GSi Applications

For those of you who're intrigued by the FingerPrint GSi, here are some things I did while reviewing the product.

•Operation: Frog (Scholastic, Inc.) has some great diagrams of frog anatomy but lacks print capabilities. I used FingerPrint GSi to crop the frog graphics and create a variety of larger-than-life frog bodies. Frog bodies with organ systems make good study aids, and frog bodies without organ systems make great test items that require students to draw in the components of the organ systems.

No classroom IIGS should be without a FingerPrint GSi.

•In Read 'n Roll from Davidson & Associates, students select options that allow them to read paragraphs for the main idea, facts, sequence of events, and inferences. If they choose to read passages for the main idea, for example, they get a series of unrelated paragraphs, followed by a single question about the main idea. They don't get questions about sequence of events, facts, or inferences. With FingerPrint GSi, students can have hard copy of the text passages plus hard copy of several different types of comprehension questions, giving them the opportunity to practice several comprehension skills simultaneously on the same reading passage.

•At the end of a math-problem game sequence, Mindscape's Jumping Math Flash shows students all the problems they've encountered during the game. The problems they answered incorrectly are identified by a check mark. If you were accidentally eaten by a cursor-eating fish, a little fish identifies the problem you were supposed to have solved. Because the program doesn't display the answers, this screen makes a great math worksheet for entire classes or for individual students whose performance is identified by the checks and fish. The problems generated for the games are random, so teachers can capture a large variety of classroom worksheets with a FingerPrint GSi.

•When The Life and Earth Science Information Laboratories (two IIGS-specific databases from Addison-Wesley) first became available, I thought it was a crime for a software program to have such great graphics and no way to print them out. FingerPrint GSi fixed the problem—I used it to create pictures of everything from a volcano to the fertilization of an egg.

I only scratched the surface of the possibilities for this product. If you want more information, take a look at Thirdware Computer Products' *FingerPrint User's Newsletter*, which provides information on different FingerPrint GSi applications. Finally, if you're seriously thinking of adding FingerPrint GSi to your IIGS, Version II is on the verge of release and promises to be an even more useful classroom tool. For example, it will let you convert hi-res-graphics screens to super-hi-res, make large posters, and save screen dumps to MacPaint and MacDraw disk formats. Owners of the original IIGS can purchase the Version II ROMs for $35 to upgrade their cards. ✚

VITAL STATISTICS

FINGERPRINT GSi
A graphic-utility card that lets you capture screen graphics for printing

CPU: *Apple IIGS*
OTHER: *color printer recommended*
LIST PRICE: *$99; FingerPrint GSi Slide Show Progam, $15; Version II will retail for $129 and include the slide-show program and new utilities; upgrade for original GSi owners will be $35.*

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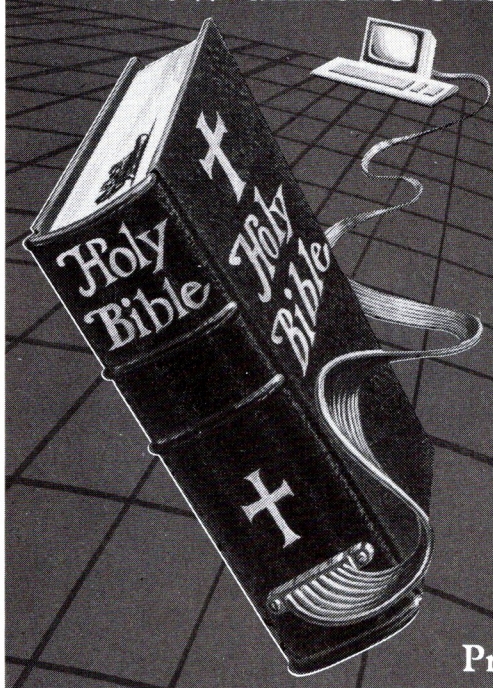

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TELECOMMUNICATIONS

Safe telecommunication may be your best protection against viruses.

BY MICHAEL FISCHER

WAYS TO BATTLE COMPUTER VIRUSES

We are all familiar with Apple II programs that have bugs, but—until recently—very few of us had heard about *viruses*, programs that *intentionally* cause your computer to malfunction.

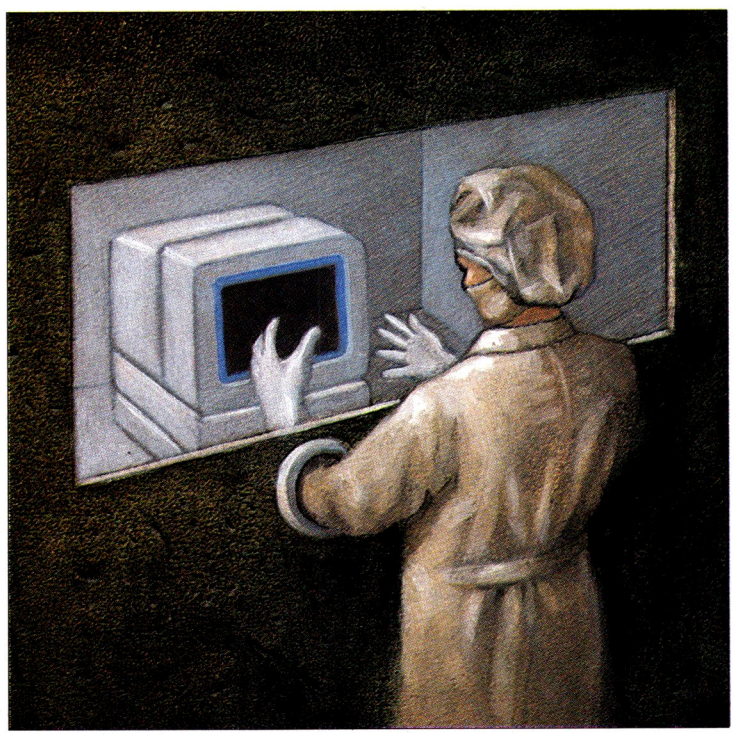
Viruses have recently been reported in Macintosh and MS-DOS systems. There has been a lot of talk about a ProDOS-based Apple II virus, although no one has yet confirmed its existence. Nevertheless, you should understand what a virus is so that you can better prepare yourself for the day one might infect your computer.

A computer virus is a program fragment that attaches itself to your operating system in some manner, normally staying hidden for a while. During that time it spreads itself to operating systems on other disks in your system and, if you trade programs with others, sometimes to their operating systems as well.

As with its counterpart in humans, the virus spreads in a largely undetected—and undetectable—manner until it is ready to do its damage. The most damaging viruses, when they do appear, destroy data, wiping out an entire hard disk. If you don't have a backup (preferably one from before the infection of your system), you stand to lose megabytes of data.

Unlike its human counterpart, a computer virus cannot be created without a malicious motive. The person who releases a computer virus obviously doesn't care about other computer users. This is not the stuff of which heroes are made.

Viruses often spread on telecommunications systems, when people trade programs. In the Macintosh world, a virus was spread on both GEnie and CompuServe and eventually found its way onto disks distributed by Aldus Corporation. That virus was originally contained in a public-domain HyperCard stack that purported to discuss products that Apple had not yet announced.



The virus flashed a screen message on a particular date and then deleted itself. Although it was not seriously harmful, the virus was an invasion and is reported to have caused problems with certain programs while it was present.

There are confirmed reports of destructive IBM viruses too. Some of these programs apparently destroy data files or the entire contents of a hard-disk drive.

To date, however, no case of a virus has cropped up on an Apple II program on any of the major national services such as GEnie, CompuServe, Delphi, BIX, or The Source. The leaders of the Apple groups on those services check programs very carefully. But many telecommunicators are speculating, primarily on GEnie and CompuServe, about the existence of a ProDOS-based virus originating from bulletin-board systems. Some people claim that they know people whose disks have been erased. People have mentioned that several programs may be infected, one of which is a bogus version of a prerelease commercial program.

The wisdom of public discussion of viruses is currently under debate, with some people maintaining that discussing them only encourages those who might write more. But, rightly or wrongly, the subject is now a common topic, having appeared in *Time* magazine and the general press. Therefore, *A+* readers should have an idea of how to deal with this potential problem.

What can we do to protect ourselves against viruses?

1. A system can't be infected with a file that is only a data file. A text

ILLUSTRATION BY TIM JONKE

file or a picture file that requires use of another program cannot contain a virus either. Therefore, be cautious about program files, but don't worry about data files.

2. Know the places from which you download files. The national information services carefully screen their files—no guarantee that the files are virus-free, but a safer bet.

3. Check around within any bulletin-board systems new to you. Ask the sysops what they do to check files. Talk to other users of the board. If the board appears to be interested in its users, it is more likely to have well-checked files. A pirate bulletin board is much more likely to contain infected files.

4. Keep in mind the old saying: "When something is too good to be true, it usually is." The Mac virus came from a file that purported to list confidential information.

5. The Apple IIGS is more susceptible to viruses than is an Apple II Plus or IIe, because of the greater complexity of the system. Since many Apple IIGS systems have hard-disk drives, the damage potential of a virus is greater.

6. If you have a hard-disk drive, back it up regularly; keep several generations of backups; and, if you think you have an infected disk, be sure to restore your hard disk's programs and system from the original disks—not from a backup you've made from the hard disk.

7. If you are the sysop of a bulletin-board system, make sure you know the people who upload files to your board. It's a good idea to require new callers to give you their full name, address, and telephone number. Only after you've confirmed the accuracy of this information should you grant that person access to your system. Letting any caller post a program anonymously is an invitation to disaster.

8. As a sysop, you should have files uploaded into a private holding area to which your other callers do not have download access. Allow the public to download files only after you have taken the time to screen new uploads to make sure they function properly, are what they purport themselves to be, are not copyrighted, and pose no danger to users' systems.

Most of these rules are not difficult to follow. In fact, they make general good sense. You should also know that some people are taking other steps to protect your computer from viruses. Guy T. Rice, cosysop of the Apple II Programmer's and Developer's Forum on GEnie (A2Pro), has written a program for the IIGS that checks part of your disks on bootup to see if they have been modified by a virus. Although it might not work in every case, it does provide a measure of protection. The program is available on GEnie.

Glen Bredon, author of ProSel, Merlin 8/16, and numerous other utilities, has written a shareware program that checks various files on your system to see if they have been modified by a virus. The program contains data encryption and password protection so that a virus can't find this program and its data and modify it. It is available on both GEnie and CompuServe.

Luckily, we can take steps to protect our data without losing the advantages of personal computers and the free exchange of information. ✚

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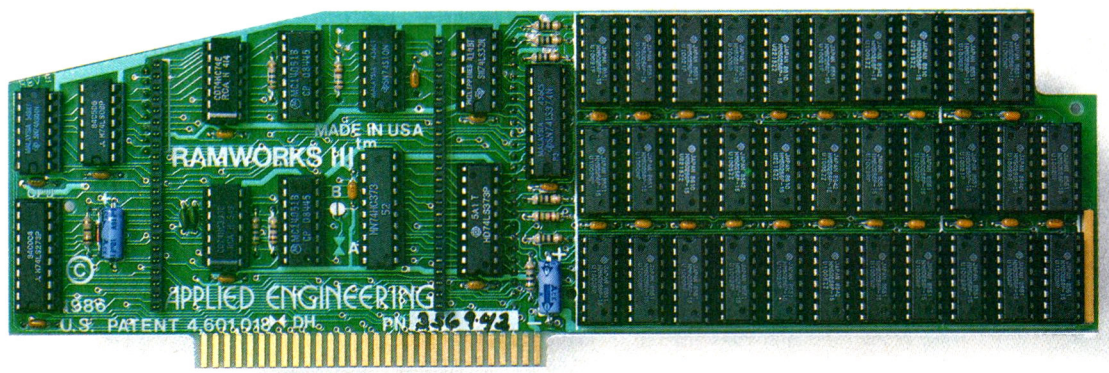

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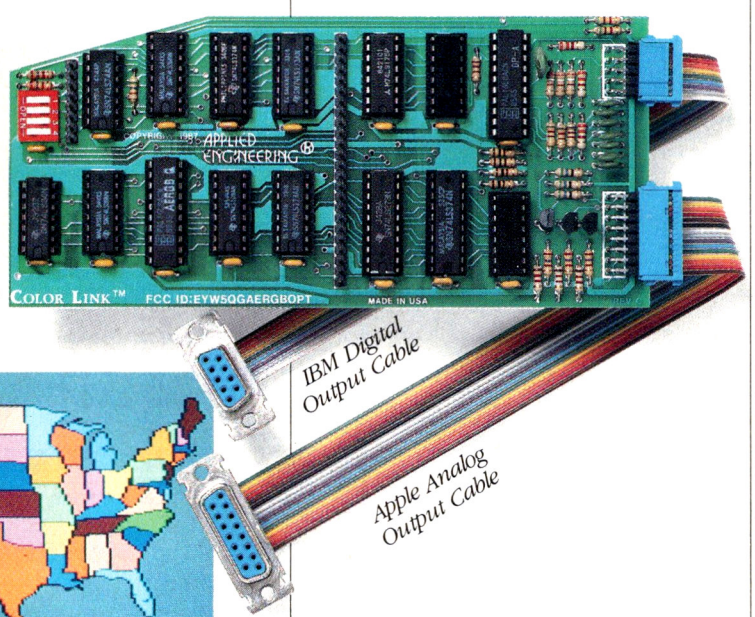

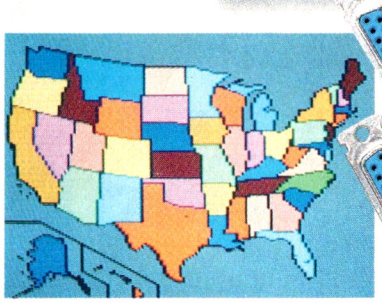

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SPEAKING OF GRAPHICS

The Kurta graphics tablet and precocious Gallery contributors

BY ROBERTA SCHWARTZ AND MICHAEL CALLERY

OF TABLETS AND YOUNG ARTISTS

As many of you know, we teach computer graphics and desktop publishing at the New School in New York City. We've taught hundreds of aspiring computer-graphics artists, and nearly all our students have problems drawing and painting with the mouse. The mouse is a superb pointing device for choosing menu items, selecting text and objects, and so on. For freehand drawing, however, it leaves a great deal to be desired—it just doesn't feel right. Artists are used to drawing with tools between their fingers, not with corded boxes propped under their hands.

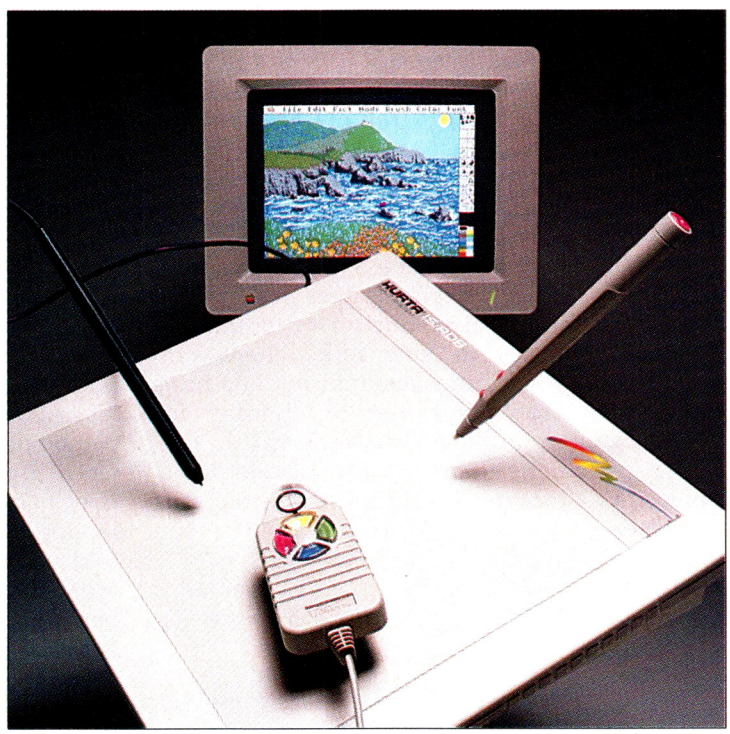
The ideal computer drawing tool is the graphics tablet. A tablet has a penlike stylus attached to it, and you draw with it just as you would with a pencil and sketch pad.

Apple recognized the importance of graphics a long time ago and made a graphics tablet one of the first peripherals for the Apple II. The Apple Graphics Tablet, with its large drawing surface (more than 12 inches square) plugged into an interface card that fit into a slot on the Apple II, II Plus, or IIe. When you used compatible software, moving the stylus over the surface of the tablet caused a tracking cursor to move, much as the pointer follows the mouse on more recent Apple computers. The point of the stylus was retractable. When you pressed down on it, the software reacted in the same way that current software reacts to a click of the mouse button. Not only were you drawing naturally, but you also had the added benefit of being able to trace pictures. All you had to do was place the picture on the surface of the tablet and follow its lines with the stylus. (Have you ever tried to trace a picture with your mouse?)

Most Apple II graphics software of the early 80s, including Blazing Paddles and Dazzle Draw, worked with the Apple Graphics Tablet. In fact, even now you can plug The Apple Graphics Tablet into an Apple IIGS, and it will work fine with those programs.

Why, then, are we writing about the tablet in the past tense? Because Apple no longer makes it. The tablets were quirky: sensitive to all sorts of magnetic interference and difficult to repair. Since Apple no longer manufactures its tablet and because so few of them sold (in relation to the number of Apple II computers), no Apple IIGS software that we know of works with the Apple Graphics Tablet.

Although Apple no longer makes a graphics tablet, the company is aware that drawing tablets (and other custom input devices) are necessary. With the IIGS (and the most recent Macintosh computers), Apple engineered a standard interface for input devices, the Apple Desktop Bus (ADB). The ADB is "intelligent"; that is, if you plug in multiple devices, the system software recognizes them. If you have an Apple IIGS, you don't have to worry about doing lots of custom programming to get your different peripherals to work with it, and, even better, the same device can work on any Apple computer with an ADB interface.



Enter Kurta

Kurta Corporation jumped into the ADB market early on; it demonstrated a working ADB tablet at the Apple IIGS rollout in September 1986. Getting one of its tablets to review, however, has proven a bit elusive. We finally made the right connection (thanks, Linda!) and have been working with a Kurta IS/ONE ADB tablet for the past month or so. It's terrific. The tablet comes in several sizes; we

have the 8½ × 11-inch version. The tablet does not require an external power source, so its only wires connect it into the ADB.

Chances are, even with a tablet, you'll want to use your mouse too (for word processing and other applications). No problem. On the back of the tablet is an ADB connector for daisy-chaining additional devices. Plug the tablet into the GS ADB connector and plug the mouse into the tablet. You have the best of two worlds.

One Tablet, Many Options

Kurta offers several drawing tools that work with the tablet. We tried a wireless "Pen Mouse" as well as the standard pencil-like stylus (called a corded stylus) that plugs into the tablet. The Pen Mouse is the most comfortable tool for drawing and painting, since it has no connecting wires to get in your way. Kurta also offers a puck, which resembles a mouse but has cross hairs and multiple buttons and is particularly useful for mechanical drawing.

After you've plugged the tablet in and booted the system, the desktop pointer that appears on the screen responds to the stylus just as it responds to the mouse. In fact, you can alternate between the mouse and the stylus, and the pointer will dutifully follow. Because ADB is intelligent, it checks to see what you have connected when you turn the system on. (Do not plug in or unplug an ADB device while the system is on, or you'll confuse the ADB and probably crash the system. You might also damage the ADB circuitry inside the computer.)

The system perceives the stylus, Pen Mouse, or puck as a mouse: As you move the pointer-control device across the surface of the tablet, the pointer follows, but if you lift it off the tablet and bring it down on another area of the tablet, the pointer does not jump to a corresponding area on the screen. It responds only to uninterrupted contact on the tablet surface. This "mouse action" is fine for pointing, selecting, and dragging—but for freehand drawing, you want your drawing device to respond more like a pencil or paintbrush. When you lift a pencil from the paper and put it down on another part of the paper, you start drawing from

If you enjoy drawing and painting on your IIGS, place the Kurta tablet on your "must have" list.

there. To provide this more natural response to your moves, Kurta provides software, in the form of a desk accessory, that transforms the tablet into an absolute device. This option maps the pad to pixel coordinates on the screen—lifting the stylus and moving it to another part of the tablet causes the pointer to move to the corresponding part of the screen.

Try It

There's not a lot to say when you are reviewing a device like this one. Does it work with GS software? Yes—thanks to ADB. We used the tablet with DeluxePaint II, 816/Paint, and Paintworks Gold. Super! Is the tracking smooth and responsive? Yes—although the cordless stylus lags a bit behind your hand movements (the corded stylus does not). Is it reliable? Yes—we have more than a dozen older Kurta tablets at the New School that are subject to rigorous handling by beginning students, and not one has broken down.

We'd urge you to rush out and give the tablet a try; unfortunately, however, Kurta does not have a wide distribution to computer stores. In New York, where computer stores abound, not one has a graphics tablet on display for would-be purchasers to try. In fact, none that we know of sells Kurta tablets. You should contact the company to find out how to get one in your neck of the woods.

If you enjoy drawing and painting on your GS, do place the tablet on your "must have" list. Even if you've mastered painting with the mouse, you'll find that painting with a stylus instead is a joy. How much do we like the Kurta IS/ONE ADB tablet? We purchased our review unit.

VITAL STATISTICS

KURTA IS/ONE ADB

This graphics tablet for the Apple IIgs and Macintosh offers superb control for freehand drawing.

CPU: *Apple IIgs and Macintosh*
DISK DRIVES: *one 3.5-inch for PenWorks software*
OPERATING SYSTEM: *ProDOS 16*
COPY PROTECTION: *no*
LIST PRICE: *$395 (includes corded stylus); cordless stylus, $150; puck (corded), $100; puck (cordless), $150*

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YOUNG ARTISTS

In the last few months, we've received the usual number of entries for "Graphics Gallery." What is unusual is that more than half of these entries are from artists under the age of 18. We're so impressed with the work of these young people that we decided to dedicate this month's "Graphics Gallery" to them.

Jason Roth

The youngest contributor, Jason created his "Gallery" submissions when he was 10 years old (he recently celebrated his 11th birthday). We were intrigued by the stylized detail and use of line in these graphics; each one is a fine miniature. According to his mother, Jason was never interested in art until a year ago, when he received an Apple IIGS and Paintworks Plus for his birthday. Since then, Jason has been dwelling in the world of FatBits, where he painstakingly ekes out his images. Jason's school has GS computers, and he enjoys showing his classmates how he does his graphics.

Greg Ely

Greg is 13 years old. His dad, a microbiologist, uses a IIGS in his lab. About six months ago, Greg's dad bought a GS for the family, and Greg began to draw. Like Jason, Greg had little interest in art before he got his computer. In fact, Greg told us that he's not a very good artist and that he can't draw on paper. The IIGS is another story. He finds that drawing with DeluxePaint II on the computer is fun.

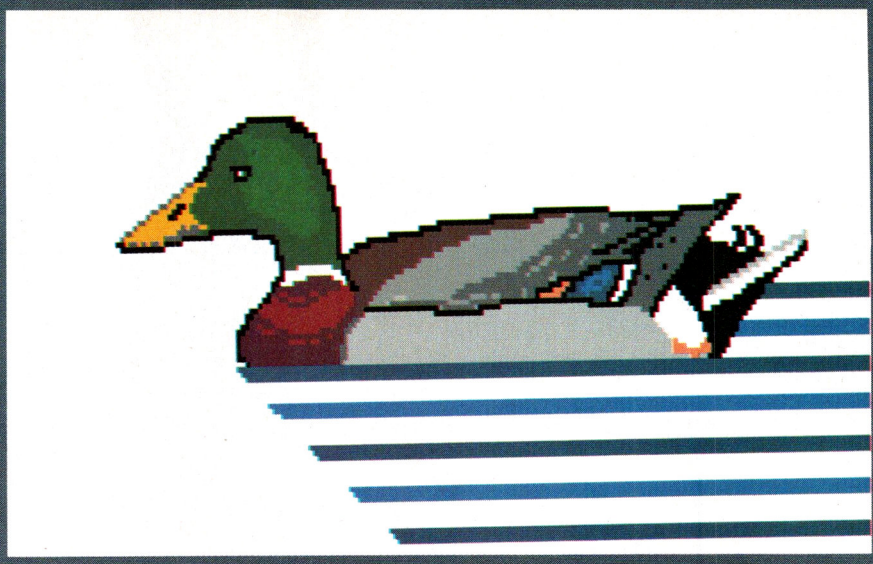
Greg describes himself as an avid bird-watcher. His drawings are of birds that he's seen in his backyard. He draws them from memory, and each one takes him two to three hours to complete.

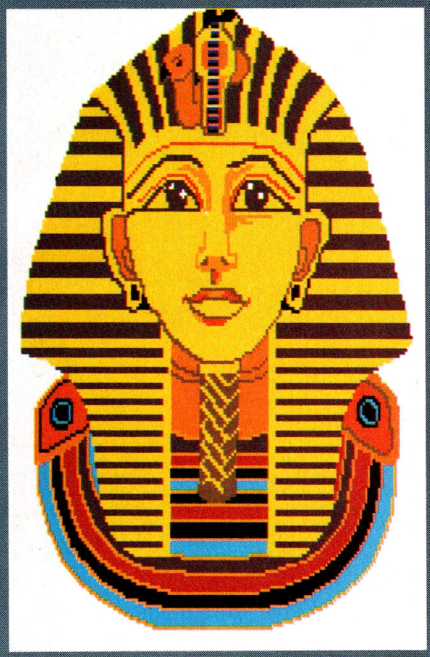
Look again, Greg. You're a very good artist.

Mike Parker

Mike is 15 years old. We were unable to reach him on the tele-

SPEAKING OF GRAPHICS GALLERY





MALLARD DUCK (above) and SPARROWHAWK (right), **GREG ELY,** *COLA, SC*

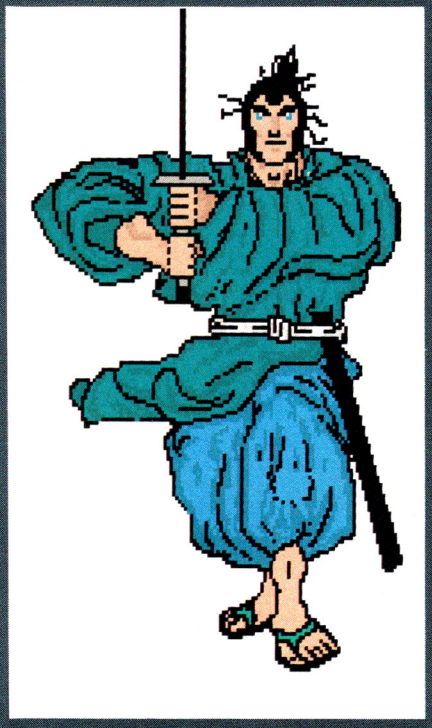
TUT (left) and SHELLS (below), **JASON ROTH,** *Cedarhurst, NY*

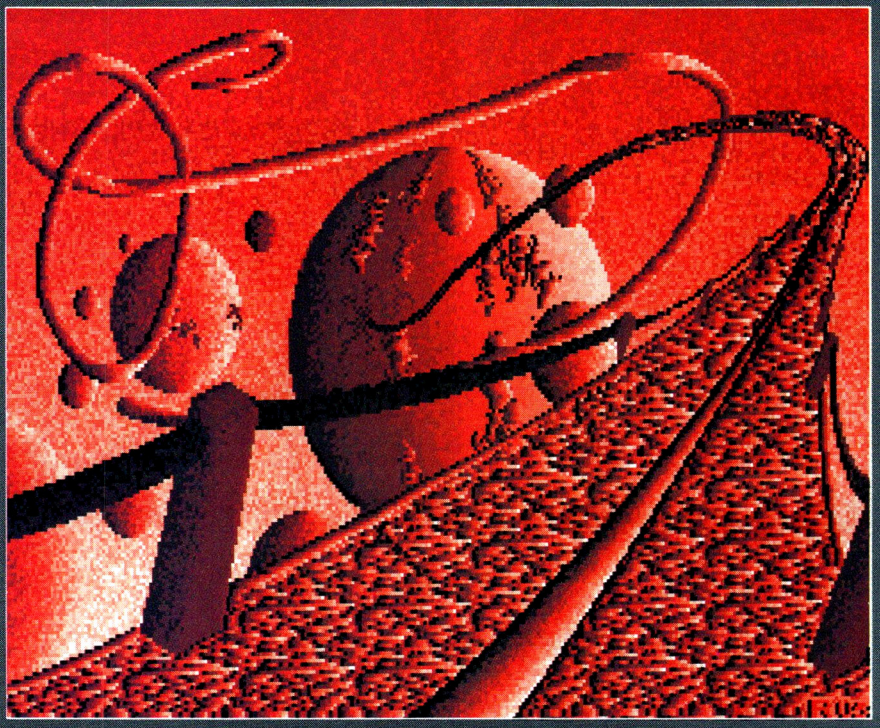
LIBERTY, **JASON ROTH,** *Cedarhurst, NY*

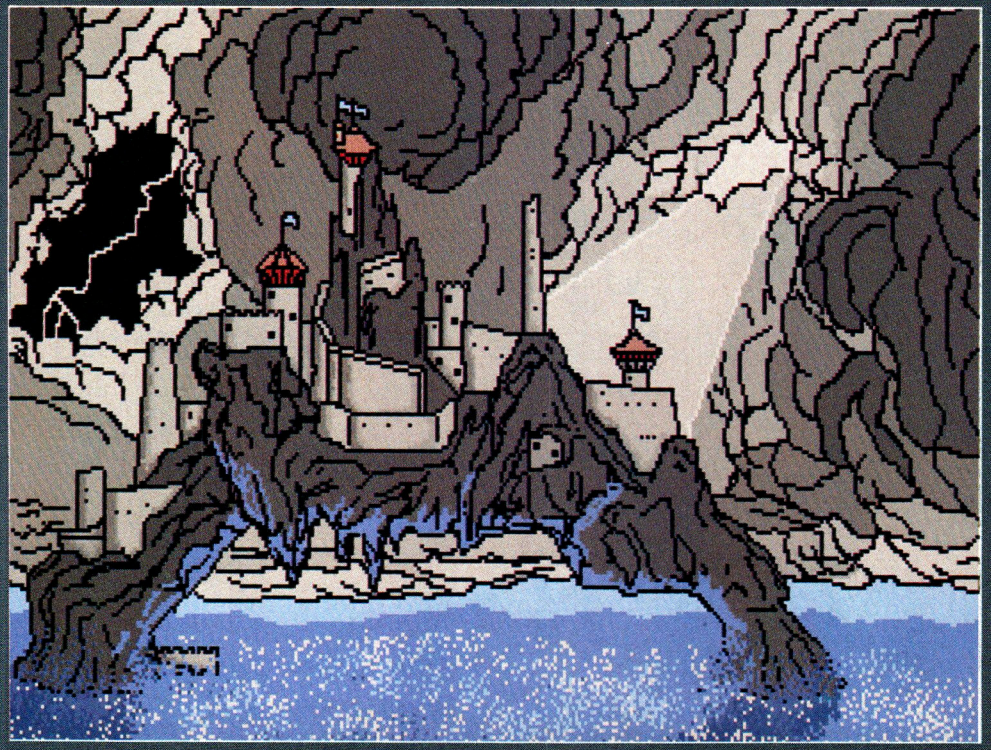
SPEAKING OF GRAPHICS GALLERY

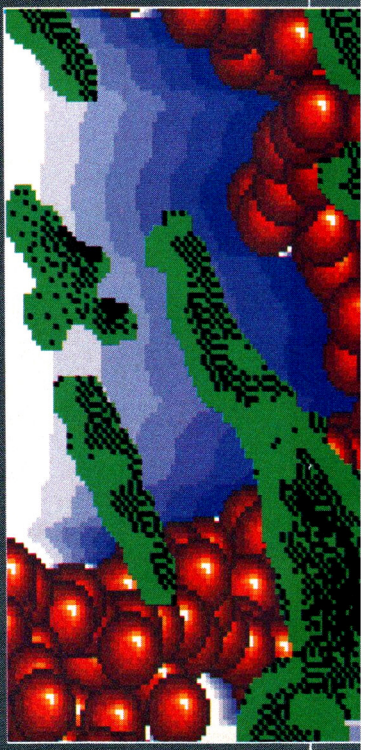
SAMURAI WARRIOR (below) and CASTLE OF THE SEA (bottom left), **MIKE PARKER,** *Naperville, IL*

FLOWER (right) and GATE 23 (below), **RUSSEL HOLT,** *Dublin, OH*

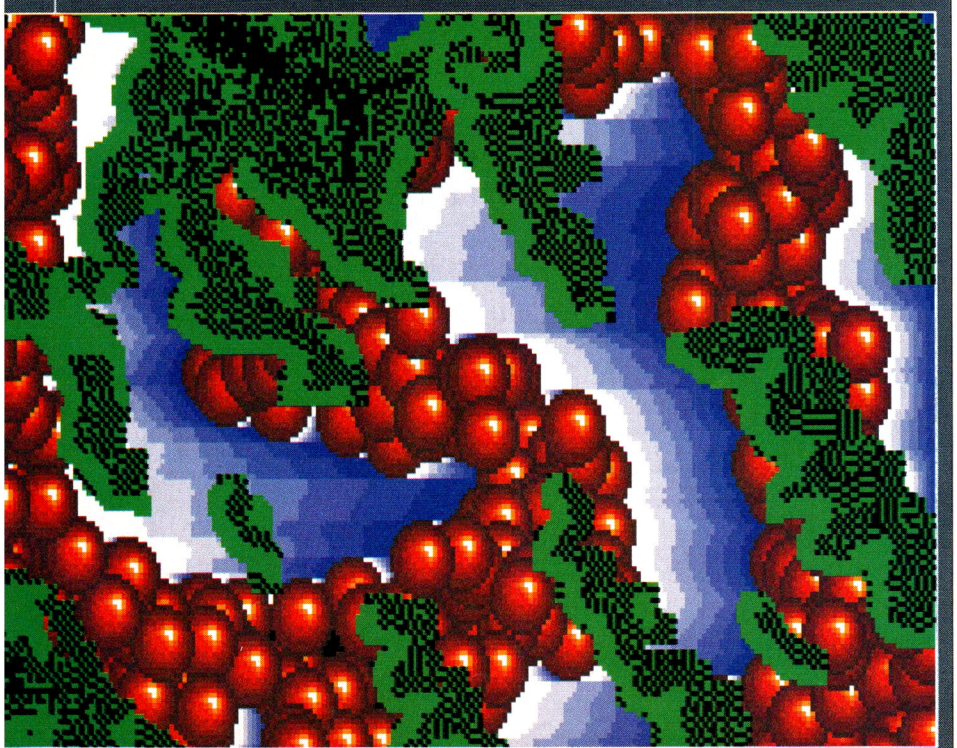








SELF-PORTRAITS (left), FLARE-UP (below), and MY REALM (bottom), **RUSSELL HOLT,** *Dublin, OH*



It's exciting to know that the IIGS is inspiring so many young people to express themselves through art.

phone, but we know, from the letter that he sent along with his entries, that he's a tenth-grade high-school student who hopes to be a commercial artist. Mike used Paintworks Plus to create his images. We think he's well on his way toward achieving his goal.

Russell Holt

At age 16, Russell is the oldest artist whose work appears in this month's "Gallery." A high-school sophomore, aspiring to be a computer scientist, Russell explains that his schoolwork prevents him from spending as much time as he'd like on the computer. He does a lot of programming and says he loves the GS, but he wishes it had more speed (we'll second that!) and a built-in BASIC with direct access to the computer's sophisticated sound and graphics routines.

Russell has always been interested in art. He explains that he finds the GS more gratifying than conventional artists' tools because he has more control over the details of his work. His images, created with DeluxePaint II, come spontaneously from his imagination.

By the way, Russell's school has one room full of Apple IIGS's and another full of Macintosh Pluses. Russell prefers the IIGS.

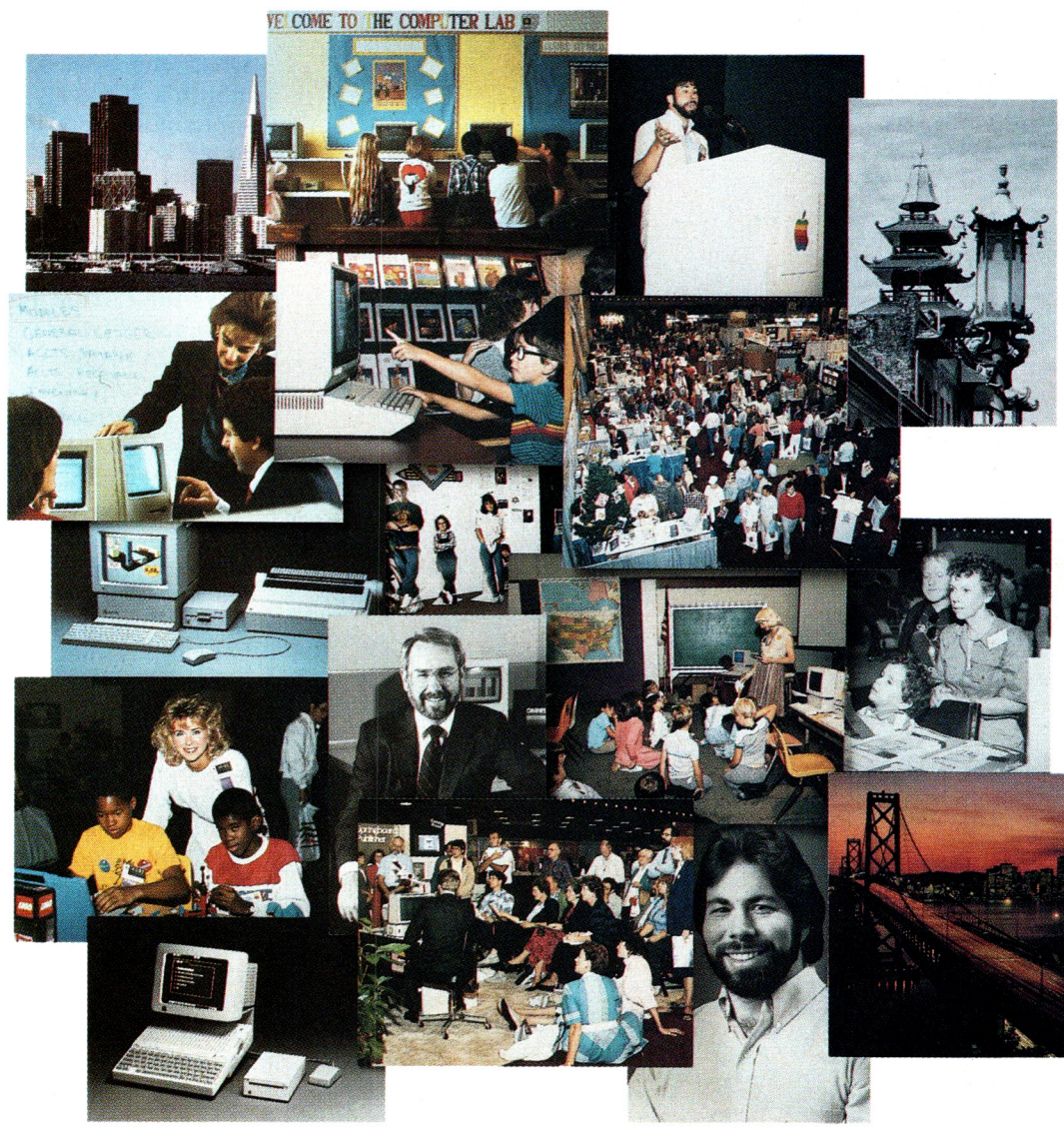
Artistic Inspiration

We find it exciting to know that the Apple IIGS is inspiring so many young people to express themselves through art. If they hadn't gotten their computers, would Jason and Greg eventually have picked up pencils or paint and started to draw or paint? We'll never know for sure. What we do know is that, thanks to the Apple IIGS and the excellent paint software it has spawned, more people than ever are experiencing the joy of painting.

Look for the annual *A+* education issue later this year, in which we'll once again showcase the work of young artists. ✚

APPLEFEST

Now, picture yourself at AppleFest/San Francisco.



Last spring, we asked you to imagine yourself in Boston for AppleFest® – the biggest, most exciting Apple® gathering ever.

By the tens of thousands, you came and you made it just that. In fact, AppleFest/Boston was so big, and so exciting, that we couldn't just stop there. So we're doing it again.

September 16-18, 1988. Brooks Hall and the Civic Auditorium, San Francisco, CA. Picture an even bigger AppleFest – more than twice as big as last year's San Francisco show.

Twice as many exhibits, including virtually every company with a product in the Apple II® marketplace. Twice as many learning opportunities, including nearly 100 hour-long sessions, free presentations and intensive, day-long workshops. Twice as many celebrity keynote speakers.

AppleFest/San Francisco will take over Brooks Hall and the Civic Auditorium on September 16-18. For more information, fill out the coupon or call 1-800-262-FEST (617-860-7100 in MA).

The biggest, most colorful, most exciting AppleFest yet. Nice picture.

Roy Einreinhofer

President

YES! I can picture myself at AppleFest.
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☐ Exhibiting at AppleFest
☐ Attending special AppleWorks® workshops during the show.

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One Forbes Road, Lexington, MA 02173

APPLEFEST '88 SAN FRANCISCO

CIRCLE 212 ON READER SERVICE CARD

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BY SHANON CULLEN AND MARY BOHANNON

A collection of interesting products for you and your Apple II-series computer

PRODUCT ROUNDUP

Four new computer-care products from Perfect Data

SPORTS SCHEDULER

Sports Scheduler lets you schedule teams and facilities for any league with 4–22 teams. You can arrange up to 231 games in sets and round-robins. The program works in conjunction with many word-processing and spreadsheet programs, including AppleWorks.

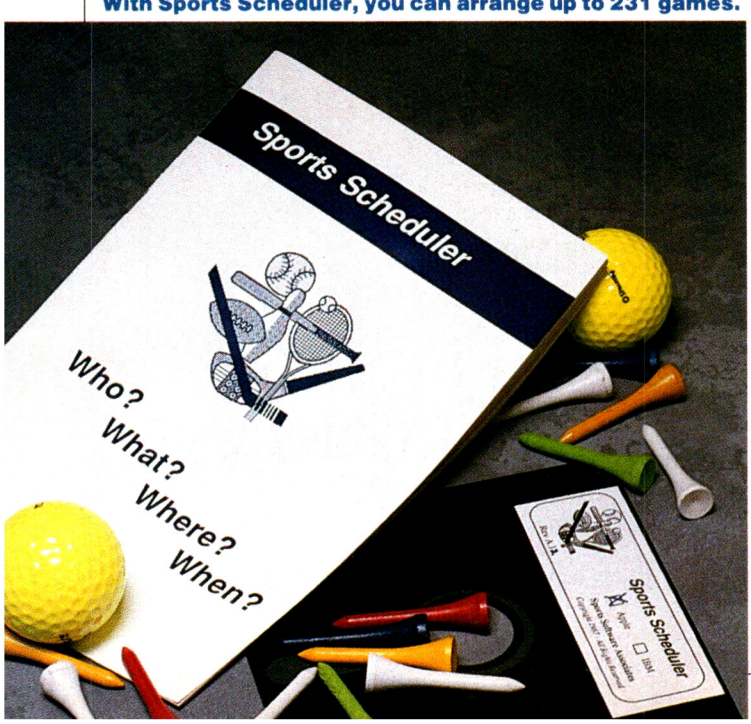
List Price: $119.99 (introductory price: $89.99)

Requires: Apple IIe, IIc (with 80-column card), or IIGS; 128K RAM; one 5¼-inch disk drive; printer recommended. ProDOS; copy-protected.

Sports Software Associates
75 Recreation Park Drive
Hingham, MA 02043
(617) 749-7880

CIRCLE READER SERVICE NO. **501**

With Sports Scheduler, you can arrange up to 231 games.



PERFECT DATA PRODUCTS

Perfect Data has introduced four new computer-care products: PerfectDuster, Master Platen Cleaning Kit, Keyboard Cleaning Kit, and Dot Matrix Printer Cleaning Kit.

The Perfect Duster is canned air, which you can use for cleaning computer components that are difficult to reach or should not be cleaned with liquid solvents. The product is nontoxic, dries quickly, and does not leave a residue. The 12-ounce can has a variable trigger that lets you control dispensing.

The Master Platen Cleaning Kit is designed to clean accumulated ink off platens. The cleaning solution rejuvenates the platen as it cleans and does not cause platens to dry and crack. The kit includes 8 reusable platen-cleaning brushes and 2 4-ounce bottles of platen-cleaning solution.

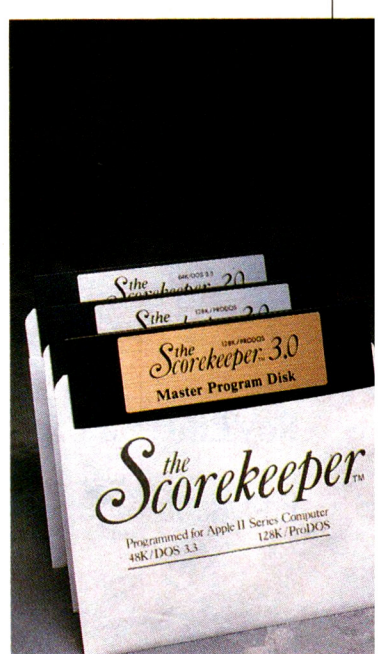
The Keyboard Cleaning Kit contains a Perfect Duster, 10 double-ended foam-tip swabs, 1 ounce of CS85 Cleaning Solution, 4 ounces of Case & Cabinet Cleaner, and 25 nonresidual wipes. You don't need any special tools.

The Dot Matrix Printer Cleaning Kit contains a Perfect Duster, print-head cleaning sheets for both 80-column and 132-column printers, CS-85 cleaning solution, 6 reusable platen-cleaning brushes, a 4-ounce bottle of platen-cleaning solution, and an instruction manual.

List Price: Perfect Duster, $5.95; Master Platen Cleaning Kit, $19.95; Keyboard Cleaning Kit, $23.95; Dot Matrix Cleaning Kit, $34.95

Perfect Data Corporation
1825 Surveyor Avenue
Simi Valley, CA 93063
(805) 581-4000

CIRCLE READER SERVICE NO. **502**

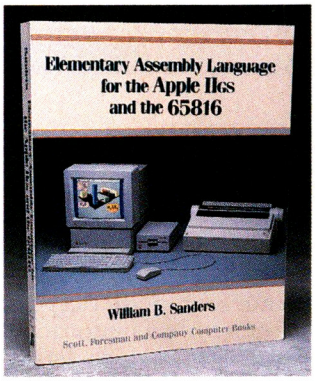


SCOREKEEPER

ScoreKeeper, Version 3.0, is a record-management system that allows you to create and alphabetize class lists for up to 500 students in an unlimited number of classes; record scores in four categories; and determine quarter, semester, and trimester grades. You can make corrections to scores, quarter grades, points possible, low scores, student numbers, and spelling of students' names and print out several lists and reports.
List Price: $79.95
Requires: Apple II Plus (48K version of program); IIe, IIc, or IIGS; 128K RAM; one 3.5- or 5¼-inch disk drive; printer recommended. DOS 3.3 (II Plus) or ProDOS; copy-protected (master disk copies as demo); site licensing available.
Stokes Publishing Company
1125 Robin Way
Sunnyvale, CA 94087
(408) 736-4637
CIRCLE READER SERVICE NO. **503**

ELEMENTARY ASSEMBLY LANGUAGE FOR THE APPLE IIGS AND THE 65816

This book, by William B. Sanders, introduces readers to assembly-language programming on the Apple IIGS and the 65816 microprocessor. The book includes a thorough discussion of assemblers, contains tips on organizing machine/assembly-language programs, and demonstrates how to create and animate graphics, generate sounds and combine them with graphics, and build a subroutine library and merge routines.



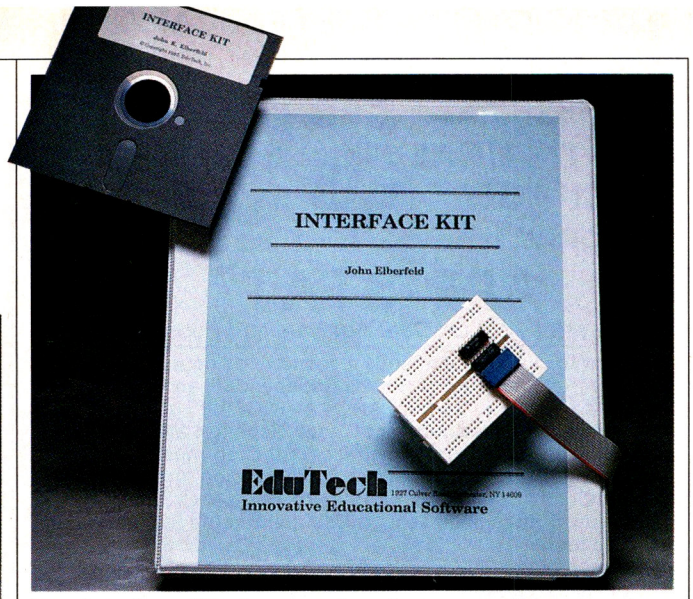
An introductory book on assembly-language programming

List Price: $19.95
Scott, Foresman and Company
1900 East Lake Avenue
Glenview, IL 60025
CIRCLE READER SERVICE NO. **504**

INTERFACE KIT

EduTech's Interface Kit is designed to help teachers and students gain hands-on experience designing and constructing interfacing circuits. The kit provides practical programs and interfacing circuits to measure temperature, relative light intensity, and extremely small and precise time intervals. It explains each circuit in detail and each program listing line by line.

The kit also introduces digital electronics by allowing students to wire and test integrated circuits and connect these circuits to Apple II computers through the game-paddle port.
List Price: $69.95 (includes software, electrical components, and instructions)
Requires: Apple II Plus, IIe, IIc (with 9-to-16-pin adapter—some experiments do not work with the IIc), or IIGS; 48K RAM; one 5¼-inch disk drive. DOS 3.3; not copy-protected.



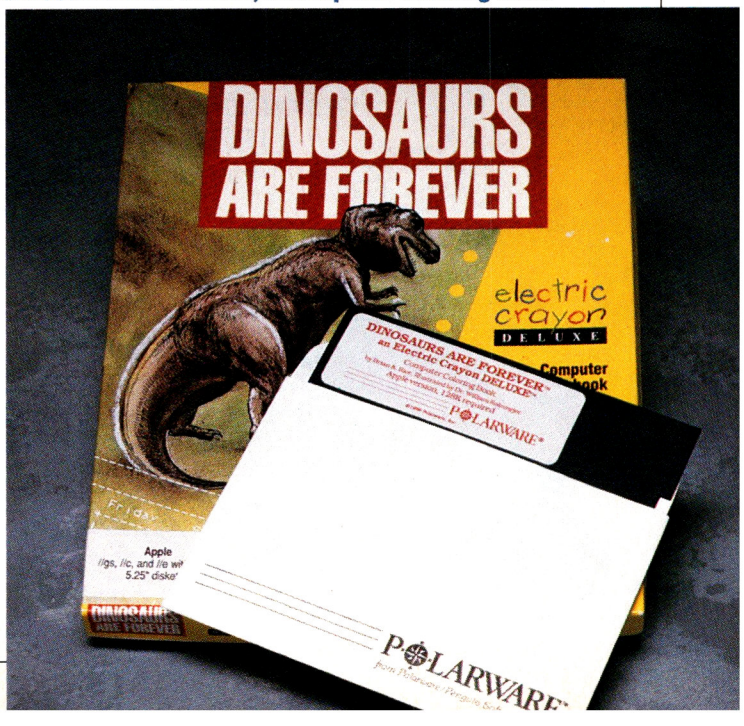
The Interface Kit gives you hands-on experience designing and constructing interfacing circuits.

EduTech
1927 Culver Road
Rochester, NY 14609
(716) 482-3151
CIRCLE READER SERVICE NO. **505**

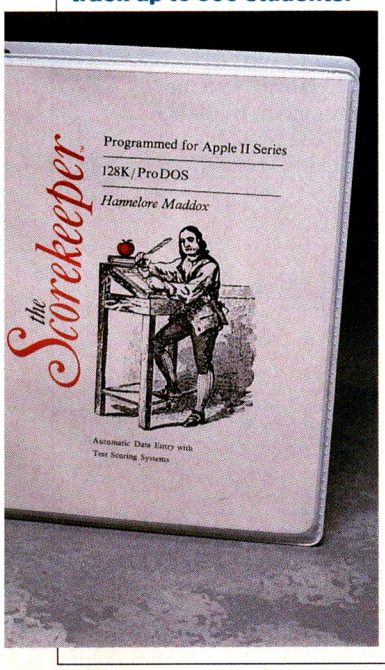
DINOSAURS ARE FOREVER

Dinosaurs Are Forever is an Electric Crayon Deluxe computer coloring book. The program teaches children how 26 different dinosaurs evolved, their approximate weight and size, and their eating habits. It also offers custom banner, calendar, and poster making. You can design a banner with your colored picture printed at each end and a personal message in the middle. It also lets you write your own message to appear below your work of art or print the picture with the computer-supplied description that teaches you all about the dinosaur you've just colored. Sixty-four colored stickers are included.
List Price: $29.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive; printer recommended. ProDOS; not copy-protected.
Polarware
1055 Paramount Pkwy.
Suite A
Batavia, IL 60510
(800) 323-0884 or
(312) 232-1984
CIRCLE READER SERVICE NO. **506**

Dinosaurs Are Forever, a computer coloring book



Scorekeeper lets you track up to 500 students.



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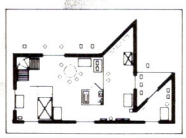
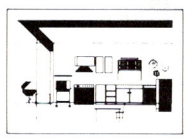


With ***Architecture*** draw floor plans, side views and structural details. Standard Apple II version: $69.95; IIgs-specific: $89.95

Interiors



Arrange and furnish your room with ***Interiors***, then try out color schemes. Automatic side views. Standard Apple II version: $69.95; IIgs-specific: $89.95

Landscape

Enhance your environment and create the perfect ***Landscape***. Automatic side views, shopping lists, aging of trees. Standard Apple II version: $69.95; IIgs-specific: $89.95

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CIRCLE 227 ON READER SERVICE CARD

PRODUCT ROUNDUP

SOFTWARE

THE FOOD PROCESSOR II

The Food Processor II is a nutrition and diet-analysis program. It calculates nutrients in diets, recipes, and menus from an encyclopedia of nutrition information and 2400 foods, including fast foods and 30 nutrients. The database includes recent USDA data and 350 additional sources of information. The program analyzes what you should eat, personalized for your age, weight, sex, height, and activity level. It compares food analyses to recommended amounts, in bar graph and numerical form.
List Price: $250
Requires: Apple II Plus or IIe with 80-column card, IIc, or IIGS; 128K RAM; two 5¼- or 3.5-inch disk drives. ProDOS; not copy-protected.
ESHA Research
P.O. Box 13028
Salem, OR 97309
(503) 585-6242

CIRCLE READER SERVICE NO. **507**

TAO MASTER

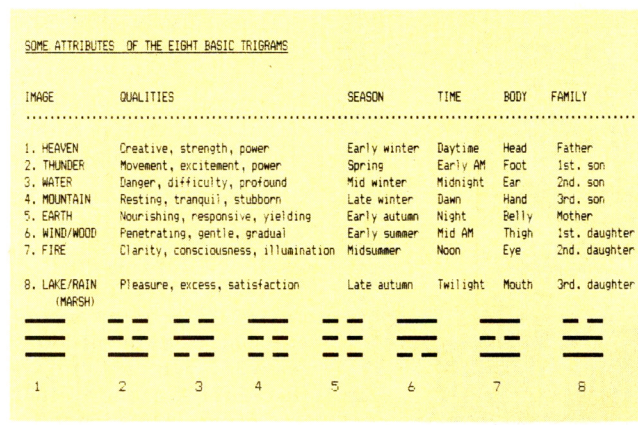
Tao Master is an interactive game that answers your questions on all aspects of life. It is based on the ancient Chinese *I Ching* or *Book of Changes* and gives answers based on a randomly produced hexagram. The package includes a notebook disk for your personal comments and for keeping a record of each round of play. The program also comes with a demo, handbook, quick-reference card, warranty/registration card, and hexagram guide.
List Price: $19.95
Requires: Apple IIe, IIc, or IIGS; 128K RAM; one 5¼-inch disk drive. ProDOS; not copy-protected.
Intervision Software Company
2402 Shenandoah Street #7
Los Angeles, CA 90034
(213) 836-4643

CIRCLE READER SERVICE NO. **508**

MEDICAL AND DENTAL INSURANCE FORMS

Andent, Inc. has released two new insurance-form writers for the Apple II. The Medical Insurance Form Writer allows you to prepare Universal Health Insurance Claim Forms, and the Dental Insurance Form Writer lets you prepare Universal ADA Insurance Claim Forms. You can save, edit, and print these forms and create a master form for each patient/family and save it for later use.
List Price: $100
Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM; one 5¼-inch disk drive. DOS 3.3; copy-protected.
Andent, Inc.
1000 North Avenue
Waukegan, IL 60085
(312) 223-5077

CIRCLE READER SERVICE NO. **509**



Tao Master, based on the ancient Chinese *I Ching*

PRODUCT ROUNDUP

ARRAGON

Arragon is a mathematics game for students in grades K–3 or for remedial students. The program combines graphics and interactivity and is designed for use at home or school. A *Teacher/Parent Guide* contains instructional activities that coordinate with graphics on the computer screen.
List Price: $39
Requires: Apple II Plus, IIe, IIc, or IIGS; 48K RAM; one 5¼-inch disk drive; color monitor recommended. DOS 3.3; copy-protected.
Learning Research, Inc.
Technology for Knowledge
1065 Park Ave., Suite 8D
New York, NY 10128
(212) 534-5402
(212) 996-1474

CIRCLE READER SERVICE NO. **511**

THE VOCABULARY OF COMPUTER SCIENCE

The Vocabulary of Computer Science is for computer-literacy classes in grades 7–10. Working alone or in groups, students try to identify "mystery words," using a series of clues provided by Professor Focus. This learning game aids in the development of vocabulary, spelling, word recognition, and concepts. Teachers can use the vocabulary on the disk or create their own list of words and clues by using an editing feature.

Focus Media's game helps students learn computer vocabulary.

The program contains vocabulary on the following topics: History of Computers, Computers and Society, Computer Hardware, Computer Programming, and Software Applications. Included with the program disk is a backup disk and a teachers' lesson planner with student worksheets.
List Price: $45
Requires: Apple II Plus, IIe, IIc, or IIGS; 64K RAM; one 5¼-inch disk drive. DOS 3.3; copy-protected.
Focus Media, Inc.
839 Stewart Avenue
Garden City, NY 11530
(800) 645-8989
In NY, AK, and HI call collect (516) 794-8900

CIRCLE READER SERVICE NO. **512**

LESSON MASTER

Lesson Master is a courseware-generating package for teachers of young children as well as learning-impaired and physically disabled students ages 5 and up. The program allows teachers to create match lessons, timed repeated-reading lessons, and voice/text-decoding lessons.

Match lessons allow you to use text, numbers, voice, and the 96 built-in Dolch noun graphics. The timed repeated reading allows you to use the program's mini-processor or another word-processing program to create a story and comprehension questions based on it. Decoding lessons give students practice in reading individual words as they hear them spoken in your digitized voice.
List Price: $79
Requires: Apple II Plus, IIe, IIc, or IIGS; 64K RAM; two 5¼-inch disk drives (to create lessons); one 5¼-inch disk drive to play back; joystick or alternate input devices optional; SuperTalker card for digitized voice (II Plus and IIe only). DOS 3.3; not copy-protected.
Simpac Educational Systems
Suite 11C
1105 North Main Street
Gainesville, FL 32601
(904) 376-2049

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DIVERSI-TUNE™

A New Breakthrough In Computer Music!

If you love music, and have an Apple //gs, you're going to ABSOLUTELY LOVE **Diversi-Tune**! Wait, I can prove it. Send me 2 crisp $1 bills and your address, and I'll send you back a **Diversi-Tune** 5.25" sing-a-long demo disk ($2 mail only/$5 phone order).

Diversi-Tune unlocks the full musical potential of the //gs sound chip for the first time. In a word, it sounds INCREDIBLE, on ANY Apple //gs! And **Diversi-Tune** plays REAL music, recorded by REAL humans.

With **Diversi-Tune**, you can actually add words to ANY song, even songs on records, tapes, or CD's! Use **Diversi-Tune** to make sing-a-long videotapes of your favorite records, and follow the **Diversi-Tune** "bouncing ball". It's fantastic for teaching songs in music classes, school holiday programs, or for family sing-a-long parties.

Diversi-Tune is a 2-port, 32-channel in/out, 5-msec resolution, MIDI recorder, with overdub, and punch-in/out audio editing, combined with a 32-voice polyphonic, 128-instrument, multi-timbral, stereo MIDI synthesizer, with 88-key piano, or "bouncing ball" lyrics display.

Whew! If you didn't understand that, it just means a lot of great musicians are going to record a lot of great songs for you to play on your Apple //gs. If you DO understand it, stop drooling and send for **Diversi-Tune**!

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Diversified Software Research, Inc.
34880 Bunker Hill
Farmington, MI 48331-3236 dsr

CIRCLE 310 ON READER SERVICE CARD

New! EasyDrive & RAMUP 4.0
The Storage Management Team

If only I had storage management software that could give me complete control of my hard-disk by installing itself onto my hard-disk and then installing my programs automatically . . .
. . . it could have a menu where I could choose the applications I want by just touching a key . . .
. . . it could run programs, remove programs, back up, restore, index, copy, and other stuff, too, automatically. And it could be incredibly fast and easy to use.

And there could be another program just like it, for my RamCard. It could load my programs onto my RamCard and present them to me on a menu . . . and I could flip from program to program like turning a page . . . and would have great features like autoload, back up, restore and statistical displays. And it could be incredibly fast and easy to use.

And they could work together to give me the greatest storage management system ever . . .
. . . and come with a manual that could explain ProDOS in a way that even I could understand . . .
. . . and be sold and serviced by friendly people . . . and be affordable . . .

Your prayers are answered.

You need powerful storage management. It's an absolute must for today's Apple user. Having a RamCard and/or Hard-Disk is great, but unless you can use them with speed and ease, you're not doing yourself any favors.

EasyDrive (for the Hard-Disk) and RAMUP 4.0 (for the RamCard) are the ONLY utility programs of their kind — bringing speed and manageability to your computer — bridging the gap between you and your Hard-Disk/RamCard.

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ENTERTAINMENT GAMEPORT

BY BOB LINDSTROM

Two arcade games let you zap aliens—past and future—and a new book clues you in.

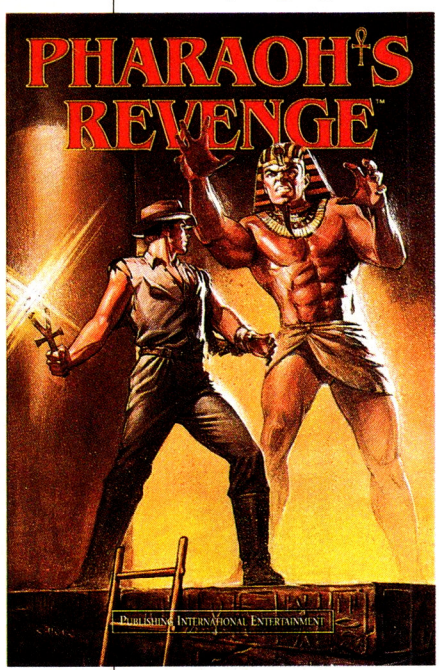
PATRIOTIC FERVOR

Is this a great country, or what?

During the first weekend of July, sons and daughters of liberty throughout the U. S. of A. revived their patriotic fervor by staging river-side beer busts; blowing the lids off trash cans; and gritting their teeth into delicious picnics of cold, oily fried chicken.

These are inalienable rights reserved only for the American People. What Soviet soldier marching through Red Square wouldn't trade in his vapid show of military muscle for the chance to toss an empty Pepsi can into the Mississippi or crush out a Marlboro in the sands of Malibu Beach?

This summer, though, the "rockets' red glare" isn't just that artificial fireball chasing the neighbor's cat down the street. It's also a pair of arcade action games for the Apple IIe, IIc, and/or IIGS that make "bombs bursting in air" seem as mundane as the pop of a flip-top tab.



Pharoah's Revenge is an irresistible arcade-style game for the Apple II.

Egyptian Vacation

Before America came along to make such historic cultural contributions as drive-up convenience stores and no-fault chili dogs, the ancient Egyptians were passing off pyramids as high civilization. All that funereal gold, all that sand, and not a 48-ounce cola in sight. Check your priorities, Tut.

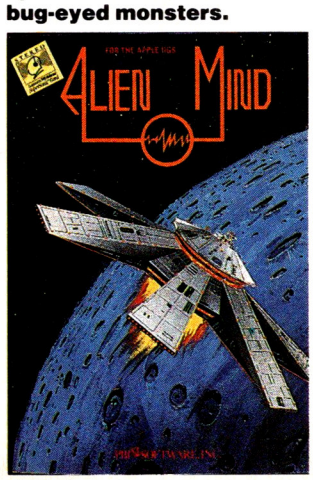
And then, those mummies snoozed the nap of the dead as raiders robbed their crypts of treasure.

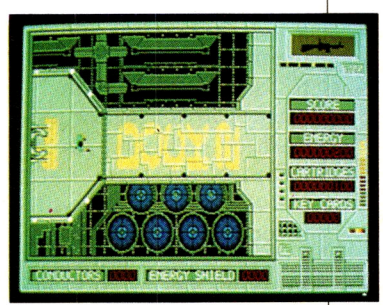
You won't be sleeping the sleep of the ancients once you've loaded Pharaoh's Revenge from Software Resources International. In fact, you might find it hard to get any sleep at all.

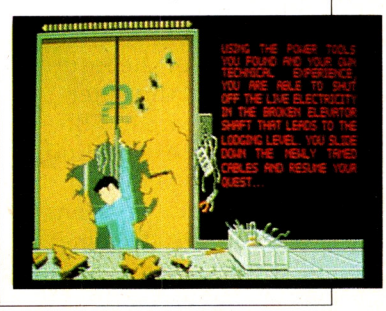
Programmer/designer Ivan Manley has gone several fast-paced steps beyond Lode Runner to create one of the most irresistible and replayable Apple IIe/c/GS arcade games to appear in ages.

There's nothing a free-

Alien Mind's crisp graphics (right) take you deeper and deeper into an endangered space installation full of bug-eyed monsters.







GAMEPORT

Fire up your Apple to harass foreign cultures of the past or wipe out alien cultures to come.

dom-loving Yankee Doodle likes better than running roughshod through the cultures of the world—just ask any tourist who's ordered a cheeseburger on the Champs Elysée. In Pharaoh's Revenge, you get to race around an Egyptian pyramid snatching valuable ankhs (ancient symbols of life) while evading the wrath of a mummified ruler.

The side-view screens resemble the multilevel platforms of Brøderbund's Lode Runner. Where Lode Runner required you to complete one screen at a time, however, Pharaoh's Revenge allows you to duck into the next screen when you escape the mummy's curse. To move to the next level, you must grab and stack ladders, evade the angered Pharaoh, and gather all the ankhs from several interlocking screens.

The game is simple to understand and impossible to leave.

In-Alienable Rights

Patriots of the future can defend the outer edges of space in PBI Software's Alien Mind, a IIGS action game that links the movie Aliens with the arcade game Gauntlet.

It seems that a scientific experiment gone wrong in a distant space station has unleashed a menagerie of renegade mutants that instantly killed every human in sight. (When's the last time you met a mutant alien that just wanted to play a nice hand of Hearts?) With your customary disregard for life, limb, and good sense, you dive into the station to rescue the last remaining scientists.

Programmer Robin Kar and artist Matthew Crysdale have designed a multilevel space installation that grows more challenging as you plunge ever deeper into its swarming innards.

When you're wandering the wide-open spaces of the first-floor reception area, alien hunting is relatively clear-cut: shooting over naugahyde sofas, tripping on dead bodies, and hiding behind walls.

On the other hand, when you reach the cargo level, stacks of packing cartons create a narrow, puzzling maze of dead ends and blind alleys. Just don't get cornered by one of the more than 120 monsters that creep through the top-down view of the surroundings.

Just so Alien Mind won't fall prey to the fast-shooting monotony that afflicts Gauntlet, Kar and Crysdale have incorporated some role-playing puzzle solving that involves signing onto the installation's computer system and communicating with one of the endangered scientists.

With crisp graphics and loads of bug-eyed monsters, Alien Mind reasserts the fact that all men are created equal—but aliens watch out!

So get busy, "GamePort" patriots. Keep the spirit of the 4th alive. Grab those rays, wolf down those picnics, and remember what made this country great. And between those displays of chauvinistic enthusiasm, take time to fire up the Apple to harass foreign cultures of the past or wipe out alien cultures yet to come.

And that's why I'm proud to be an American.

NEW CONVERTS

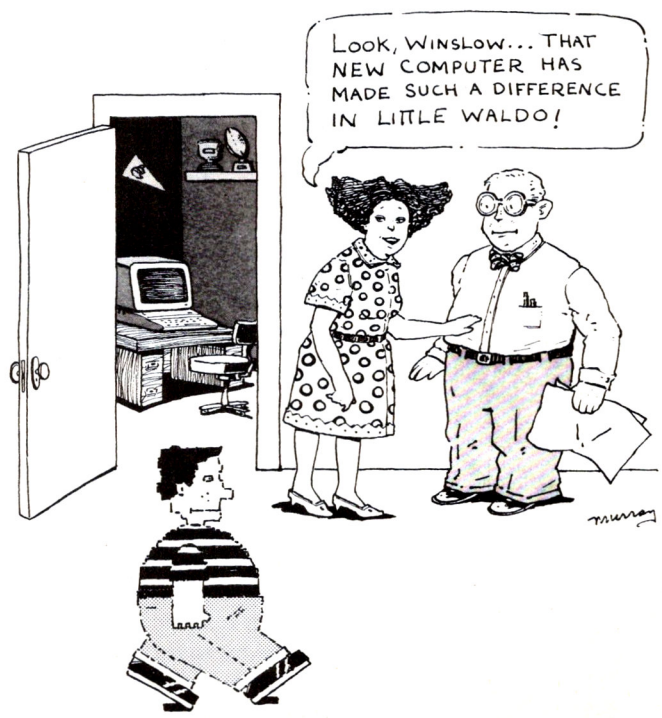
The disk wars have begun. After Ultima V appeared on eight disk sides and claimed the title of largest Apple game of all time, King's Quest III is appearing for the IIe/c/GS on ten disk sides.

But who's counting? No matter what the disk count, the arrival of King's Quest III for the Apple II line is great news for Apple owners who want to continue their traversal of designer Roberta Williams' ongoing series of animated adventures from Sierra On-Line.

Vegas-bound IIGS owners may want to brush up

BY TOM MURRAY

LAUGHTRACK



GAMEPORT

Quest for Clues *has solutions that you'll find nowhere else.*

their gambling skills with Microillusions' Blackjack Academy, a graphically colorful version of 21. Functioning as coach as well as computerized competitor, Blackjack Academy offers advice on strategy, money management, and card counting.

Also on the conversion charts is a IIGS version of Activision's The Last Ninja. This animated arcade/adventure game boasts elegantly detailed graphics, digitized sound, and a scenario that combines role playing with martial-arts combat.

MORE HELP FOR THE ADVENTUROUS

Origin Systems, publisher of the Ultima series and several other popular role-playing and adventure games, has spread more than its share of entertaining frustration into the world. International adventurers often have threatened to crush their computers into molecular residue when facing some of the more potent puzzles in the Ultimas or Autoduel.

Now, Origin pays penance by publishing *Quest for Clues*, a $24.95 gathering of 50 hints and walk-through solutions edited by Shay Addams.

Addams and his colleagues have arrived at an interesting way of putting both hints and walk-throughs in a single text entry. Key words in the solution are encrypted in a simple substitution code reprinted in the back of the book. Your straying eyes may scan at will, but unless you've made a conscious effort to decode the encrypted words, you won't accidentally read a solution. It's a fine device for pure-hearted adventurers who wouldn't think of cheating—but it's frustrating for the impatient.

Although the book's cover claims that *Quest for Clues* is a substitute for the rather expensive clue books available for such games as the Infocom adventures, The Bard's Tale I and II, and the Ultimas, Addams cheats a little, perhaps in deference to Origin Systems. The entry for Ultima IV gives many hints but is short on maps. If you want full Ultima IV maps, you'll still have to purchase the Ultima IV clue book.

On the positive side, *Quest for Clues* has solutions that you will find nowhere else.

Among the products for which it offers solutions are Amnesia, Autoduel, Ballyhoo, Bard's Tale I/II, Bureaucracy, Leather Goddesses of Phobos, The Lurking Horror, Might and Magic, Moebius, Phantasie I/II/III, Space Quest, and Stationfall. ✚

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ENTERTAIN

A Japanese arcade game, sandlot baseball, schoolyard basketball, and World War II bombing raids come to your Apple's screen.

MADE IN JAPAN

Ah, Japan. That mysterious land of lotus blossoms, samurai warriors, geishas, sumo wrestlers, green tea, sake, haiku, origami, kabuki, and hara-kiri.

Japan, that inscrutable country that gave us sushi, Toyotas, karate, Sony, Godzilla, quality circles, Walkman radios, and paper clothing.

Now, direct from that very same place, comes the latest Japanese assault on American pop culture: their best-selling arcade game Thexder. (According to Sierra On-Line, its stateside publisher, Thexder, programmed by S. Uesaka and H. Godai, has sold well over a half-million units in Japan.)

But if Thexder makes it to some American computer hall of fame, it will be for only one reason: It is the first arcade game released only for the Apple IIGS and not for the rest of the Apple II series. Exploiting the capabilities of the IIGS in the visual/aural areas, it excels (finally!), rivaling the stand-up machines of video arcades. In fact, most of the praise Sierra On-Line has received from game players for this adaptation focuses on its sensational graphics and nonstop musical score.

So what is Thexder? Thexder is a "hyper dual-armor Robot-Jet transformer." Translated into plain English: Sometimes Thexder is a robot-man, sometimes it's a jet fighter, and it can change from one to the other at will. When you start playing, you (as Thexder's pilot) are locked in a strange maze-like world populated by several different types of alien creatures. Your only visible means of escape is to the right, so off you go.

Battling the alien creatures requires becoming familiar with the various types and how best to handle them. Some aliens are better left alone, and others actually benefit you if you dispose of them. For instance, you constantly have to keep watch on Thexder's energy level, conserving it at all costs. Well, killing certain creatures either increases Thexder's remaining energy or increases the maximum possible energy (a boon to you if you can discover which do which).

In all, you have 16 different levels to explore, with the challenge increasing as the game progresses. The game's packaging promises that "the battlefields include caves, vast cargo holds and spaceship interiors." The first four levels share a similar nondescript design, however; although beautifully constructed, they all look alike. But then the fifth level (the highest I was able to achieve) changes dramatically, revealing itself as the promised cave level.

Now, I love arcade games. I've amassed quite a collection, and I've always been a sucker for dazzling graphics. The games I've enjoyed playing almost exclusively for their visual splendor are Threshold (one of the first Sierra On-Line games) and the more recent Airheart. I also appreciate a challenging game, though, so I usually play Robotron 2084 to provide this aspect.

Thexder would easily supplant each of the three previous games in my affections, were it not for its method of game control. The three other

MENT REVIEWS

games are easy to control with a joystick. Thexder uses the keyboard; more specifically, you control game play by using the numeric keypad. Complete instructions are in the leaflet that comes in Thexder's packaging, and the movement controls are logically laid out. I always find keyboard controls much harder than joystick control, though, and I have a built-in resistance to learning them. (I do know many people who actually prefer keyboard controls, finding them to be much more precise than the joystick.)

You get only one Thexder robot per game. If disaster strikes, you must start the game over. And you will start over, for even though Thexder is quite difficult, it definitely has that "let-me-try-just-once-more" addictive quality to it. But that addictiveness only shows up once you have a handle on the controls—and only if frustration doesn't rear its ugly head first.

The accompanying musical score, although technically impressive, tends to be overpowering and repetitious. Fortunately, you can turn off both the music and the sound effects independently of each other.

One more comment: Thexder is not self-booting. You must first boot your Apple IIGS system disk, wait for it to load, and then insert the Thexder disk and wait for it to load (after doing the double-click routine) before you can start playing. An insurmountable obstacle? Of course not. Annoying? Absolutely.

Thexder will not be the only arcade-type game to be exported from Japan. Sierra On-Line is planning to issue more in the near future. If the new games are of the same quality as Thexder, Apple IIGS game players should start saving their yen now! And if the Japanese can develop a "watchman-wrist-TV," don't you think they can find a way to implement good joystick controls in their games? I'm crossing my fingers.

Donald Oliver

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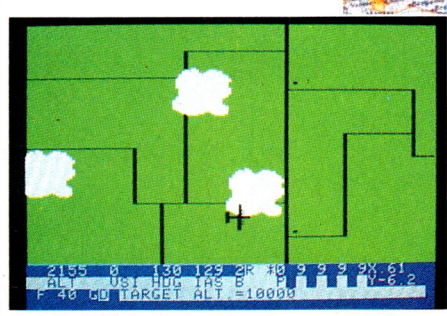

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HIT THE STREETS

Epyx has come out with an imaginative wrinkle on an old theme. The Street Sports series puts you back in the sandlots, parking lots, back alleys, and playgrounds. Old tires may serve as bases, and potholes and bushes may become unexpected obstacles in these games.

Street Sports Baseball, the first title in the Street Sports series, features a choice of vacant lot or parking lot for the playing field. The vacant lot is well populated with rocks, trash, and other dangers, and the bases are made of trash-can lids, old boxes, and so forth.

The most colorful part of the game, however, is the roster of 16 potential All-Stars—players such as Radar, who knows where the ball is going at all times; Vic, who thinks he's a Don Johnson look-alike; and Kim, "a real free-spirited girl," who tends to lose concentration in the outfield. Most of the players are strong in one area and weak in another.

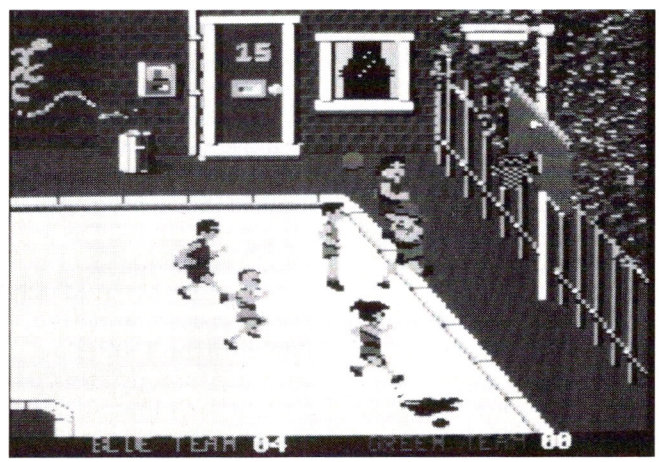
You can use this motley crew in various ways. You can have the computer select random teams, or you can select your own lineup. If you select your own, you must flip a coin with your opponent (human or computer) and then take turns selecting. The first ones picked are the best players. By the time you reach the last few, you end up with players who strike out a lot and can't run or throw or catch—well, you get the picture. They probably have great personalities.

Once the rosters are set, you can select fielding positions and batting order. Then, if you like the teams, you can save them to disk and use them later.

Finally the real game begins. When you're at bat, you have little to worry about. You watch the pitch on a split screen. The left portion shows a ¾ aerial view from behind the plate, while the right side shows a view from directly above the pitcher and batter. If you can watch both screens at once (I have trouble with it), you can see where the pitch is going from two angles, which should, theoretically, help you hit the ball. On the other hand, watching just the left side of the screen, I didn't have too much trouble hitting.

The Street Sports series puts you back in the sandlots, parking lots, back alleys, and playgrounds.

Running the bases is automatic for any forced runners, but you can gain extra bases by holding down the joystick button. If the play at a base is close, you pull down on the joystick to slide in.



A screen from Epyx's Street Sports Basketball

On the fielding side, things can get more complicated. First, you must pitch. Since you can control the ball all the way to the plate, you want to vary the pitches, some outside, some inside, some wiggly—fast and slow. You can't pitch high or low, however. I wasn't very good at striking out opposing batters, so my fielders got a lot of work.

When the ball is hit, you see it fly from the bat, and you see a small image of the whole field. A status line informs you what kind of hit it is (infield grounder, outfield fly, and the like) while you position your fielder near the ball's destination. Unfortunately, the standard fielders' position in this game is with the hands covering the eyes, but with some adroitness, you can maneuver the cowering fielder under a fly ball for an out. Beware, you may have to work your way around tree stumps, puddles, and other pitfalls, or your fielder will fall and become even less useful than usual.

Since players' speed and arm strength vary, throwing a runner out depends on who is running and who is throwing. In the time it takes some runners to make it to first base, others may already be halfway to third.

The game is entertaining and graphically appealing, although it lacks some of the detail of other computer simulations. For instance, you can't change pitchers, use pinch hitters, steal bases, or pitch out to first base. The lack of base stealing and pitchouts waters down the wild and wooly atmosphere this game suggests. And the general play of the game is otherwise not much different from that of other baseball simulations.

If I had to choose only one baseball simulation, I'm not sure Street Sports Baseball would be it, but

The standard fielder's position is with the hands covering the eyes.

for those who really enjoy this sort of simulation, the program is enjoyable, and the atmosphere is lighthearted enough to bring a smile to your lips, even when you lose.

A Few Hoops

Hard on the heels of Street Sports Baseball comes Street Sports Basketball, a rough-and-tumble school-yard/back-alley sort of basketball simulation. (Also available in this series is Street Sports Soccer, not reviewed here.) In fact, this program includes four playing fields: school yard, back alley, parking lot, and suburb (with lawns and sidewalk curbs to contend with)—and three skill levels for playing against the computer: easy, intermediate, and tough. Alternatively, you can play against a human opponent.

Ten urchins are available, although only three play on each team, meaning that some of the less agile players are habitually left on the sidelines. Unlike in the baseball game, you choose sides each time, and you can't save teams. Oh, and some of the familiar players are back—such as Magic, Vic, and Radar.

After the tip-off, you control one player at a time. If you have the ball, you control the ball carrier. You can dribble, pass (by pressing the joystick button while facing a teammate), or shoot (if you are close enough to the basket). If you are on defense, you can change the active player by holding down the button, steal the ball, or block shots. Your other players move around in a defensive posture, generally impeding the other team's progress but not really doing a very good job.

You view one-third of the court at any time, and as one team advances the ball toward its goal, the scene shifts. The most difficult part of the game is the outlet pass and getting the ball out of the opponent's side of the court. I found myself running up high scores against the computer by stealing a pass in my own end and then dunking the ball.

Although I enjoyed the game a lot, I found it fairly easy to win against the computer—I recommend a human opponent. On the other hand, if no one is handy and you crave a greater challenge, pick a crummy team. You'll have to work a little harder.

Rusel DeMaria

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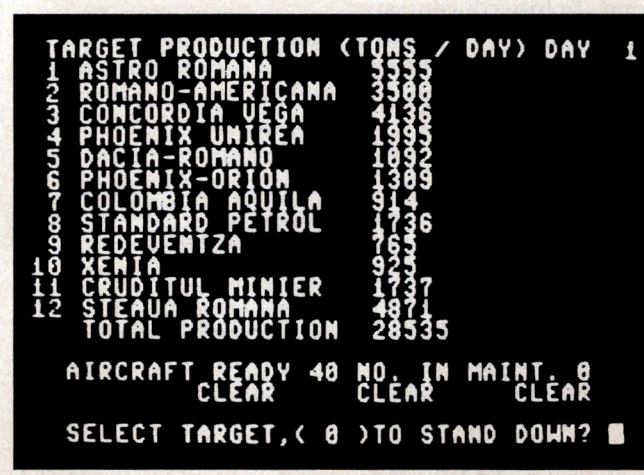
B-24 from Strategic Simulations doubles as a flight and combat simulator. You pilot a B-24 Liberator bomber and, as group leader, command 40 B-24s on missions to 12 actual World War II targets. (Strategic Simulations refers to B-24 as a "flight emulator.")

The game, set in March 1944, is based on raids flown by the 460th Bombardment Group from its airfield in Spinazzola, Italy. The objective is to knock out the oil refineries surrounding Ploesti, Rumania.

Military pilots say that combat flying consists of hours of boredom, punctuated by moments of stark terror, and this description is true of B-24. Much of the flying that the game duplicates is routine: joining with other bombers and fighters, navigating to rendezvous points, and then navigating to the target. SSI has incorporated a feature that lets you accelerate the time factor to quickly get to the target area.

Things happen with rapid-fire intensity as you near the target, however. Fighters attack, followed by heavy antiaircraft artillery (flak) as you start your bomb run. In this game, flak is your greatest enemy. As a pilot, you'll fret over shot-up engine superchargers, oil leaks, and dead engines. As group leader, you cringe when the message B-24 GOING DOWN appears, because each airplane lost means fewer



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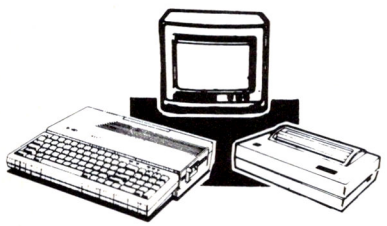

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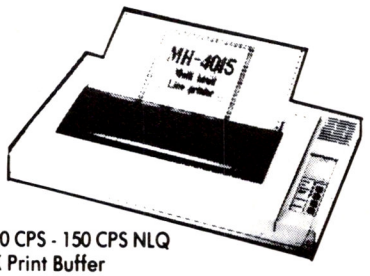

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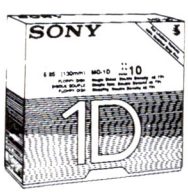

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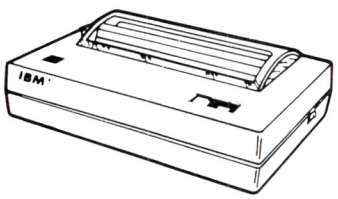

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Finally, you must land your bomber back at one of your bases, and getting this lumbering Liberator onto the runway is no picnic. You'll sweat every approach and learn that there is no such thing as a routine landing.

An interesting facet of the game is its campaign feature, a series of 19 missions flown against 12 targets to reduce oil-refinery production as close to zero as possible. On completion of the campaign, the computer will evaluate your overall performance in relation to the missions the real 460th Bombardment Group flew and tell you how much your campaign may have shortened or lengthened the war.

B-24 Release 1.0 was developed from the Commodore version. Apple players have no joystick option, which makes the flight-simulator aspects of the program more difficult to master—strictly keyboard flying.

The documentation is good and takes you through all aspects of the game in a step-by-step fashion. It references a Commodore keyboard and includes an Apple Data Card that indicates which operating keys are different from those in the handbook. Also in the package is a map and actual WWII mission data concerning the raids.

The game is stronger as a combat simulator than a flight simulator, which should be no surprise, since SSI is noted for strategy simulation. If you like detail work such as planning and navigating, you'll like this game. If you are looking for 3-D graphics and shoot-'em-up action, you may be disappointed.

Mark DuCharme

B-24
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A/D SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

D/A SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

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FEATURES

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The I/O manual includes many programs for inputs and outputs.

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Cocaine lies.

After nearly a decade of being America's glamour drug, researchers are starting to uncover the truth about cocaine.

It's emerging as a very dangerous substance.

No one thinks the things described here will ever happen to them. But you can never be certain. Whenever and however you use cocaine, you're playing Russian roulette.

You can't get addicted to cocaine.

Cocaine was once thought to be non-addictive, because users don't have the severe *physical* withdrawal symptoms of heroin—delirium, muscle-cramps, and convulsions.

However, cocaine is intensely addicting *psychologically.*

In animal studies, monkeys with unlimited access to cocaine self-administer until they die. One monkey pressed a bar 12,800 times to obtain a single dose of cocaine. Rhesus monkeys won't smoke tobacco or marijuana, but 100% will smoke cocaine, preferring it to sex and to food—even when starving.

Like monkey, like man.

If you take cocaine, you run a 10% chance of addiction. The risk is higher the younger you are, and may be as high as 50% for those who smoke cocaine. (Some crack users say they felt addicted from the *first time* they smoked.)

When you're addicted, all you think about is getting and using cocaine. Family, friends, job, home, possessions, and health become unimportant.

Because cocaine is expensive, you end up doing what all addicts do. You steal, cheat, lie, deal, sell anything and everything, including yourself. All the while you risk imprisonment. Because, never forget, cocaine is illegal.

There's no way to tell who'll become addicted. But one thing is certain.

No one who is an addict, set out to become one.

C'mon, just once can't hurt you.

Cocaine hits your heart before it hits your head. Your pulse rate rockets and your blood pressure soars. Even if you're only 15, you become a prime candidate for a heart attack, a stroke, or an epileptic-type fit.

In the brain, cocaine mainly affects a primitive part where the emotions are seated. Unfortunately, this part of the brain also controls your heart and lungs.

A big hit or a cumulative overdose may interrupt the electrical signal to your heart and lungs. They simply stop. That's how basketball player Len Bias died.

If you're unlucky the first time you do coke, your body will lack a chemical that breaks down the drug. In which case, you'll be a first time O.D. Two lines will kill you.

Sex with coke is amazing.

Cocaine's powers as a sexual stimulant have never been proved or disproved. However, the evidence seems to suggest that the drug's reputation alone serves to heighten sexual feelings. (The same thing happens in Africa, where natives swear by powdered rhinoceros horn as an aphrodisiac.)

What is certain is that continued use of cocaine leads to impotence and finally complete loss of interest in sex.

It'll make you feel great.

Cocaine makes you feel like a new man, the joke goes. The only trouble is, the first thing the new man wants is more cocaine.

It's true. After the high wears off, you may feel a little anxious, irritable, or depressed. You've got the coke blues. But fortunately, they're easy to fix, with a few more lines or another hit on the pipe.

Of course, sooner or later you have to stop. Then—for days at a time—you may feel lethargic, depressed, even suicidal.

Says Dr. Arnold Washton, one of the country's leading cocaine experts: "It's impossible for the nonuser to imagine the deep, vicious depression that a cocaine addict suffers from."

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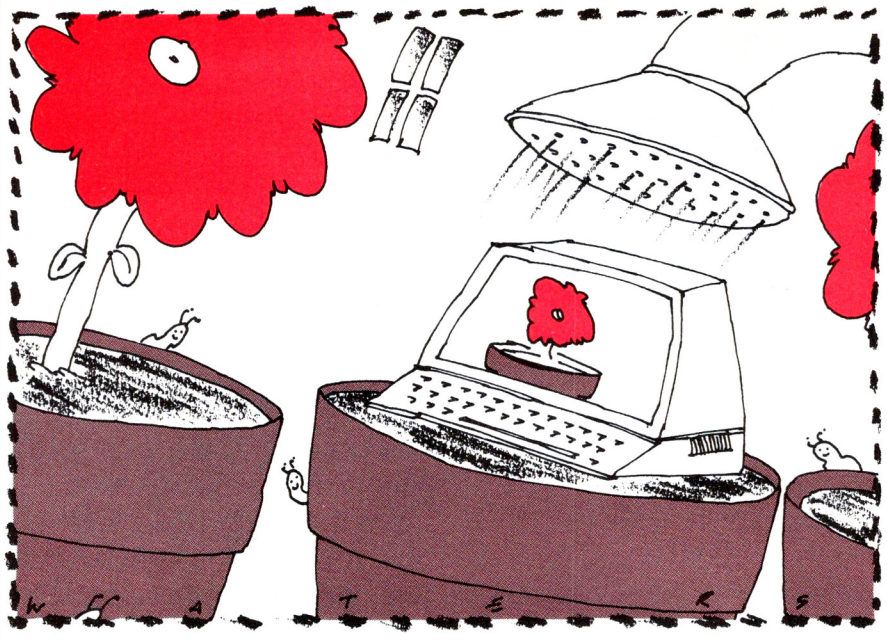

TIPS AND TECHNIQUES

DOUBLE-STRIKE PRINT SHOP

Have you ever wished that you could double-strike printouts when using Brøderbund Software's Print Shop? Well, now you can, if you have the color version of The Print Shop.

First, from the main menu, enter the Setup mode and select your printer type. When the program asks you what type of ribbon you are using, choose either three- or four-color, even though your printer actually has a single-color ribbon installed. Complete the Setup process by faithfully answering the remaining questions.

Now, when you're designing your greeting card, for example, set the border, graphic, and font colors all to the same nonprimary color; orange, purple, or green will do just fine. (You will not have this option if you choose a Ready-Made design.) Since these colors do not appear on most multicolor ribbons, the computer must "mix" the available primary colors by making two passes of the printhead. Because you have a single-color ribbon installed, however, you effectively get double-strike printouts, great for when you're using a worn ribbon.

This technique definitely works with the ImageWriter II, but it may not work with some noncolor printers or those that force you to install a multicolor ribbon.

TOM HOWE
SARATOGA, CA

IIGS TOOL-SET INFORMATION

The Apple IIGS Launcher on recent releases of the System disk is able to display a list of tool sets and their version numbers. When the Launcher dialog box is on the screen, hold down the open-apple key and click the mouse on the word *Version* in the lower left-hand corner of the dialog box. Doing so produces a complete list of tool sets available in ROM and RAM, with version numbers displayed to the right. Version numbers followed by the letter *P* indicate that that tool set is still in the prototype phase.

MORGAN DAVIS
LA MESA, CA

CHANGING THE STARTUP NAME

You can use the program in figure 1 to change the name of the Applesoft program that BASIC.SYSTEM runs when it first starts up. The default name is STARTUP. The program works with BASIC.SYSTEM versions higher than 1.0.

YOAV KATZ
QIRYAT BIALIK
ISRAEL

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```
 10 D$ =  CHR$ (4):F$ = "BASIC.SYSTEM":LC = 8198
 20 PRINT D$;"UNLOCK";F$
 30 PRINT D$;"BLOAD";F$;",A$2000,TSYS"
 40 PRINT "Name of old boot program: ";
 50 L =  PEEK (LC): FOR I = 1 TO L: PRINT
    CHR$ ( PEEK (I + LC));: NEXT : PRINT
 60 INPUT "Enter name of new boot program: ";A$
 70 IF A$ = "" THEN  END
 80 L =  LEN (A$): IF L > 15 THEN  END
100 POKE LC,L
110 FOR I = 1 TO L: POKE I + LC,
    ASC ( MID$ (A$,I,1)): NEXT
120 PRINT D$;"BSAVE ";F$;",A$2000,TSYS"
```

Figure 1: How to change the name of the BASIC.SYSTEM startup program

ILLUSTRATION BY THOMAS WATERS

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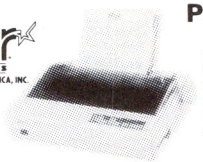

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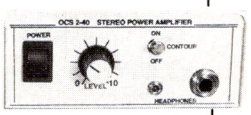

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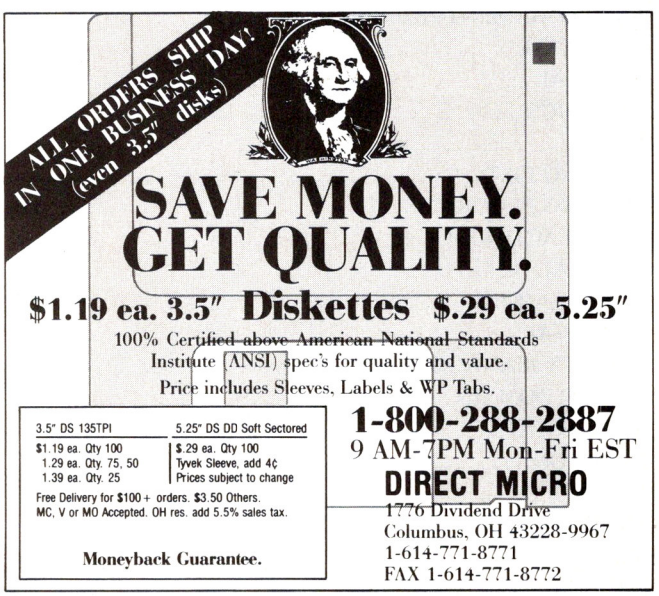

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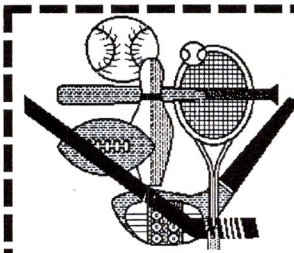

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(Continued from page 120)

SHARING A DRIVE

Q. *I own an Apple IIe and an Apple IIGS. My parents use the IIe for their businesses, and I use the IIGS for programming and homework. We would like to buy a 40Mb hard-disk drive to connect to both computers at once. Does such a drive exist?*

E. MAINI
TRUMBULL, CT

A. You can use any of the Apple II hard-disk drives from CMS Enhancements of Tustin, California ([714] 259-9555), as long as you also buy a CMS SCSI card for each computer. If you do share a hard disk in this way, however, you should not try to access it from both computers at the same time, as you could easily corrupt the file structure on the medium.

USING MOUSETEXT

Q. *I own an Apple IIe, but I don't have a mouse or mouse card. Can I print mouse characters on the screen and, if so, how?*

COLBY O'DONNELL
MONITOR, WA

A. The character set you're referring to is called MouseText and is stored in the keyboard ROM of the IIGS, IIc, and enhanced IIe. As figure 1 shows, it comprises 32 unique icons. You do not need a mouse to use this character set, although the icons it contains are useful for displaying the windows and pull-down menus often present in mouse-based programs.

To display MouseText characters from inside an Applesoft program, first enable the 80-column screen with the `PR#3` command. Then turn on the inverse display mode with a `PRINT CHR$(15);` command and enable the MouseText character set with `PRINT CHR$(27);`.

Now you must print the ASCII character corresponding to the MouseText icon you want to display. Figure 1 shows the correspondence of icons to standard ASCII characters.

Finally, turn off MouseText with `PRINT CHR$(24);` and return to the normal display mode with `PRINT CHR$(14);`.

For example, here is a program line you can use to display a file folder on the screen:

```
100 PRINT CHR$(15);CHR$(27);"XY";
CHR$(24);CHR$(14);
```

GAME-PORT ADAPTER OPTIONS

Q. *I have a Koala Technologies Corporation Muppet Learning Keys keyboard, which plugs into the DB-9 game connector on the back of my IIe. My joystick also uses this connector, so whenever I want to play a game, I have to remove the Muppet keyboard first. Is there an adapter I can buy that will let me easily switch between the joystick and Muppet keyboard?*

MAJOR DAVID KLUBECK
FORT WAINWRIGHT, AK

A. Southern California Research Group ([800] 635-8310; [805] 529-2082) sells a variety of game-connector adapters. You need their Paddle-Adapple ($29.95). It plugs into the 16-pin game I/O connector on the motherboard and has two connectors into which you can plug devices such as your joystick and Muppet keyboard. A switch on the Paddle-Adapple lets you select which device you want to use. The Paddle-Adapple comes in three versions. One has connectors for two 9-pin D-shaped connectors, one has connectors for two 16-pin rectangular connectors, and one has one connector of each type.

SCRG also sells 16-pin-to-9-pin and 9-pin-to-16-pin adapters for $14.95. The 16-9 Adapter is useful if you're trying to connect a new-style joystick to a II Plus. The 9-16 Adapter connects old-style 16-pin devices to a IIc.

ALTERNATIVE ENHANCEMENT

Q. *I have an unenhanced Apple IIe. When I bought Timeworks' desktop-publishing program, Publish-It, I discovered I couldn't use it because it required an enhanced IIe. What exactly does the IIe enhancement kit contain, and can I get it from someone other than Apple?*

DONA SAYLOR
PETERSBURG, AK

A. Apple's $70 IIe enhancement kit contains four replacement chips: a 65C02 microprocessor, a character-generator ROM containing MouseText characters for the text screen, and two monitor ROMs that contain new system software. Since the ROM chips contain copyrighted material, you cannot get the enhancement kit from any company but Apple. Pinpoint, however, sells a $29 Apple Upgrade Kit that includes the 65C02 and the character-generator ROM only.

Many programs that insist you have an enhanced IIe take advantage of unique 65C02 instructions, so they can't work at all if you have the original 6502 installed. Some, however, do stick to the 6502 instruction set (so they can run on older IIe models) but use MouseText icons, which show up as inverse characters on the screen if you don't have the new character-generator ROM. Both classes of programs should work well with Pinpoint's upgrade kit. It seems that programs that use the mouse are the ones that require you to have the new monitor ROMs as well, because the new monitor handles interrupts properly.

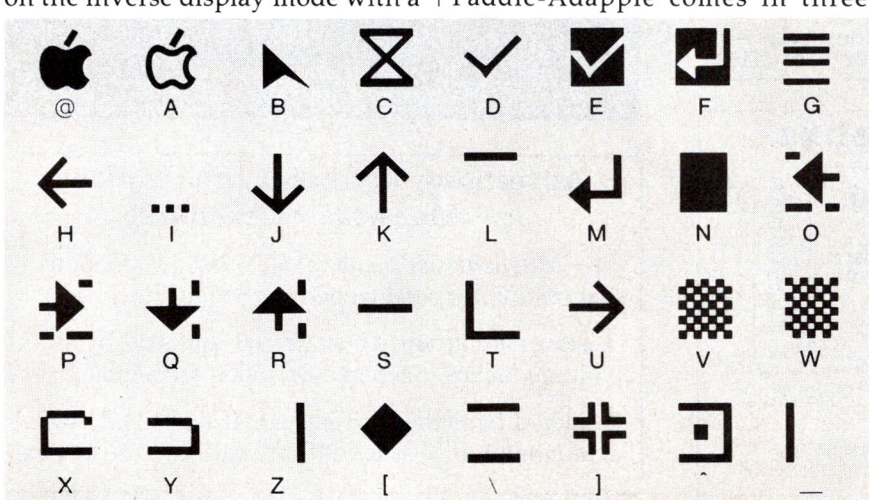

Figure 1: The MouseText character set comprises 32 unique items.

Gary Little is A+'s editor and author of several books about Apple computers. Please send your questions and problems to "Rescue Squad," A+, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

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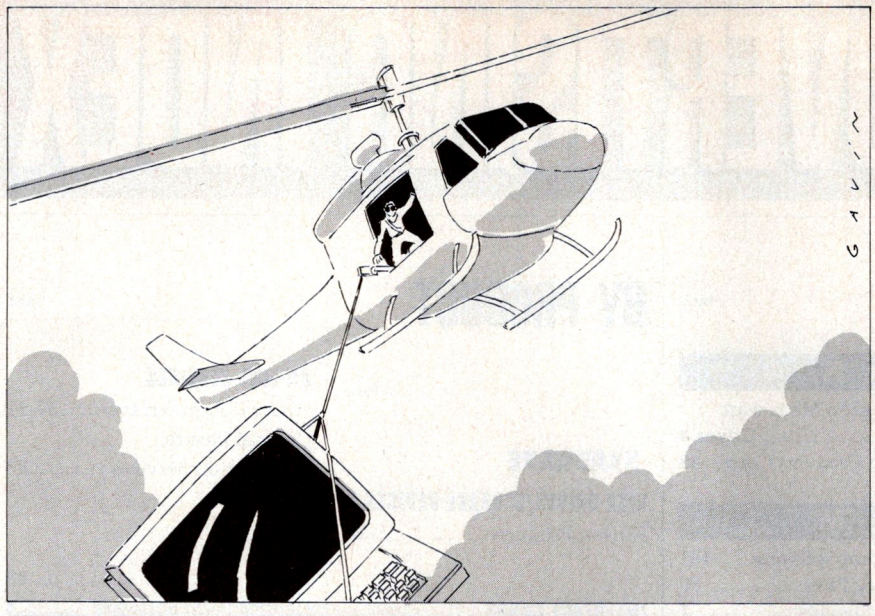

RESCUE SQUAD

BY GARY B. LITTLE

APPLESHARE AWARE

Q. *I'm a software developer who wants to write Apple II programs that are "AppleShare aware." That is, I want my programs to work properly in the AppleTalk networking environment described in the May issue of* A+. *Do you have any programming tips that will help me?*

DAN LAPOMME
CUPERTINO, CA

A. I sure do. The first tip is that your application must run under the ProDOS operating system, not under DOS 3.3, UCSD Pascal, or CP/M—the AppleShare 2.0 file-server software understands the ProDOS, Macintosh, and MS-DOS (IBM PC) operating systems only.

The second tip is that your application is not allowed to use the ProDOS low-level block I/O commands, READ_BLOCK and WRITE_BLOCK, to access a file-server volume. (Many disk-utility programs use these commands when cataloging a disk or recovering deleted files, for example.) If you do use them to try to access the server, ProDOS returns an error code of $88 ("network error").

If you follow these two tips, your application will work properly if you launch it from a disk on a network workstation.

If you want the application to be launchable directly from the file server, you may or may not have a little more programming to do. You have nothing more to do if you insist that the application be stored in a private folder on the server, one where the See Files access-control attribute is enabled for the owner of the folder but not for Group or Everyone. In this case, only one person can use the application at once, so the application doesn't have to worry about problems such as two users' trying to share the same configuration file.

You would be well advised to develop multilaunch AppleShare-aware applications, however. By multilaunch I mean applications, stored in public folders, that work properly even though several users may be using them at the same time. If an application is single-launch only, you have to store one copy per user in private folders on the server.

Many applications you develop may be multilaunch already. The ones you must be careful with are those that create temporary work files or configuration files and those that write configuration information back to the application's disk file. These types of programs are not inherently usable by more than one user at once, because the actions of one user may disrupt the actions of another. For example, if the application stores a configuration file in the application's folder, that configuration will apply to every user, and any user can change the configuration. This situation is not acceptable, especially if the file includes information unique to a particular user.

There are easy ways to avoid these concurrency problems. First, an application should never write back to its disk file. Second, the names of temporary files should be randomized so that no two users will be using the same name. (My favorite technique is to use a file-name suffix that's a random four-digit hexadecimal number.) Configuration files should be stored in the user's own folder on the server; you can determine the name of the user's folder by using the new ProDOS network commands.

You also have to consider other rules if you want your application to allow more than one user to access a data file at the same time. The simplest approach is for the application to open the file but not close it, which prevents any other user from accessing the file until the file is closed. A better approach, however, is to open the file with the SPECIAL_OPEN_FORK command, which allows general access by others, but to use the BYTE_RANGE_LOCK command to prevent access to the specific portion of the file that you are working on.

CENTRAL POINT CONNECTION

Q. *Do Central Point Software's 800K 3.5-inch disk drives work if they are connected to the SmartPort on the Apple IIGS?*

ROBERT BOESE
GLEN COVE, NY

A. Unfortunately, they don't. To use them on a IIGS, you must connect them to Central Point's Universal Disk Controller card and place the card in slot 5. To tell the IIGS you're using the card and not the SmartPort, use the Control Panel Slots command to change `Slot 5` to `Your Card`.

(Continued on page 118)

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CIRCLE 142 ON READER SERVICE CARD

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Please send my free software to the following address. Enclosed are required proofs of purchase (specified below) and $4 (U.S. funds) per free product for shipping and handling. Check or money order should be made payable to Spectrum HoloByte.

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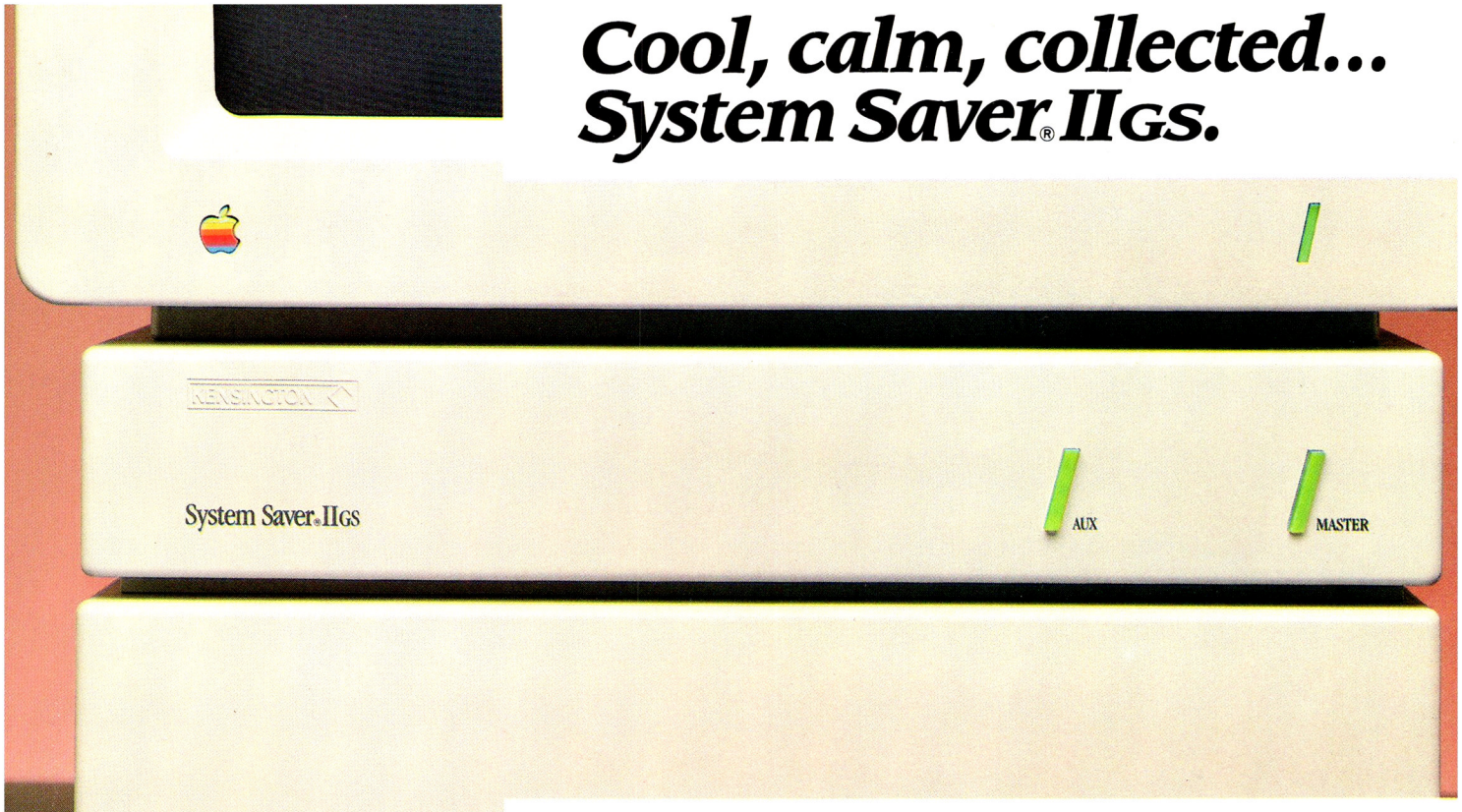
Cool, calm, collected... System Saver® IIGS.



There are two major threats to the life of every Apple IIGS. And one minor annoyance. The threats? Heat and power impurities. The annoyance? Not enough outlets and too many switches. The solution? System Saver IIGS.

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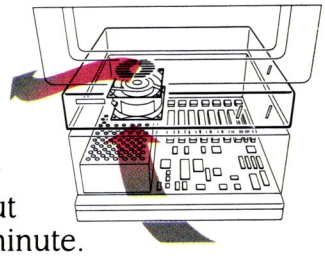

System Saver IIGS keeps your IIGS calm. Its surge suppression circuitry* protects your valuable equipment and data from dangerous power surges and spikes. And its noise filter smooths out disruptive EMI and RFI. It makes your whole IIGS system more reliable and longer lasting.

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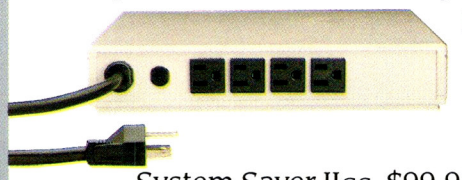

System Saver IIGS, $99.95, is available at Apple dealers everywhere. For more information, or a dealer near you, call (800) 535-4242. In NY, call (212) 475-5200.

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