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VOLUME 3
ISSUE 7

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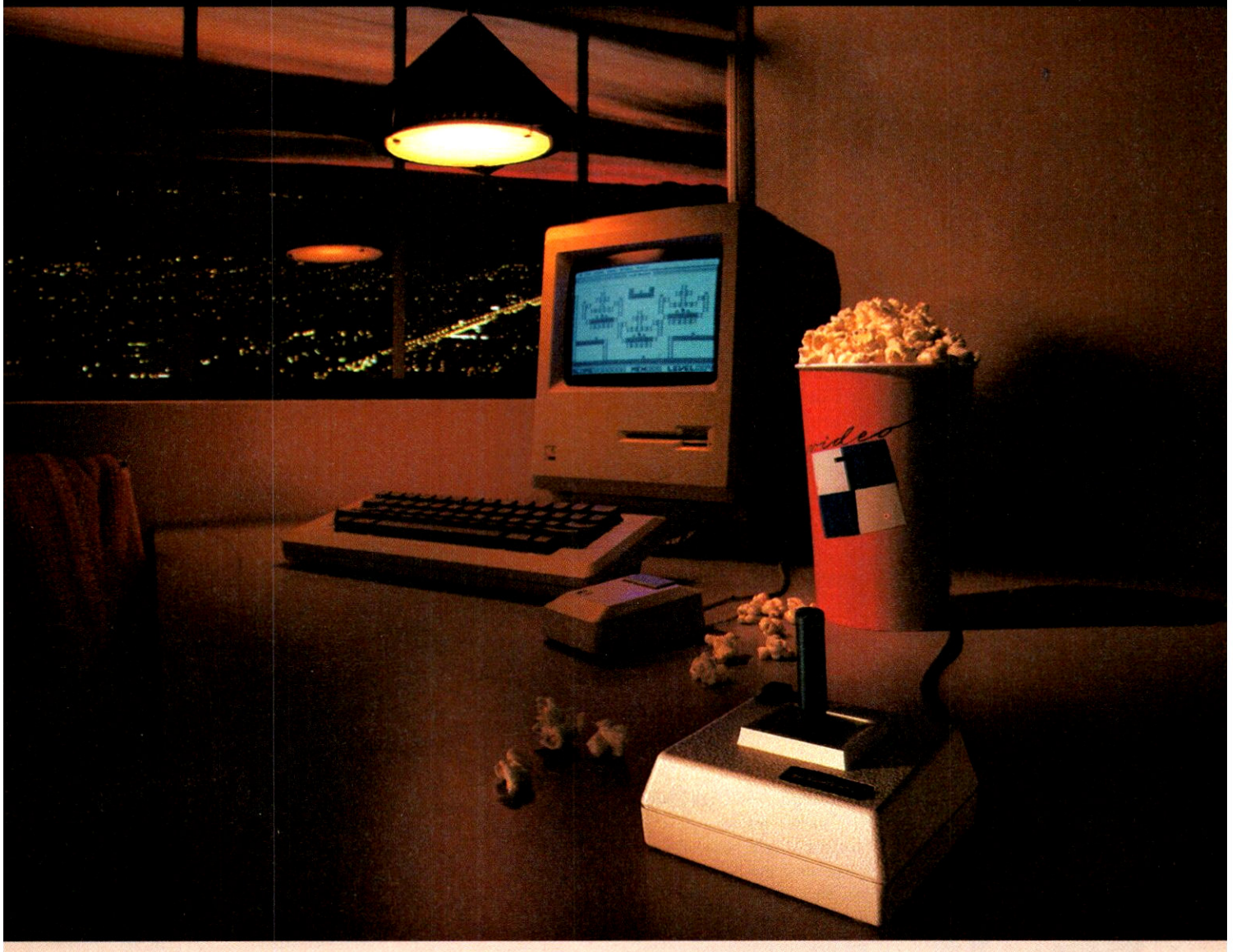
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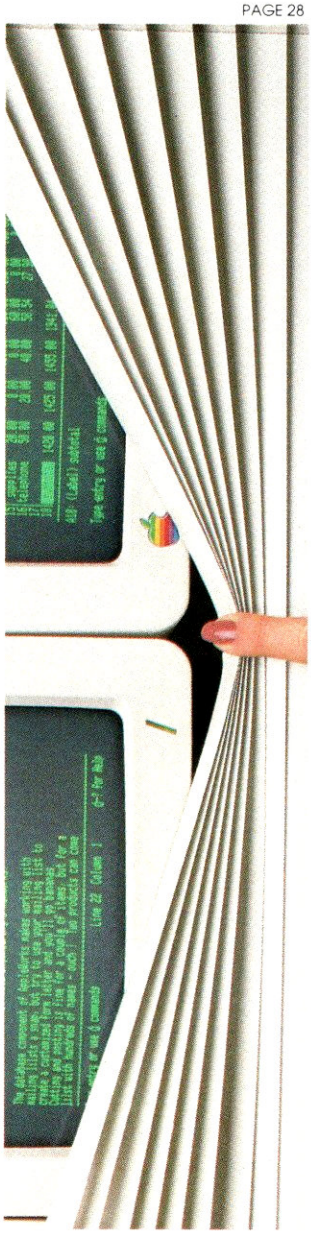
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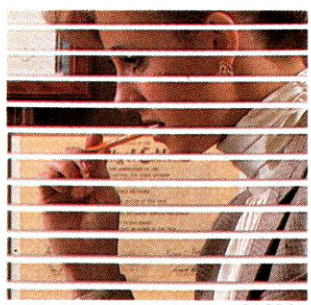


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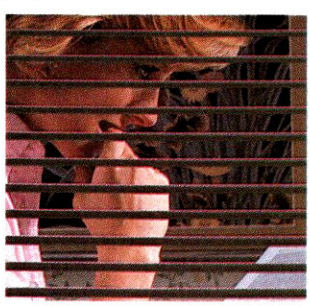
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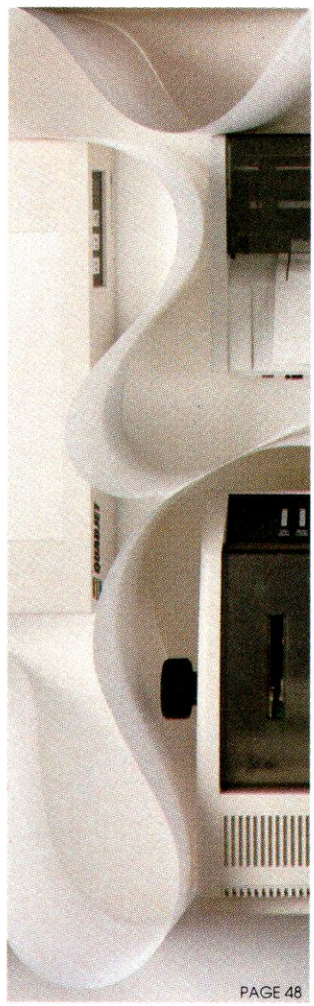
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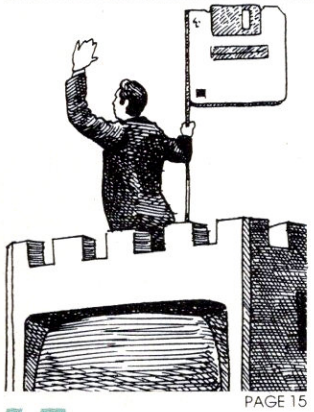
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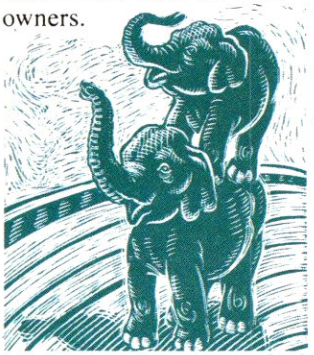
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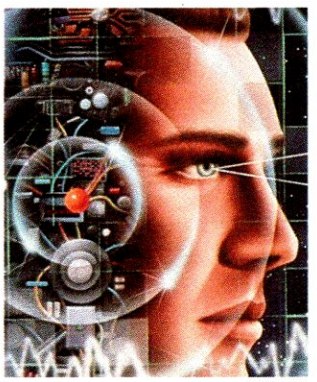
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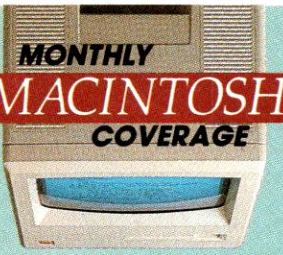
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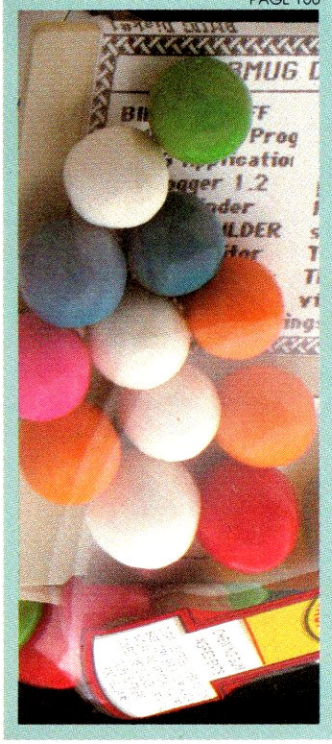
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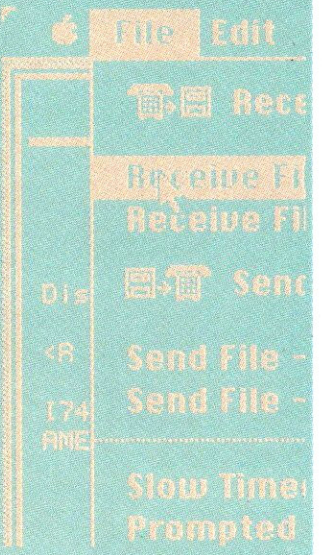


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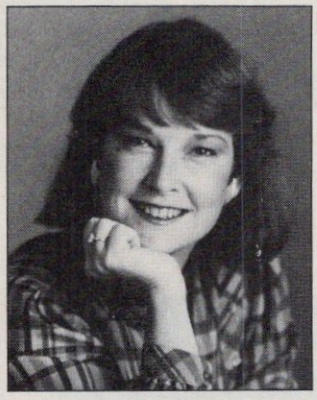
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AppleWorks gains ascendancy in the software-sales charts, giving Apple a boost in the cyclical business world.

APPLEWORKS OVERTAKES LOTUS 1-2-3

Some news crossed my desk the other day that brought a wry grin to my face, since it made me realize how cyclical business fortunes tend to be. The news was that AppleWorks had topped the software sales charts, edging out the leader, Lotus 1-2-3. For those of you who are new to computing, AppleWorks is a software product from Apple that integrates word processing, spreadsheet, and database management on the Apple II family of computers (see our three-part article in this issue, beginning on page 28). 1-2-3 is a program from Lotus Development Corporation that integrates spreadsheet, database-management, and graphics applications.

I've been in this industry for six years, which has given me a historical perspective that was the reason for my grin. You see, a long time ago, when Apple was charting the waters to bring personal computers to the general public, a company called Software Arts introduced a product called VisiCalc, which automated the process known as spreadsheet analysis. VisiCalc was truly an innovative creation and virtually an overnight success that helped propel Apple into the forefront of the fledgling personal-computer industry. Apple and VisiCalc dominated the personal-computer and spreadsheet market for quite some time.

But alas, like most things in life, business cycles come around, and one product must go down while another comes up, which is exactly what happened. In 1981, IBM couldn't resist the siren call of the personal-computer market and invaded with the IBM Personal Computer. With a name like IBM, the product (no matter how mundane) couldn't help but do well. Then a young company called Lotus Development Corporation introduced a product for the IBM PC called 1-2-3. Like VisiCalc, 1-2-3 was a very useful product, and it helped the IBM PC take off, just as VisiCalc had propelled the Apple II. Lotus 1-2-3 climbed to the top of the software charts and stayed there.

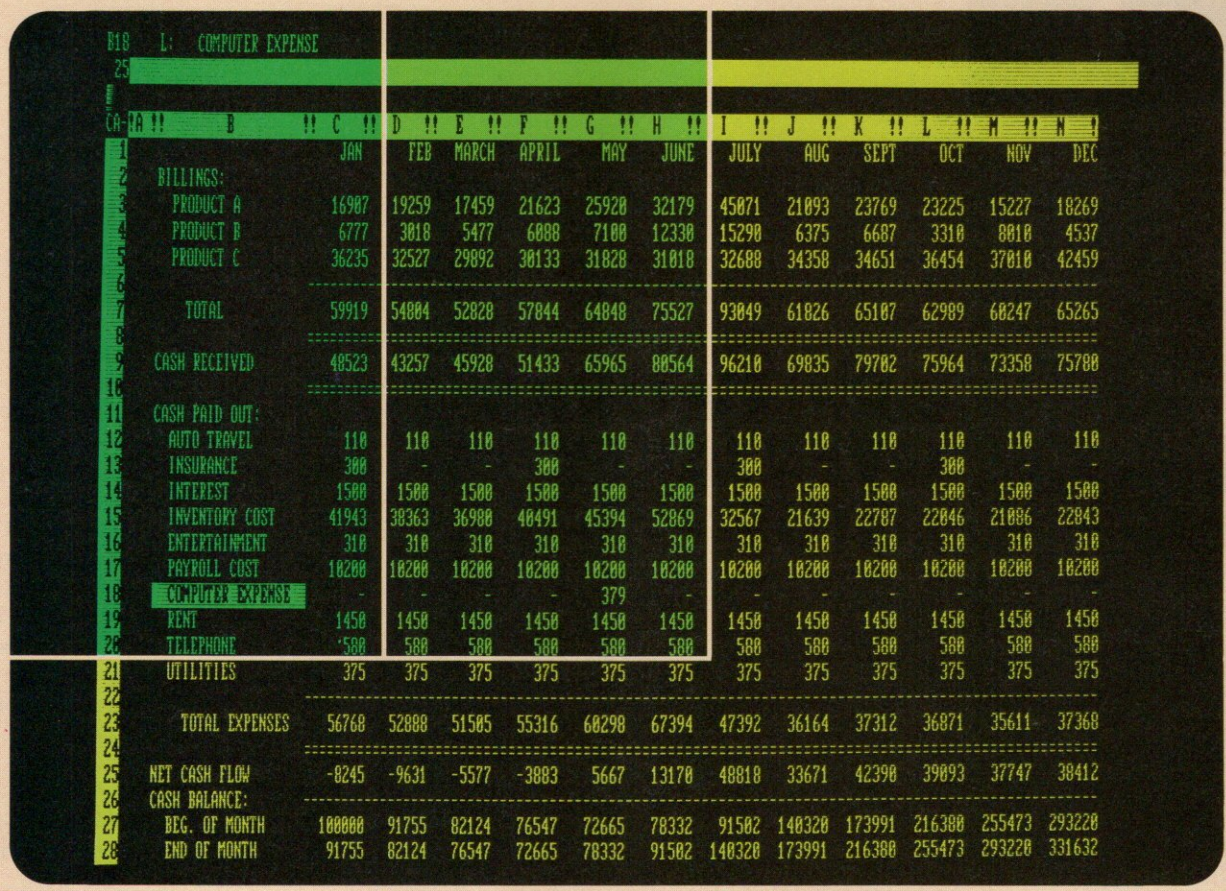
By the time I got the news that AppleWorks had supplanted Lotus 1-2-3 as the top best-seller, I was tired of hearing about how IBM and Lotus 1-2-3 were stepping all over Apple. I was beginning to wonder if we would ever see a shift from the current stage of the spreadsheet wars. Well, AppleWorks has taken Lotus 1-2-3 by surprise and outdistanced the complacent king. An interesting aside is that VisiCalc has declined but has not disappeared—and Lotus recently purchased Software Arts, the company that created VisiCalc.

Besides making life more interesting for journalists, these business cycles have a distinct benefit: better products, which I hope will ultimately lead to truly useful and approachable computers and software. +

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10													
11	CASH PAID OUT:												
12	AUTO TRAVEL	110	110	110	110	110	110	110	110	110	110	110	110
13	INSURANCE	300	-	-	300	-	-	300	-	-	300	-	-
14	INTEREST	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
15	INVENTORY COST	41943	38363	36980	40491	45394	52869	32567	21639	22707	22046	21086	22843
16	ENTERTAINMENT	310	310	310	310	310	310	310	310	310	310	310	310
17	PAYROLL COST	10200	10200	10200	10200	10200	10200	10200	10200	10200	10200	10200	10200
18	COMPUTER EXPENSE	-	-	-	-	379	-	-	-	-	-	-	-
19	RENT	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
20	TELEPHONE	500	500	500	500	500	500	500	500	500	500	500	500
21	UTILITIES	375	375	375	375	375	375	375	375	375	375	375	375
22													
23	TOTAL EXPENSES	56768	52888	51505	55316	60298	67394	47392	36164	37312	36871	35611	37368
24													
25	NET CASH FLOW	-8245	-9631	-5577	-3883	5667	13170	48818	33671	42390	39093	37747	38412
26	CASH BALANCE:												
27	BEG. OF MONTH	100000	91755	82124	76547	72665	78332	91502	140320	173991	216380	255473	293220
28	END OF MONTH	91755	82124	76547	72665	78332	91502	140320	173991	216380	255473	293220	331632

40-Columns → **80-Columns** → **UltraTerm** →

What you see is what you get. It's an old saying, but never more true than with the limited screen displays of most computers. Too often we have to continually jump back and forth to see all the information we are working with. UltraTerm solves this problem.

UltraTerm is the best video card for the Apple IIe and standard Apple computers. Eight different screen formats allow you to tailor the display to your needs. From the 128 column by 32 rows shown above (ideal for spreadsheets), to 80 columns by 48 rows, or even 160 columns by 24 rows, UltraTerm expands your view.

Best of all, the UltraTerm is fully compatible with the Videoterm, the best selling and most widely supported 80-column card for standard Apple computers. UltraTerm is supported by many popular programs. MultiPlan, Word Juggler IIe, WordStar, FlashCalc, and SuperCalc are just a few of the programs that support UltraTerm. Additionally, with optional pre-boots, AppleWorks, VisiCalc, and AppleWriter II can be used as well.

UltraTerm is now available in two forms: one for standard video monitors such as the Apple monitor II, and another with easy-on-the-eyes high quality character set for monitors that support interlace video (with high persistence phosphor).

UltraTerm for standard video monitors
New Low Price—$299.00

High-Quality Character Kit — $49.00
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LETTERS TO THE EDITOR

CATALOG TIP

Dear *A+*,

In your May 1985 issue, page 197, you answered a "Rescue Squad" question regarding printing out a catalog of files. The questioner mentioned that he was using Apple Writer IIe.

Your response was to do a catalog from the system master, which will produce a hard copy of the catalog. This solution is less than ideal, because it requires several boots of the System Master and the application program.

A more direct approach is available from within Apple Writer IIe. This method is to use the Addition Functions menu (Control 0) and its Catalog option (Option A). You are then asked for the slot and drive number. If you end your response with a #, a copy of the catalog loads into memory, and you can then print it out from within Apple Writer IIe.

This feature is noted on page 88 of the Apple Writer IIe manual.

I would like to congratulate you on the quality of your magazine. I find it to be very useful in staying abreast of the fast-changing world of Apple. We use two Apple IIe's in a business environment. I therefore find your articles on new business software, communications equipment and software, and graphic-presentation capabilities to be very informative.

Norman R. Wirtz
Norfolk, MA

DON'T SHORTCHANGE IIc

Dear *A+*,

As a leading Apple magazine, *A+* needs increased IIc coverage, both in providing articles specific to the IIc and providing directed comments within articles covering the II family.

According to *Infoworld*, the IIc took 28% of the Christmas market, compared to the IIe's 11%. In fact, the IIc sold more than the IIe and Mac combined. My Apple dealer is selling three IIc computers for every IIe, and the gap is widening. Software and hardware support of IIc features is sure to increase with the IIc's incredible sales record.

It's clear that consumers have recognized that the IIc is not a "hacker's computer," but "the computer for the rest of us."

I hope your magazine will be in the forefront of covering, promoting, and supporting the IIc.

Robert P. Lyle, Jr.
Baton Rouge, LA

MORE ON ULTRATERM

Dear *A+*,

I own an Apple II Plus and the Videx Ultraterm 80-column card. After having read the excerpt from *The Endless Apple* by Charles Rubin in the March issue of *A+*, I would like to supply interested readers with further information on the Ultraterm, as well as a few corrections:

The Ultraterm can display 40, 80, 96, 128, 132, or 160 columns across the screen and up to 48 lines, in nine fixed combinations.

It has two complete, built-in character sets. One is a standard Apple display, and the other is a "high-quality" set, meant for use in interlace modes.

The Ultraterm supports inverse and normal characters, whose characteristics can be altered through software (via the keyboard) or through hardware (via DIP switches). Each mode can be any combination of the following: standard or high-quality character set, inverse or normal video, and highlight or lowlight (eight combinations for each mode—note that they can both be identical).

I would also like to point out that having a "slow-phosphor" monitor is hardly essential for an adequate display. My Zenith monitor works fine with the Ultraterm, and although there is indeed a slight flickering in the interlace modes, it is hardly noticeable. You actually have to look for it to see it.

I hope this additional information will be helpful to those considering adding an 80-column card to their system. (By the way, I bought my Ultraterm through the mail for less than $200! So don't let the megabucks price tag frighten you off.)

Daniel Harling
Rockport, MA

III COVERAGE

Dear *A+*,

I was very pleased to get my April issue of *A+* and see your "Apple III Software Chart."

A number of magazines are devoted to Apple computers, but I have dropped my subscriptions to several of them because of a lack of coverage of the Apple III. I am happy to continue my *A+* subscription when I see items such as yours written for the Apple III user.

Thomas John Martin
Owings, MD

Thank you. We do our best to cover the entire Apple product line.—Editors

CORRECTIONS

Rama Review

Our April 1985 review of Rendezvous with Rama (pages 180 and 181) incorrectly stated that the game's manufacturer, Trillium Software, was started by Baen Books. The company was, in fact, started by Spinnaker Software.

Graphworks for Appleworks

Our March 1985 "Rescue Squad" incorrectly stated on page 197 that no programs directly interface with AppleWorks for graphics. There is, in fact, such a program, GraphWorks, from PBI Software of Foster City, California, which we look at in this month's "Amplifying AppleWorks" article (see page 30). Our apologies to PBI for the error.

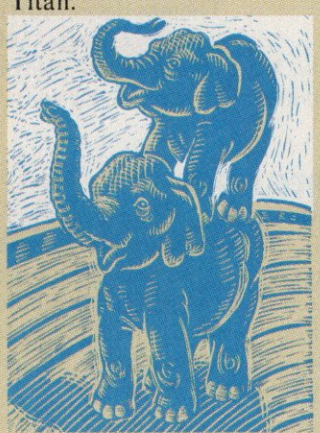
NEWS+

BY FREDERIC E. DAVIS

APPLEWORKS FOR APPLE II AND II PLUS

Previously, the best-selling AppleWorks program could run only on an Apple IIe or IIc. Now the Apple II and II Plus can use AppleWorks, too, thanks to AppleWorks Modify, created by Videx of 80-column-card fame.

The Videx AppleWorks Modify program requires a system with 64K RAM but provides a work space of only 10K RAM, which is not a lot of memory to work with. Hopefully Videx (or some other company) will offer software that allows Apple II and II Plus users to take advantage of memory-expansion cards, such as those offered by Applied Engineering, Legend, and Titan.



CRISTINE MORTENSEN

IIe MEMORY UPGRADE

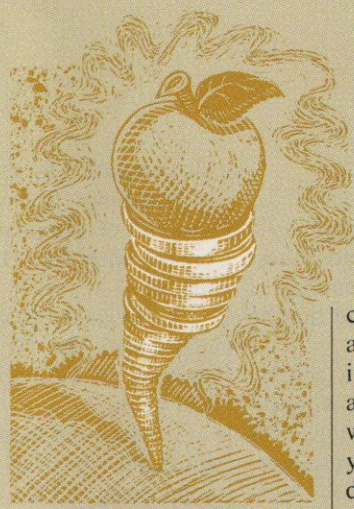
If you have a 64K Apple IIe and have been using AppleWorks, you've probably wished that you had more memory to work with. Or perhaps you want a 128K IIe so you can use double-high-resolution graphics.

Whatever your reason, if you want to upgrade your IIe to 128K, you can save some money by adding the extra memory to the 80-column card in your present IIe. You don't have to scrap the 80-column card in favor of the Extended 80-Column Card. Two companies I know of, Apricorn and Caribbean Computer Sales, offer a piggyback board with an additional 64K RAM that plugs into your existing IIe 80-column card. These cards provide an economical way to expand your IIe's memory from 64K to 128K.

APPLE DONATES $2 MILLION

Apple Computer, Inc., recently donated more than $2 million worth of used Apple II Plus computer systems to the National Easter Seal Society, the world's largest volunteer organization, which provides rehabilitation services to people with disabilities. The computers are to be used to help people with learning disorders, communication impairments, mobility limitations, vision problems, and other disabilities.

John Garrison, executive director of the National Easter Seal Society, doesn't mind one bit that the computers are used. According to Garrison, the gift ". . . is an outstanding example of how industry and the nonprofit sector can join in programs that put to great service used, but useful, products."



APPLE SALES BOOMING

Despite the roller-coaster ride that Apple stock has been taking, Apple products are selling in record quantities. During the first half of Apple's 1985 fiscal year, sales were more than $1 billion dollars, compared to about $600 million for the same period last year. In terms of units sold, Apple had about a 35% market share of all microcomputers sold during that period.

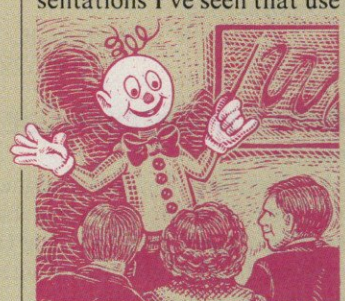
Apple president and CEO John Sculley explained the strong sales by saying, "Our business in the education market during the second quarter exceeded our expectations . . . Apple's revenues increased substantially over the same period a year ago, and at a rate most other industries would consider a major achievement."

WHEELS FOR THE MIND

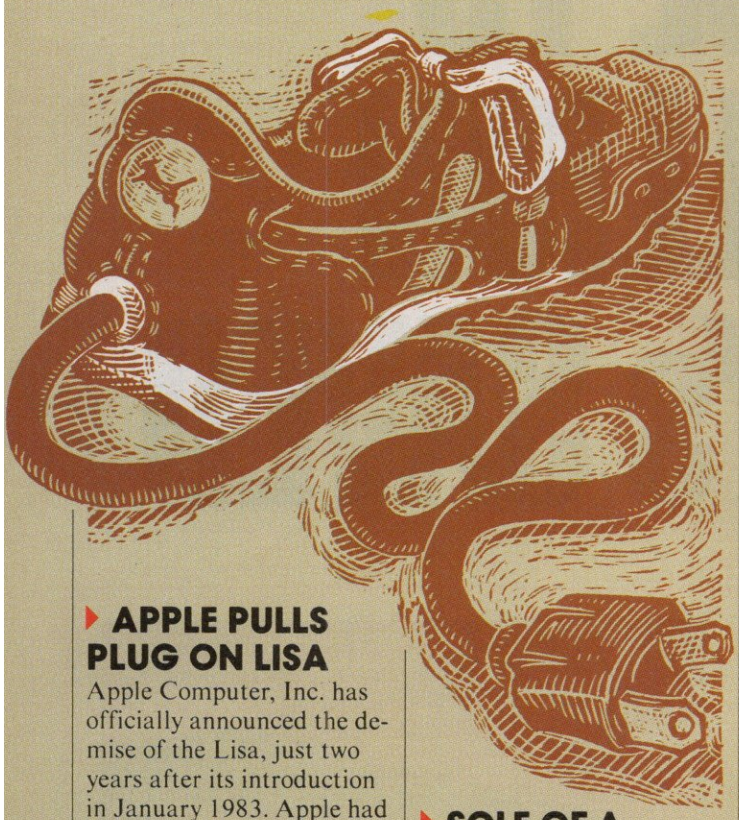
The member institutions of the Apple University Consortium have already acquired more than 50,000 Macintosh computers, and some fascinating projects are now underway. For those of you who are interested in what's happening with the consortium, Boston College is publishing a newsletter called *Wheels for the Mind* as a forum for exchanging information and ideas about collegiate computing with the Macintosh. If you're interested in more details, contact Wheels for the Mind, Boston College, Fulton 430, Chestnut Hill, MA 02167.

ANIMATION SENSATION

Wow! That's what I said when I first had a chance to play with VideoWorks, the new animation program for the Macintosh that was developed by Marc Canter and the other folks who brought you MusicWorks. VideoWorks is a remarkable program that produces stunning animated graphics for both fun and business. Animation for business? you ask. Believe me, some of the animated business presentations I've seen that use



VideoWorks are extraordinary. Look for a feature article on this milestone program in next month's issue of *A+*.



APPLE PULLS PLUG ON LISA

Apple Computer, Inc. has officially announced the demise of the Lisa, just two years after its introduction in January 1983. Apple had grand plans for the Lisa and spent more than $50 million developing the product. Apple originally thought that the Lisa would be the machine that established Apple as a supplier of computers to large corporations, but now the company has pinned its hopes for corporate sales on the Macintosh.

The Lisa never did as well as Apple expected, and the company made a last-ditch attempt at bolstering sales by renaming the computer the Macintosh XL (see "News+," April 1985). Now Apple has decided to consolidate its product line to include just the Apple II and the Macintosh. In a related announcement, Apple said it would introduce a 20-megabyte hard disk for the Macintosh that fits under the computer in order to conserve desk space. The hard disk will allow the Mac to take over the Mac XL's role.

SOLE OF A NEW MACHINE

I've heard of the old soft shoe, but shoe software? The Puma RS Computer Shoe and Software Package press release is one of the wildest to cross my desk in some time.

The shoe contains microelectronics that measure how far you run in a session, or series of sessions. When you get back from your run, you simply plug your shoe into your IIe; the accompanying diskette contains software that tells you how far you've run and how many calories you've expended.

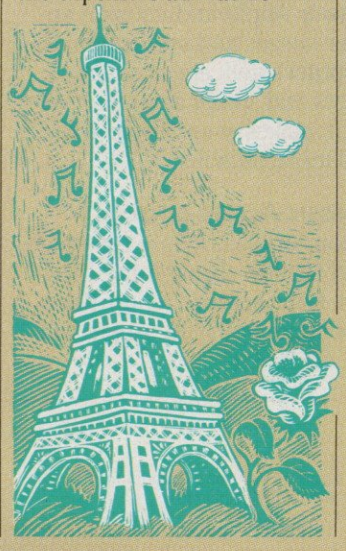
The shoe has a built-in stopwatch and sensing devices that detect the number of times your foot hits the ground. The shoe is programmable; you can specify a certain distance, and the shoe emits a beep when you've run that far. Who'd have thought we'd ever have footwear software?

PARLEZ-VOUS PC?

In May I told you that Nolan Bushnell was putting chips in computerized pets. Now Puma has put chips in its computerized shoe. To top it off, IBM has put chips into a computerized magazine advertisement that appeared in 270,000 copies of *Le Point*, France's leading newsweekly.

The IBM ad was a four-page advertising insert that contained a microprocessor, a speaker, two batteries, and lights that were all sandwiched inside a page. The first page of the insert told readers, "Open your eyes, you won't believe your ears." When they turned the page, they saw IBM's little tramp next to an electronically lit IBM PC, while th tiny speaker played prerecorded music. The two batteries allowed the ad to run for about 75 hours.

Dominique Sebileau, the advertising manager for the IBM PC in France, said that the expensive ad was designed to change IBM's image from that of a big, unwieldy corporate monster. This image may be part of the reason that Apple is outselling IBM more than 2 to 1 in the French market.



APPLE III FOREVER?

The Association of Independent Microdealers (AIM) has announced a new promotion called Apple III Is for Me. AIM plans to act as a central clearinghouse for Apple III owners and microcomputer dealers. AIM hopes that the Apple III Is for Me program will help Apple III users locate products for their computers and that it will help dealers and manufacturers locate potential customers. For further information, contact Ronald A. Wallace, President, Association of Independent Microdealers, 3010 N. Sterling Avenue, Peoria, IL 61604; (309) 685-4843.

ENHANCED APPLEWORKS

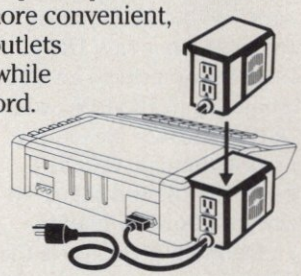
Rumor has it that Rupert Lissner is hard at work creating a new version of AppleWorks for the Apple II that incorporates features such as the mouse, icons, pull-down menus, and dialog boxes. The new version supposedly will not be ready until the end of this year. These new features will almost certainly make use of MouseText, which means you will need a IIc or an enhanced IIe to use the program. +

CLOSE TO ¼ MILLION APPLE II's SAVED

SYSTEM SAVER® from Kensington Microware quietly protects close to ¼ million Apple® II's every day. Often referred to as "the piece Apple forgot," System Saver's unique combination of features have made it the most versatile, most convenient, best selling accessory ever made for the Apple.

System Saver organizes your power needs.

To make your Apple system more convenient, System Saver provides extra outlets for your monitor and printer, while replacing the Apple's power cord. One front-mounted power switch controls your whole system.



System Saver solves power line problems.

Impurities in the power supply cause 70-90% of all microcomputer malfunctions. Line noise can be interpreted as data, confusing your Apple and causing annoying system errors. Power surges and spikes can do costly damage to your computer's delicate circuitry.

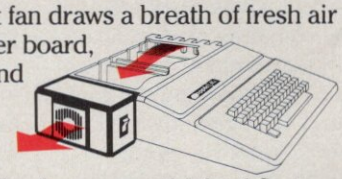
System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

System Saver keeps your Apple cool.

Peripheral cards added to your Apple not only generate heat, they block any natural air flow through the computer. The resulting high temperature conditions can potentially shorten the lives of both your Apple and your peripheral cards.



System Saver's quiet fan draws a breath of fresh air across the Apple's mother board, over the power supply and out the side ventilation slots at the rate of 17 cubic feet per minute.



Close to ¼ million Apple owners think of System Saver as the piece Apple forgot. And ¼ million well-protected Apples agree. Available at your local dealer. For more information, contact Kensington Microware, 251 Park Avenue South, NY, NY 10010, (212) 475-5200 Telex: 467383 KML NY.

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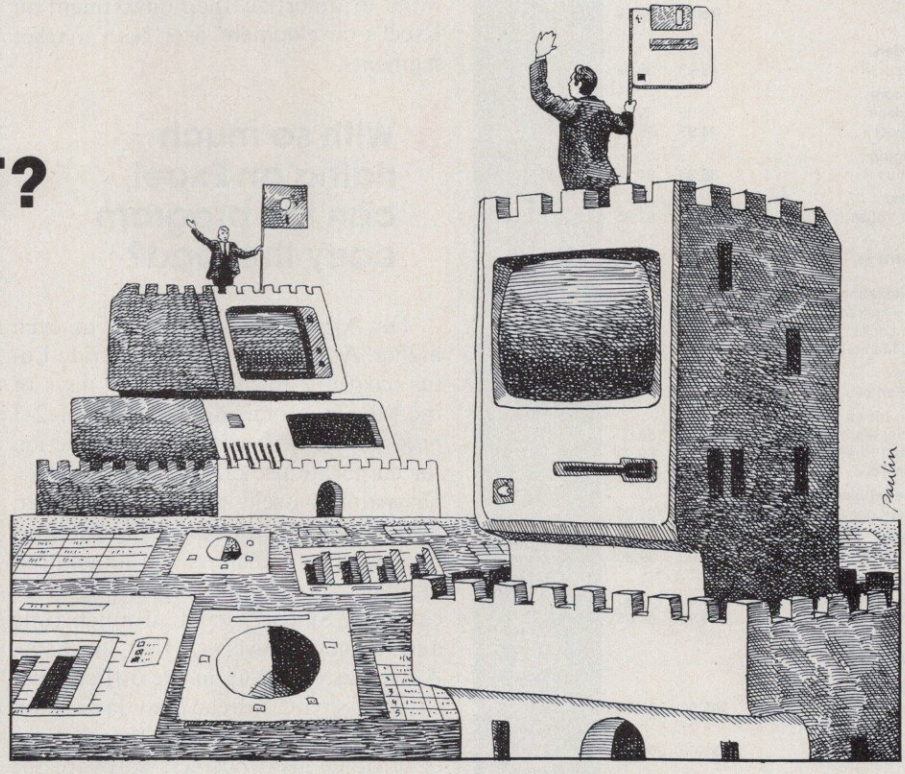
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THOUGHTWARE
BY STEVE ROSENTHAL

With Microsoft's latest entry for the Macintosh, the business-software competition is heating up.

WILL EXCEL DO JUST THAT?



Financial and numerical processing are what managers want most out of computers, at least the surveys say so. That's why VisiCalc was the corporate hit on the Apple II and Lotus 1-2-3 on the IBM Personal Computer. And that's why Microsoft is betting that its new entry, Excel, will be a business best-seller on the Macintosh.

Microsoft let *A+* take a look at a prerelease version of Excel, with the warning that some small aspects of design may be changed and performance will definitely be tweaked up by June's scheduled release. This isn't vaporware, though—I've actually had the program running, with all the promised functions operational except some types of data transfers and the help messages.

Excel is a spreadsheet with integrated graphics and a simple database, an almost direct Macintosh analogy of Lotus 1-2-3. Compared to Lotus Jazz for the Macintosh, Excel is simpler, more oriented toward numbers, and several hundred dollars less expensive. More simply, Excel is more like 1-2-3, and Jazz is more like Symphony.

In another sense, Excel is an upgrade to Microsoft's highly regarded Multiplan spreadsheet, combined with the Microsoft Chart graphing program. If you know how to use those programs, in fact, you're most of the way to a working familiarity with Excel. With The Switcher, you can run Multiplan and Chart in tandem, but Excel takes care of shipping the data around automatically and lets you open multiple windows for charts and spreadsheets and move between them.

Some Specifics

Here are some of the specifics. Excel offers a huge spreadsheet of 256 rows by 16,384 columns, 42 types of business charts, and a row-and-column type of database. Cells in one spreadsheet can refer to parameters or calculated values in another, so you can easily consolidate detailed views into a more global perspective. For automating repetitive tasks, a built-in "macro" function can remember your procedures.

The program follows almost all the expected rules of the Macintosh user interface, letting you use the mouse to pick most operations from pull-down menus or by clicking on selections. You can cut, paste, scroll, and select with the mouse and pick your typeface, typestyle, and size. Excel has excellent data import/export capabilities. You can ship data back and forth between Excel and Microsoft's Multiplan or Chart on either the Mac or the IBM PC, or even Lotus 1-2-3 on the PC.

Microsoft is betting that its new entry, Excel, will be a business best-seller on the Macintosh.

It's Strategic

Putting aside for a moment the question of whether the program works well, it's obviously an important product for competitive reasons. From Microsoft's view, it's the opening shot in a battle to reclaim a bigger share of the corporate software dollar from upstart firms such as Lotus. Corporate users don't buy a lot of compilers, and they don't spend a lot of money on Flight Simulator (which, even if they buy it, is priced as a game). They're not even buying word-processing programs at rates close to those for spreadsheets.

Excel is targeted right at the most well-trodden path to corporate sales, a path hewn perhaps by VisiCalc but paved, in large part, by Lotus 1-2-3 for the IBM PC. While Lotus is still struggling to win the acceptance for Symphony that it had for 1-2-3 in the IBM arena, Microsoft obviously figures that similar market forces will favor Excel

DOUG PAULIN

THE BEST FOR LESS

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Assimilation Process		
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Mac Lockit	29.95	23.95
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Axlon		
Art Portfolio	59.95	47.95
Dow Jones		
Market Manager Plus	199.95	160.00
Spread Sheet Link	99.95	80.00
Strait Talk	79.95	64.00
Expertelligence		
Exper Logo	150.00	130.00
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Koala		
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Thunderware		
Thunderscan	250.00	200.00

Apple

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CBS		
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Fontrix	95.00	76.00
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over Jazz for the Macintosh.

Excel's importance for Microsoft may go beyond the Mac. Although Excel makes heavy use of the Macintosh user interface and the Macintosh QuickDraw routines, Microsoft currently sells both major components of the package—Multiplan and Chart—for the IBM PC and other MS-DOS machines. It is hard to believe that the ace marketers from Bellevue won't want to amortize their investment in Excel's development over both market segments.

With so much riding on Excel, can the program carry the load?

For Apple, the stakes may be even higher. Apple, having hoped to ride Lotus' coattails during the early days of the Mac by promising the "Lotus 1-2-3 product" (Jazz) as *the* key attraction for corporate use of this new machine, has painted itself into quite a corner, first as the announcement date slipped backward and then as the announced product joined the "recedingware" category. Since it spent so much time and money delivering that message, Apple has ended up in the difficult position of saying instead that Jazz is not all that necessary and that there's plenty of other good business software for the Mac.

Having an alternative to Jazz will reassure corporate buyers, partially vindicate Apple, and give the Macintosh community something positive to displace speculation about any problems Jazz may be encountering.

Excel may also prove to be an extremely strategic product for Apple's new "peaceful coexistence with IBM" approach to the corporate office. One of the points Microsoft's competitive summaries for Excel emphasizes is that this product not only reads but also writes data in the form Lotus 1-2-3 uses (Jazz, at last announcement, only reads 1-2-3 data). If they have access to a network linking IBM PCs and Macs, Excel users will be able to exchange data freely with 1-2-3 users in both directions. As any student of politics will tell you, one-way trade makes for tension and dispute, and two-way balanced trade promotes peace and harmony.

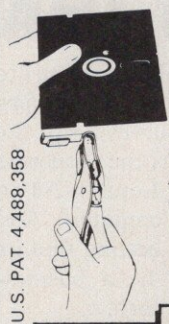
Can It Carry the Load?

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can the program carry the load? Is it what corporate users will want and buy?

As a spreadsheet, Excel should get the same high marks Multiplan has garnered. You have to be a certain kind of person to be a spreadsheet fan, and if you're that type, you'll probably like Excel. Even if you're a more casual user, you'll probably find that if you need one of the more powerful spreadsheet programs, this one has a good power-to-complexity ratio.

As with any spreadsheet software, Excel provides you with a row-and-column display, with each box made by the intersecting lines considered a cell. You can put data, formulas, or text in any cell, including formulas that depend in part on the value of other cells. That ability allows you to prepare budgets, projections, taxes, income statements, expense analyses, and so on.

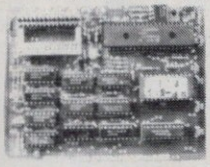
The Excel spreadsheet is memory-resident, so setting up your columns, formatting entries, and entering data are all quick and easy. You can make cell entries directly by clicking on a cell to make it the active cell and then entering text in the formula bar at the top of the screen. In addition, you can take advantage of the mouse to select other cells, predefined functions, names you have given to regions, or any other information Excel has stored up. You can even read cells from spreadsheets created by your coworkers on a network.

The Default mode is to treat all cell references as relative to the active cell, but you can also select the Absolute mode when you want it. You can give cells, regions, or even collections of disparate regions a name, by which you can refer to them in formulas or in charts. To refer to a cell in another spreadsheet, you cite the spreadsheet name, combined with the cell, range name, or position. If the necessary spreadsheet isn't on the current data disk, Excel prompts you to change disks until it finds the requested data.

Excel also lets you open up multiple windows, with a spreadsheet in each one (and you can keep a spreadsheet open and on the desktop but hidden away behind other windows). This option allows you to work with multiple spreadsheets, look at distant parts of the same spreadsheet, or see the effects on one region of the spreadsheet as you change values in another. When you recalculate, any change that affects an open spreadsheet causes recalculation of dependent values, even if the values are in a hidden window.

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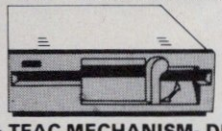
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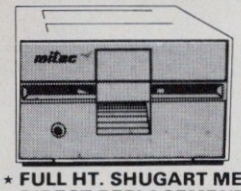
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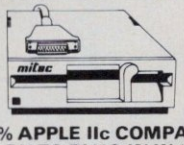
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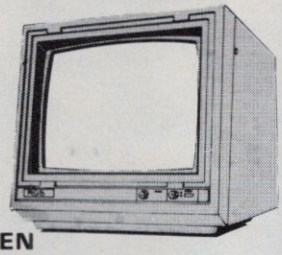


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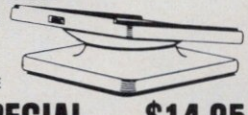
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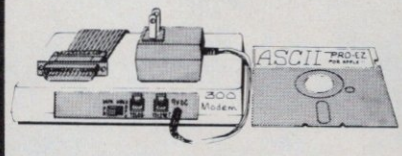
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CIRCLE 328 ON READER SERVICE CARD

Because I was looking only at a prerelease version, I couldn't determine how quickly the spreadsheet in the final version would do calculations. Excel uses a selective recalculation technique that keeps track of which cells are affected when you make any change or addition, however. During recalculation, only affected cells are recomputed, a procedure that speeds processing considerably.

Spares Not Memory

Unfortunately, Excel doesn't seem to manage memory use with the finesse with which it handles calculations. As has been common until recently in spreadsheets, Excel allocates memory to account for the largest rectangle of cells that includes row 1 column 1 and the entry you make the furthest down and to the right. Thus, if you enter values in just one cell in row 100, column 100, Excel saves space for 10,000 cells.

So, although the potential spreadsheet size of 256 × 16,384 cells sounds impressive, you can't really use that much of it. The biggest square you can get on a 512K Mac, in fact, ends at about row 245, column 245. Excel claims disk storage with a similar voracity.

The two-sided coin of ease of use and high speed, on the one hand, and limited capacity, on the other, marks Excel's database function as well as its spreadsheet. The database is similar to the capabilities of Multiplan, not the more extensive record-keeping facilities of Microsoft's File. You can declare any rectangular area of the spreadsheet a database, with each row treated as a record and each column as a field. Data in the fields can be the same numeric, logical, or textual values that are permissible in ordinary Excel spreadsheet cells. You can sort or select database regions (up to three fields used as the key per sort) on any combination of fields. Excel has a complement of functions that work on databases, and you can employ their results or database values in spreadsheet formulas.

In practice, you ought to think of Excel as having a sorting and selection capability for spreadsheet regions, rather than a true database component. It's quick and easy, but it doesn't have any kind of reporting or text-formatting ability. My guess is that the database function will be the least-used of Excel's major features.

In contrast, the graphing section of Excel looks to be a hit. The most difficult part of drawing a chart is figuring out how to get it started (you select the

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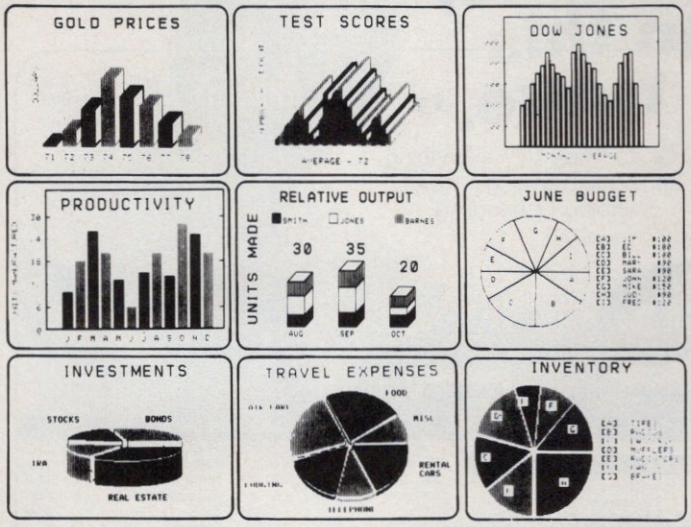
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"I noticed the advertisements for Spectral Graphics' Master Chart! program and figured that, with a money-back guarantee, I would try it. Boy, am I glad I did! This is a fantastic program. You can master its many varied capabilities in less time that it would take to describe them. I would recommend it to everyone, even if you have absolutely no need for a graphing program. It's just fun to play with." **S.A. Smith, San Bernadino, Calif... letter to SOFTALK, June, 1984, page 14.**

"The software does much more than the advertisement suggests. Without question, this is among the best buys in software that I have ever come across, and certainly among the best written. It is extraordinarily easy to use, very well thought out, and priced to kill your competition (which I wish you every success in doing)." **Anthony J. Scriffignano, North Caldwell, New Jersey.**

"I have long been distressed by the lack of software available in the scientificlacademic community. At last there is a simple yet robust graphics program applicable for our purposes: MasterChart!, by Spectral Graphics Software. Business folks and scientists alike will really appreciate how user-friendly it is; I was able to produce my first three-dimensional, multi-colored, labeled bar graph within five minutes of booting the disk--without reading my documentation. I would have had to pay a scientific illustrator much more than the whole program costs just to produce that one graph....you can't do without this gem." **John B. Iverson, Richmond, Indiana...letter to SOFTALK, April, 1984, page 23.**

ONLY $29.95 Apple II+/IIe/IIc. Satisfaction guarantee or your money back (really!). Send a check or purchase order to **SPECTRAL GRAPHICS SOFTWARE,** 6333 Pacific Avenue, Suite 256, Stockton, California 95207. Or call (209) 463-7309 for COD orders and dealer inquires. MasterChart! is not yet sold in most stores. All orders are shipped immediately and are in your hands within three days.

CIRCLE 109 ON READER SERVICE CARD

range you want graphed, pull down the File menu, select New, click on Chart, and see the result). Once you get a chart on the screen, you can change its type, add or take out legends, add text, or superimpose arrows. You have a choice of seven main types of charts, with six standard variations each, so you should find the type you're looking for. If you've kept your spreadsheet window open, you can make changes in your data and immediately see the result in the graph region.

As slick and easy as the graphics are in Excel, I would have liked to see support for color plotters. Even if Apple wants to convince us that color is unnecessary on the Mac, just see whether the audience at your next meeting or talk

Excel has a powerful spreadsheet, a well-integrated and easy charting package, and a limited database. If you work only with numbers and need more than Multiplan, give it a workout.

finds monochrome illustrations very inviting. Perhaps pressure from a firm such as Microsoft could move Apple away from its ideological fixation on this issue.

So there you have it. Excel has a powerful spreadsheet, a well-integrated and easy charting package, and a limited database. If you work only with numbers and need more than Multiplan, you ought to give it a workout—especially if you're a decision maker who wants a quick way to examine, modify, and test figures you get from subordinates and coworkers. Excel's ability to read Lotus 1-2-3 files (which you may have to transfer by phone line until intermachine local-area networks arrive) gives you access to data on IBM PCs but keeps the easy-to-use Macintosh visual interface.

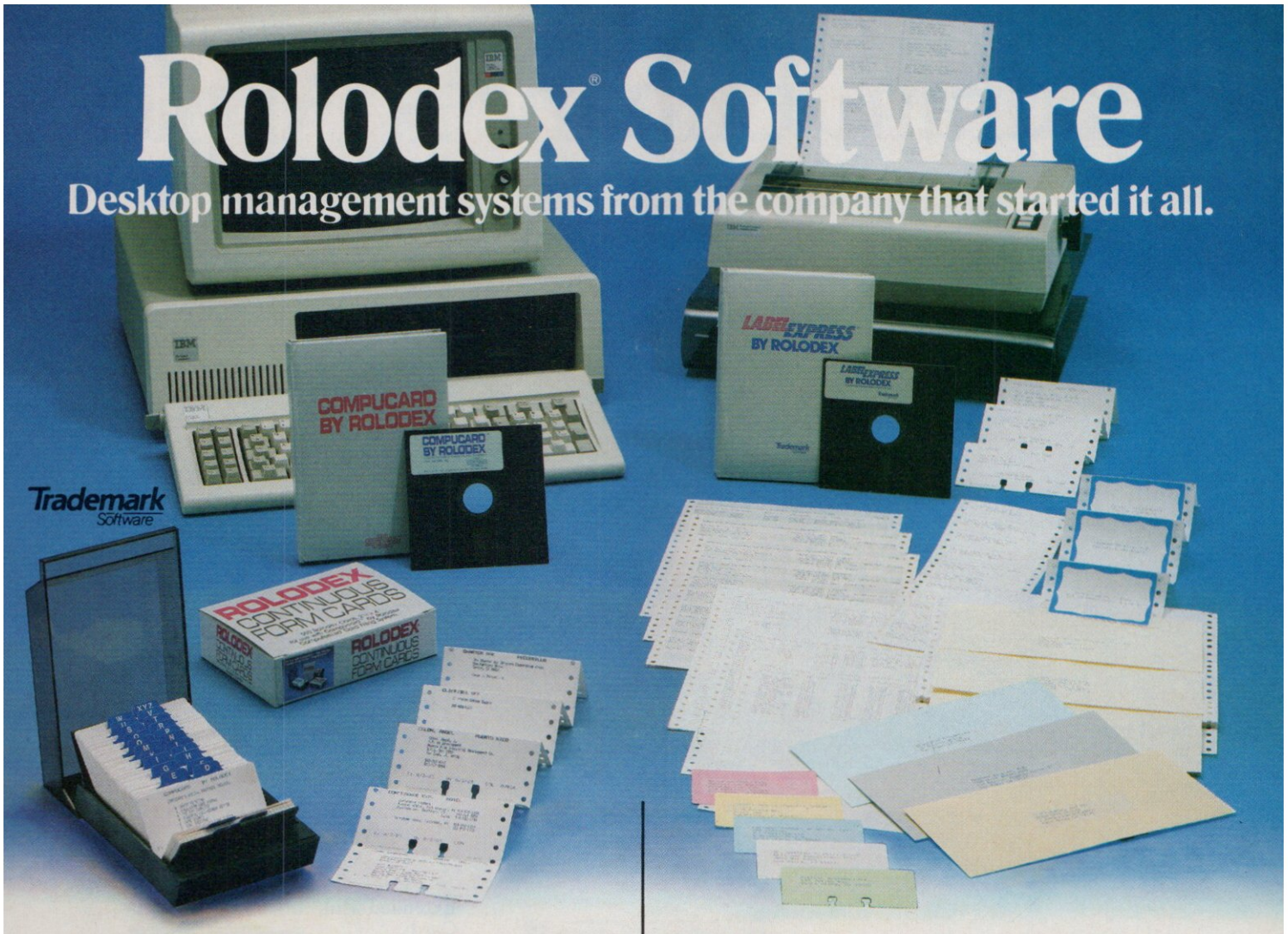
On the other hand, if the prerelease version is a good indication, you may need a hard-disk Macintosh for optimum use of the program. When I tested it, Excel required more than 300K of storage on two disks, which it spent a good deal of time accessing. User-provided data is supposed to be kept in memory, so it looks like the program, even on a 512K Mac without memory partitioned off by The Switcher, uses many overlays—bad news for the less patient among us floppy-disk users. Perhaps it's another reminder that serious business applications for any computer increasingly demand a fast hard disk. If you don't already have such a beast, check out Excel's waiting time to see if you find it acceptable; if not, be sure to add in the cost of a hard disk when you figure out the cost vs. the benefits.

Last, one of the major premises and promises of the Mac is that "knowledge workers" no longer need turn their word work over to secretaries. For writing support, Microsoft recommends you combine Excel and Microsoft Word, using The Switcher. Unfortunately, calculating whether this combination approach or a completely integrated package is better for you is beyond the present ability of Excel or any other spreadsheet. +

Steve Rosenthal started off writing accounting programs for a large financial house. By most accounts, he now spends a good deal of time writing for A+ from his largely financed house.

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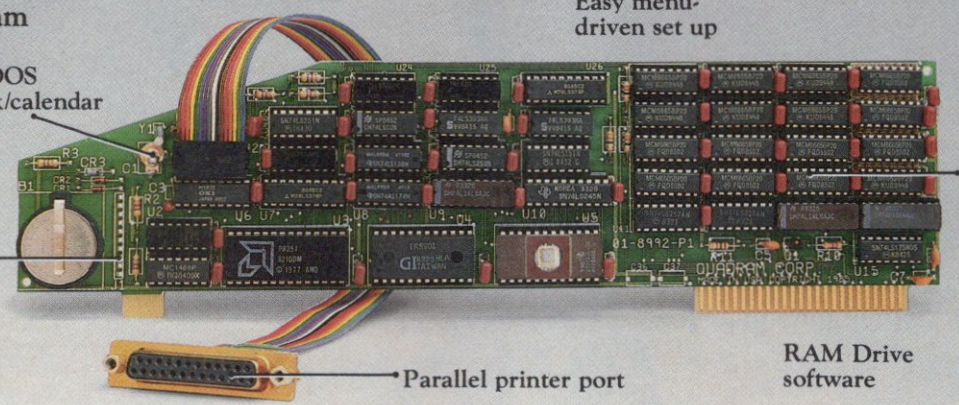
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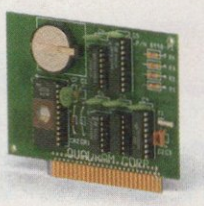
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Quadram expands the power of the Apple II series personal computers. Quadram set the standard with the Quadboard. Now we offer you Multicore, the card that delivers RAM expansion to 256K, parallel and serial ports, a ProDOS clock/calendar, and RAM drive software. Plus, there's the new Extended Multifunction Card, Clock/Calendar Card, Serial Interface Adapter, and Buffered Serial Interface Adapter. All designed to bring out the best your Apple has to offer. For further details on these cards as well as our popular APIC parallel interface and eRAM 80 cards visit the dealer nearest you, or contact us at 4355 International Blvd., Norcross, Georgia 30093 (404) 923-6666.

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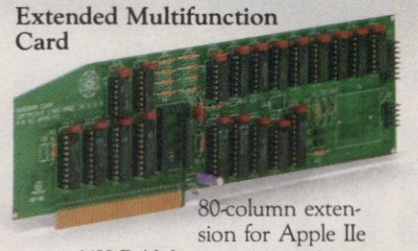


Pro-DOS Clock/calendar
Long-life Lithium battery • Easy to use date/time software.



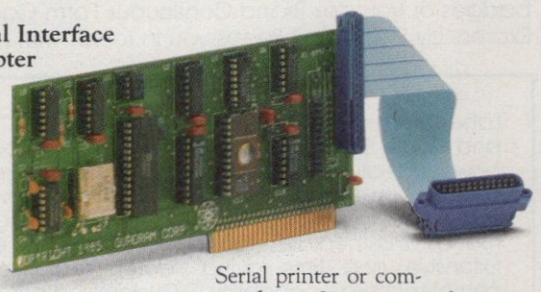


Extended Multifunction Card



80-column extension for Apple IIe • 64K RAM expansion option • Color RGB interface • ProDOS clock/calendar.

Serial Interface Adapter



Serial printer or communications interface • Supports graphics for Apple Imagewriter and Scribe printers • Apple Super Serial Card compatibility • Easy "switchless" serial configuration.

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CIRCLE 139 ON READER SERVICE CARD

INK-JET TALK

▶ APPLEWORDS BY STEVE ROSENTHAL

A short glossary of terms for use with 'Meet the Ink Jets,' page 48

A SIZE
The standard American 8½ × 11-inch size for office paper. Most Apple software that doesn't offer a choice of paper formats assumes you will use this size paper. All common ink-jet printers can use A-size paper.

A4
The designation for standard-size office paper in international metric sizes. An A4 sheet is 210 × 297mm, or a little taller and narrower than the 8½ × 11-inch sheet used in this country.

ABSORBER PAD
A replaceable paperlike element that soaks up ink an ink-jet printhead sprays out as it goes through its automatic cleaning cycle.

CHARACTER MATRIX
The set of dots that form each character. Ink-jet printers for Apple computers often use a matrix as dense as 11 × 12 dots, enough to make the characters look less computerlike.

CLAY PAPER
A type of paper for use with many color ink-jet printers. Clay paper is less absorbent than normal papers, and it causes less spreading, or wicking, of the ink. The ink used with it must be of the surface-drying type.

CONTINUOUS STREAM
An ink-jet technology that continually emits drops but diverts them from the paper when the drops are not needed to create the image. Large high-speed models for minicomputers and mainframes use this technology, but printers normally used with Apple computers do not.

dB OR DECIBEL
The measure of the noise a printer or other device emits. Ink-jet printers usually measure under 55 dB, which is about the level of conversation. An impact dot-matrix printer such as the Imagewriter reads as high as 85 dB.

DOT-ADDRESSABLE
A mode or type of graphics that allows an Apple computer to specify to the printer exactly which dots to print and which to leave white. The printer can then duplicate the pixels or dots on the Apple screen, or use special software that produces even more complex images.

DROP ON DEMAND
An ink-jet printing technology that produces and throws onto the paper only the ink droplets needed to form the dark parts of an image or character. This contrasts with *continuous flow* methods, which constantly create droplets but divert those not needed before they reach the paper.

IMPULSE
Another term for the drop-on-demand technologies that send out ink dots only when needed to form spots on the paper.

INK CARTRIDGES
The replaceable plastic containers of ink ink-jet printers use. Some cartridges, such as those for the Hewlett-Packard ThinkJet, contain the pen body that sprays the ink.

ISO CHARACTER SETS
The various alphabets and symbols used in different countries, as standardized by the International Standards Organization. Having more than one character set is helpful if you want to write additional languages. ASCII (the character set Apple computers use) is the ISO International Alphabet Number 5.

LIGHTFAST
Inks that do not fade significantly during prolonged exposure to normal light. In ink-jet pigments, black inks are generally more lightfast than colors.

LOGIC-SEEKING
On printers that operate bidirectionally (outputting characters right to left as well as left to right), having the printer's internal circuitry decide from which end to start printing the next line, so as to minimize wasted traveling time for the printhead. Logic seeking can significantly speed up operation when the output contains many short lines.

NONCLOGGING
Ink-jet-printer designs that—to prevent the unused ink from drying out—do not need to be cleaned manually after each use. All models for use with Apples now claim to be nonclogging.

NONIMPACT
Said of ink-jet printers because they do not physically hit against the paper or ribbon. The LaserWriter and the Scribe are also nonimpact printers.

PIEZOELECTRONIC
An ink-jet technology using a crystal that moves in response to an electronic signal to snap the ink forward onto the paper. The Siemens printers for the Apple use piezoelectronic designs.

PITCH
The distance, measured in the number of characters per unit (in the U.S., per inch), a printer produces. Ink-jet printers for the Apple can generally print 10, 12, or 15 characters to the inch.

POLYESTER PAPER
A special paper that gives better results with ink-jet printers than does ordinary office bond. It is absorbent but does not encourage splotching or wicking.

RESOLUTION
For an ink-jet printer, the number of dots it can print in a given distance (usually an inch). For desktop models used with an Apple, typically this will be about 96 dots per inch.

SPARK
An ink-jet technology that uses the tiny blast wave from a small spark to throw the ink onto the paper. The HP ThinkJet uses a related method: The pulse warms a tiny heating element, which in turn vaporizes enough ink to cause the tiny blast.

SUBTRACTIVE PRIMARIES
The three pigment colors that can combine to form the full-color range. They are cyan (a greenish blue), magenta (a reddish color), and yellow. Color ink-jet printers use these colors and their combinations to make color images.

USASCII
The full name for the American version of the standard way of encoding characters as computer codes. It's more often seen as just ASCII. From the point of view of the rest of the world, it's the International Standards Organization International Alphabet Number 5. +

Beagle Bros Apple® Software Report

Call 619-296-6400 or write for free Catalog

Ad Number 222—Page 1 — *"All the News That Fits"* — *Summer 1985*

NEW! *ProDOS Disk with Tip Book!*

PRO-BYTER™

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ALL-NEW— BYTEZAP PRO

Inspect ProDOS™ and DOS 3.3 disks at the byte level. Make changes, improvements and disk or program repairs that are normally impossible. An *all-new program* with instantaneous block-to-block (or sector-to-sector) viewing.



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NEW ProDOS UTILITIES

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TEXT TYPER: Read and print ProDOS text files (on your screen or printer) without having to boot another disk.

MORE: Put time and date of save in your disk catalogs. Print alphabetized lists of your ProDOS catalogs (including *all* hidden subdirectories). Make any Applesoft command work like any other. Scramble Basic so only you can read it...

MACHINE LANGUAGE EDITOR

If you type in machine language programs from magazines, you'll *love* being able to make corrections by inserting and deleting code (no machine language knowledge required).

This easy-to-use editor also serves as a neat two-way-scrolling memory scanner. (Find out what's *really* going on inside your Apple's head.) The Pro-Byter manual shows you where in memory to look to find some very interesting stuff.

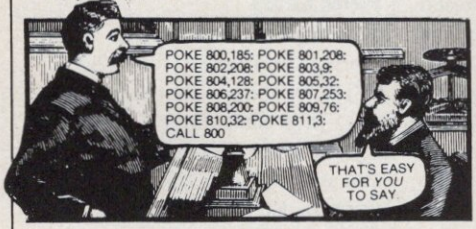
PLUS ALL-*NEW* APPLE TIPS

From the authors of DOS BOSS (Bert Kersey and Jack Cassidy)—page-after-page of juicy tips, experiments and inside info about your Apple. Learn secrets about Apple's new ProDOS operating system and Apple disk structure.

The latest official version of ProDOS (V1.1.1 with the new "Bye" command) is included on the Pro-Byter disk.



You get a GOLD MINE of tips, including: How to use memory like an extra disk drive (ProDOS lets you load & save files in RAM), How to disable the LIST command so it says "File Locked", How to disable or swap ANY command, How to change "Startup" to any name, How to personalize ProDOS catalogs...



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21 USEFUL UTILITIES: ***List-formatter*** puts each statement on a new line with indented loops and printer page breaks. ***Multi-Cat*** lets you create multi-column catalog printouts. ***Filename Zap*** allows invisible and trick file names, etc. Utility City is for beginning as well as advanced Applesoft programmers—very educational.

NEW! *128K Extended Memory Utility!*

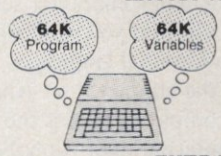
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PUT YOUR 128K TO WORK!

Even with 128K of memory, your Applesoft programs, pictures and variables only occupy and access the lower 48K. The EXTRA K disk contains several powerful programs that let you utilize *all* of that 128K capacity, speed and muscle.

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EXTRA K lets you have two 64K Apples and programs in memory at once and switch between them at will. Plus, you can even have a ProDOS™ Apple and a DOS 3.3 Apple in memory simultaneously and swap files back and forth without subjecting yourself to Apple's *Convert* program.

EXTRA-FAST COPIES

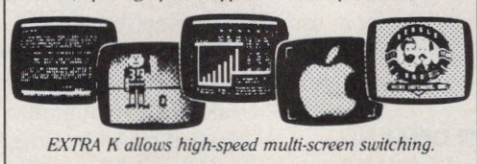
Make disk copies fast and "on-the-spot" without re-booting! EXTRA K's "nibble copier" duplicates *and verifies* unprotected disks in 35 SECONDS instead of 1½ minutes. Thanks to your Apple's 128K, only 3-4 passes per disk are necessary.

EXTRA FEATURES

Compare any two disks, byte-for-byte. Create "dual personality" ProDOS/3.3 disks. Peek and poke auxiliary memory. Keep a live "logbook" of everything that has appeared on your text screen and review it when you want...

EXTRA SCREENS

Store all kinds of images in memory and display any one (all or part) instantly. Up to 7 hi-res pictures or 62 text screens can be stored at once. Call several pictures to the screen per second, opening up new Apple animation possibilities.



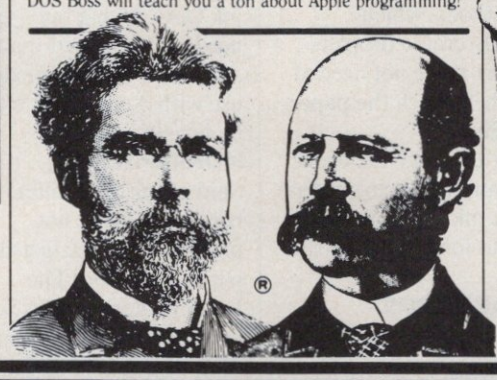
EXTRA K allows high-speed multi-screen switching.

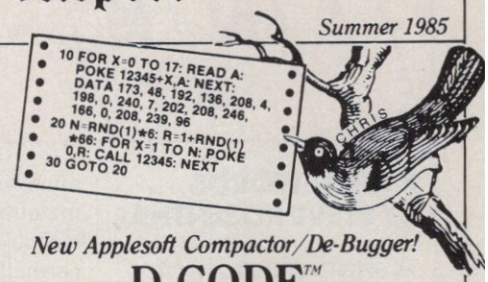
DOS BOSS™

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CUSTOMIZE DOS 3.3

Change *Catalog* command to *Cat,* or *"Syntax Error"* to *"Oops!",* or anything you want. ***Protect your programs:*** An unauthorized Save-attempt can print "Not Copyable". List Prevention, other useful tips and fascinating experiments. DOS Boss will teach you a ton about Apple programming!





New Applesoft Compactor/De-Bugger!

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PROGRAM PACKER

D CODE squeezes all of the wasted and unused bytes out of your Applesoft programs, saving valuable memory space and increasing your programs' speed and efficiency.

Automatically combine program lines, shorten variable names and/or remove REMarks. D CODE also uncovers wasted program lines that can't possibly be executed.

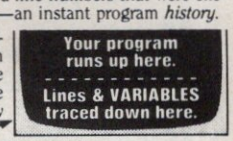
AUTO-PROOFREADER

Keyboard errors are caught as you type. If you enter an illegal program line, you are told immediately—*before* you (or worse—someone else) runs your program. Or you may simply type "CHECK" to scan an *entire program* in a couple of seconds and uncover potential crashes. If no mistakes are found, you get an immediate "NO ERRORS" message.

SUPER-TRACE

When a program stops or crashes, type "DUMP" to see the last 10-10,000 statements and line numbers that were executed, in the order executed—an instant program *history.*

D CODE features sophisticated "live" tracing too, with each executing statement, line number and selected variable values appearing in a window at the bottom of the screen:



BREAKPOINTS

D CODE lets you set up de-bugging "breakpoints" so your program stops when you want. For example, you can ask that your program be stopped the moment X gets set to 99, or the 3rd time a particular program statement is encountered.

LIGHTNING-FAST FIND!

D CODE lets you find strings and variables *fast*—even large programs can be searched in about *2 seconds!* All lines with a specified word are automatically listed with the word highlighted. This feature alone is worth the price of D CODE.

GPLE COMPATIBLE

D CODE remains "transparent" to your programs and is fully-compatible with GPLE, Double-Take, ProntoDOS, etc.




```
1  HOME: HTAB 5: POKE
   33,28: FOR C=1 TO 92:
   POKE 50,255-192*
   (C=4 OR C=64)
9  J=J+1-31*(J=31):
   PRINT CHR$(9+(J=1));
   SPC(2+(J<10))J;:
   NEXT: PRINT
85 POKE 33,1: PRINT
   "JULY..AUG..SEPT...."
```

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I. O. SILVER is *both* a thinking person's strategy game and a fast-action arcade game. Your job is to create a hi-res "Super Computer" on the screen while avoiding a pesty gang of computer bugs. I. O. Silver's Strategy Workshop lets you plan your moves before each level. Excellent high-speed animation and hi-res action. Great for ages 12 & up.

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TRIPLE-DUMP lets your dot matrix graphics-capable printer print *(1)* Hi-Res and Double Hi-Res graphics. *(2)* Lo-Res and Double Lo-Res graphics. *(3)* Forty and 80-Column text screen text.

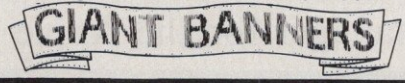
All kinds of images can be transfered to your printer with absolutely no programming knowledge. *Or* you can call Triple-Dump's routines from your own Applesoft Basic programs.

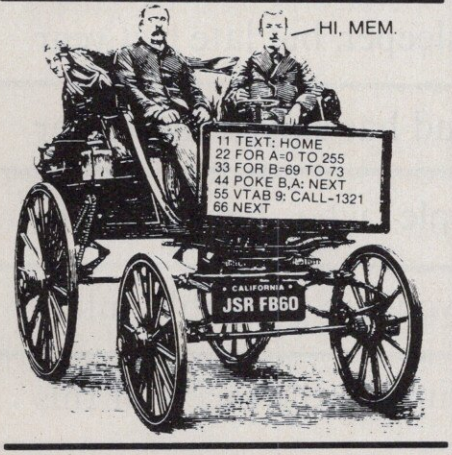


TRIPLE-DUMP gives you a full range of special effects—crop, rotate, magnify, compress, adjust density, etc.

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Print big signs and messages of all kinds (with 8½" high letters) on *any* kind of dot-matrix or letter-quality printer.





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Organize your disk library! FATCAT enters all of your ProDOS and 3.3 disk catalogs into one or more "Master Catalog" for fast searching, sorting and printing. Find the files you're looking for and eliminate space-wasting duplicates.

You can update your Master Catalog at any time by simply letting FATCAT read in your new or altered disks.

ALPHABETIZE FILE NAMES

FATCAT will sort your ProDOS and 3.3 disks so they catalog in alphabetical order. Or you can re-arrange file names in any order. *Compare* any two files too, and find the differences.

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DISKQUIK makes your Apple IIc or 128K IIe think it has an extra drive connected to Slot 3. It's just like using a super-fast (hard-disk speed), silent drive. Catalog with a "CATALOG,S3" command. Save and load all kinds of files to and from RAM with normal commands (holds about *half* the data of a floppy).

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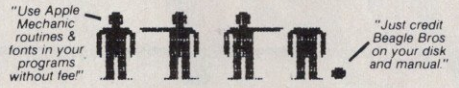
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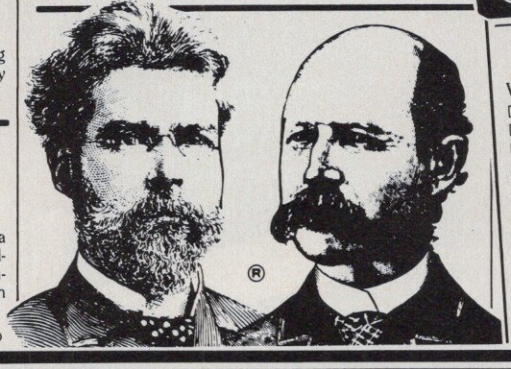
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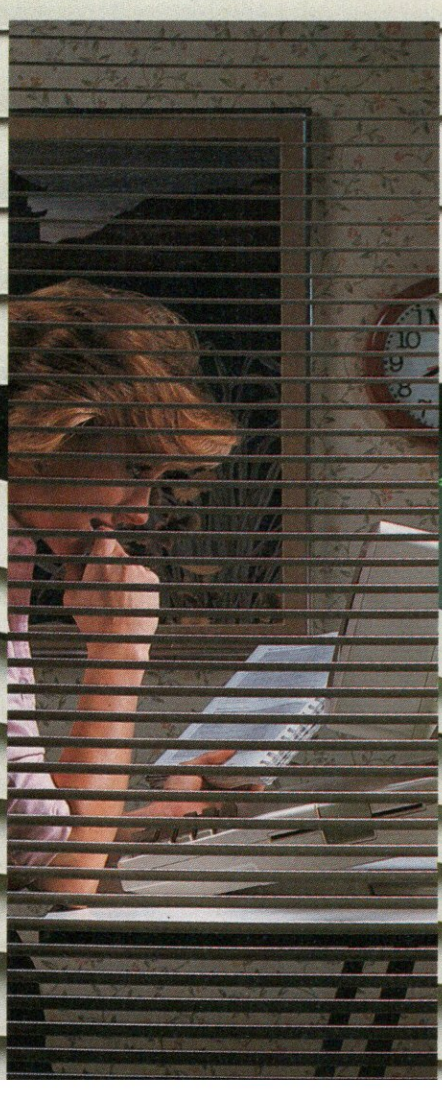
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Exploring AppleWorks

When AppleWorks, an integrated word processor, spreadsheet, and database manager for the Apple II, was introduced a year ago, it was a real sleeper, but late last year it skyrocketed up to the top of the charts and has stayed there ever since. If you're one of the many people who have bought AppleWorks, you are probably interested in exploring all the facets of this versatile program. We first introduced AppleWorks a year ago in "Enter the

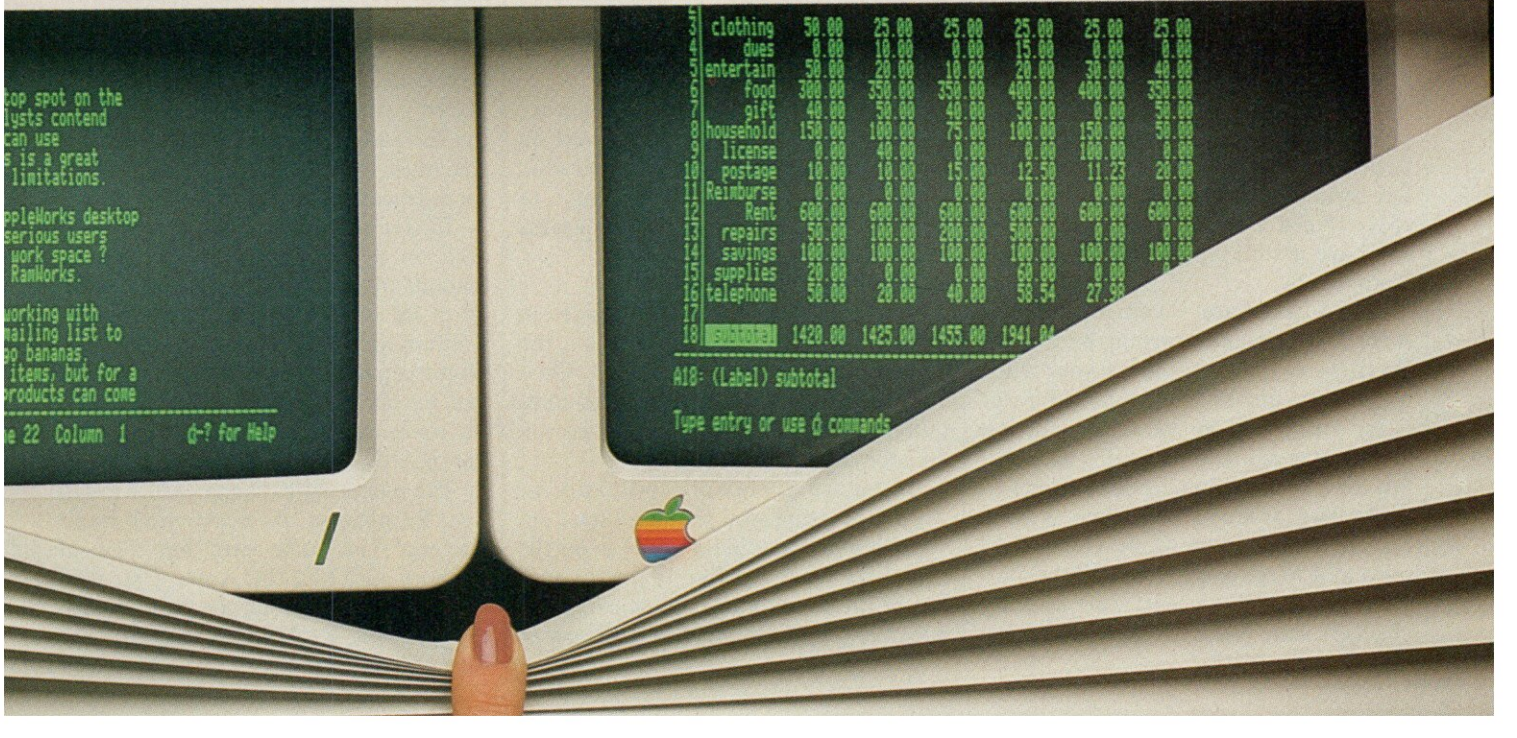


DOW/CLEMENT PHOTOGRAPHY



Three Dimensions of AppleWorks," (July 1984, pages 41–44). This month we present three articles to help AppleWorks owners get the most from their investment. The first article, "Amplifying AppleWorks," covers a wide variety of add-on software products such as spelling checkers, mail-merge programs, graphics programs, and others. The second article, "Business AppleWorks," teaches you how to set up sample records for a small business. The final article is "Personal AppleWorks," which takes a look at how to use AppleWorks for recording and analyzing home finances.





PART I
BY MICHAEL CALLERY

AMPLIFYING AppleWorks

Bigger desktops, mail merge, spelling checkers, and more

AppleWorks has overtaken Lotus 1,2,3 in the top spot on the computer-software lists. Some industry analysts contend that people are buying Apples just so they can use AppleWorks. They are justified—AppleWorks is a great program, but, great or not, it does have its limitations.

On a 128K Apple IIe or IIc computer, your AppleWorks desktop is large enough for many applications, but serious users inevitably run out of space. Need a larger work space? You can have it with Applied Engineering's RamWorks.

The database component of AppleWorks makes working with mailing lists a snap, but try to use your mailing list to create a customized form letter and you'll go bananas. Cutting and pasting is fine for a couple of items, but for a list with hundreds of names—ouch! Two products can come to your rescue: HabaMerge from Haba Systems and Megahaus' MegaWorks.

Can't spell? At least two spelling checkers can proof your AppleWorks text files: The Sensible Speller from Sensible Software and Megahaus' MegaWorks.

Want to visualize your spreadsheet? GraphWorks from PBI can convert an AppleWorks spreadsheet into a graph.

By increasing the versatility of AppleWorks, any of these programs can increase your productivity.

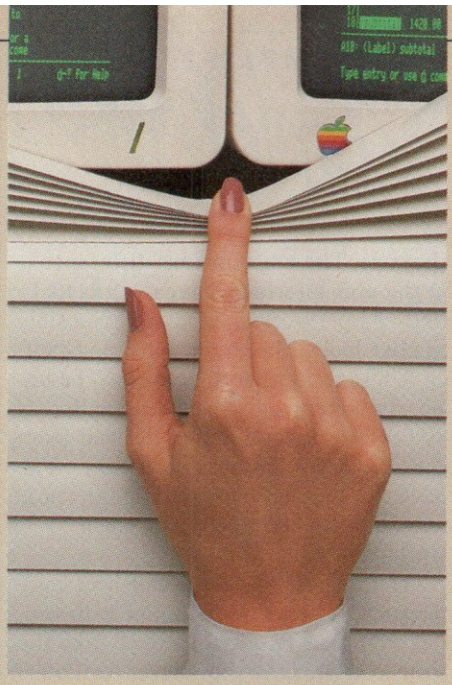
Spreading the Spreadsheet

The AppleWorks desktop resides in RAM, and its size depends on the amount of RAM in your system. On a 128K Apple IIe and on Apple IIc computers, the standard desktop gives you an active memory of 55K.

If you use AppleWorks primarily for word processing, you shouldn't have severe memory problems—55K is on the hefty side for a text file. If you do happen to fill the desktop, you can split the document into chapters or sections of manageable size. It's more difficult to split a database or spreadsheet file, though. If you must split a database, you'll have to do all searches and reports twice, once for each separate file. Similarly, if you split a spreadsheet, you can cut and paste a section of one spreadsheet into a second spreadsheet to carry a balance line into a third, but the cut-and-paste process is annoying if you must do it each time you use the spreadsheet.

To get a larger AppleWorks work area on a IIe, you can increase the amount of RAM available to the program by replacing your Extended 80-Column Card with a compatible, but larger-capacity, card. Apple IIc owners can purchase products that plug into the main circuit board to increase system RAM.

The increased-capacity card I tested was RamWorks from Applied Engineering. The basic card has 64K of memory just like the Apple Extended 80-Column Card, but you can add additional 64K RAM chips to extend the



card's capacity to 128K. If you have greater memory needs, you can add a circuit board that plugs into RamWorks piggy-back fashion for an additional 128K of memory on the card. If you need still more memory, RamWorks does accept the more expensive 256K RAM chips (like those used in the Macintosh) for a total of one megabyte of memory. Furthermore, you can mix 64K and 256K chips, which gives you an incredible range of memory options.

Pumping up your 80-Column Card is the easy part. Unfortunately, your Apple won't be able to notice the extra memory unless you modify your software to recognize it. Applied Engineering sells software that allows its card to work with DOS 3.3, ProDOS, Pascal, CP/M, AppleWorks, and VisiCalc.

The DOS 3.3, Pascal, ProDOS, and CP/M software allows you to set up a RAMdisk, a portion of RAM that looks to the Apple like a normal floppy disk. You can transfer programs or data files to the RAMdisk with the FID program supplied by Apple on the DOS 3.3 System Master disk, or the ProDOS Filer. All disk operations become incredibly fast with the RAMdisk.

The computer doesn't actually operate faster than usual; only disk operations accelerate, a result of the RAMdisk's absence of slow mechanical parts. When you turn your computer off, or if there is a power outage, all data on the RAMdisk will be lost. You must remember to copy data from the RAMdisk to a floppy disk before turning your system off.

A RAMdisk does not increase the size of your AppleWorks desktop, but Applied Engineering's AppleWorks Expand does. This program modifies your AppleWorks start-up disk to use all the memory on the 80-Column Card. Your desktop can be as large as 736K when you have a one-megabyte RamWorks card. You'll note no real difference in AppleWorks, although the 736K Avail. notice at the bottom of the AppleWorks screen may startle you.

Once you have exceeded the 55K limit of a standard AppleWorks desktop, you will not be able to load the file back into a standard Apple, and unless you have a larger-capacity disk drive, you cannot save a file that is larger than 140K. In practice, these numbers are actually smaller. AppleWorks does not let you store the full 140K capacity of an Apple floppy, nor does it allow you to create a full 55K spreadsheet. The actual capacity depends on what else you do with your desktop and files.

With the prices of hard disks falling daily, you should consider a hard disk if you need large files. One warning, though: AppleWorks must recalculate, search, and sort at the standard Apple speed. You'll have time for a coffee break—and more, in fact—with a 736K spreadsheet.

Accelerators such as the McT SpeeDemon should help speed up recalculation. Other accelerators, such as Titan's Accelerator with its own RAM, will not help, nor will you get the extra desktop space. These devices use only the RAM on the accelerator card, not the extra RAM on the 80-Column Card (see "The Endless Apple, Part II," *A+*, March 1985, pages 147–163).

Mail Merging

The most glaring omission in AppleWorks is a mail-merge capability. Mail merging is the ability to take a database file (a list of names, addresses, and other information) and combine it with a letter or other document. A mail-merge program assures that the proper "dummy statements" in the document are replaced by the information in the database file. Thus, a letter's salutation might read, "Dear %NAME,". The mail-merge program can find Arthur Jones in a database file, replace the %NAME, and print Dear Arthur Jones,. For a few letters, mail merge is more trouble than it is worth, but for a mailing to a users' group, a church's membership, or your entire client list, it is a godsend.

The simplest way to merge a database (the mailing list) and a document (the letter) in AppleWorks is to cut and paste the information from the database to the document, a tedious task indeed. HabaMerge and MegaWorks can both save you from this drudgery by producing mail-merged documents, but they are different in operation and capabilities.

HabaMerge

HabaMerge combines a database and documents you've produced with the AppleWorks word-processing program. When HabaMerge finds a ^1 in your document file, it brings in the first field of your database file. You can have as many as nine fields in your database. When you've printed out the first letter, HabaMerge produces another letter, using the second record of the database file, and so on until it's produced a letter for each record in the database. You can choose to print to the screen or to the printer, and the printer options allow for single or continuous forms.

If you want to produce a mailing to only a selected portion of your database, you must use AppleWorks' sorting capabilities and create a subset database to use in the mail merging. HabaMerge does not merge the actual database file, but works with a Print to Disk file. If you change your database in any way, you must create another disk file for mail merging.

In addition to facilitating mail merging, HabaMerge also allows you to print mailing labels from your database file. The mailing-label Print function is quite flexible and should accommodate most types of commer-

cially available continuous-form mailing labels.

MegaWorks

MegaWorks' mail-merge function is conceptually similar to that of HabaMerge. You must first prepare a document and a database file. With MegaWorks, you have to prepare both files with AppleWorks' word-processing program. Where you want a merge into your document, you must include something like Dear $$Name, where $$Name represents a name in a name field in the database. The dollar signs are essential.

If you want to use an existing database file, you must cut and paste the appropriate records into the word-processing program and then save the list from the word-processing program. MegaWorks requires special characters to delimit the records. The documentation does a good job of explaining the process of constructing the list or database file.

When you have created and saved your list and your document, you must exit from AppleWorks and boot MegaWorks. Selecting merge two AppleWorks documents from the MegaWorks main menu gets you a prompt for the name of the files to be merged and ultimately produces a third AppleWorks word-processor document that contains the merged documents. To print your form letter, you have to return to AppleWorks and use the standard AppleWorks word-processor printer functions.

Spelling Made Simple

AppleWorks uses the ProDOS operating system, and any spelling checker that can check ProDOS files should be able to check AppleWorks files. The popular Sensible Speller from Sensible Software is available in a ProDOS version that works with AppleWorks files. MegaWorks features an AppleWorks spelling checker in addition to mail merge.

Both are stand-alone programs; that is, you cannot operate the spelling checker from within AppleWorks but must save your file, exit, and boot the spelling checker. Both show you errors in context, with small pieces of text surrounding the apparently misspelled word. Both allow you to substitute the word in the checker's dictionary for the misspelled word without typing it. And both allow you to add words to the dictionary so that words you frequently use that are not in the main dictionary will not be flagged as misspelled.

If the two programs sound similar,

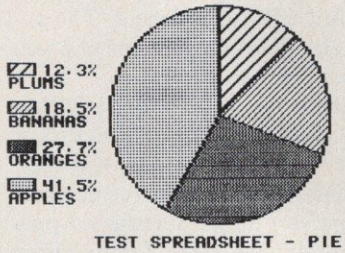
AMPLIFYING AppleWorks

they are. The most obvious difference is in the user interface. MegaWorks looks like AppleWorks, whereas Sensible Speller looks like, well, Sensible Speller. There is another difference. The basic dictionary of Sensible Speller is 80,000 words long and is derived from the *Random House Dictionary*. The MegaWorks dictionary is 50,000 words long, and its heritage is not given.

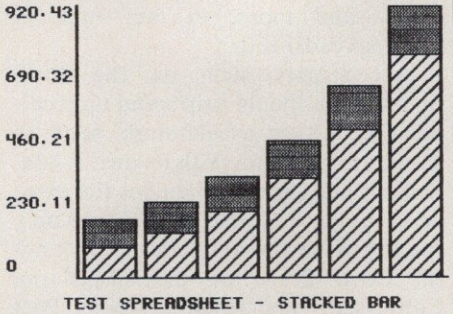
GraphWorks

Your AppleWorks spreadsheet may be immediately understandable to you, but your boss may not want to take the time to appreciate your clever formulas. He or she may prefer a quick overview. With GraphWorks, you can graph your AppleWorks spreadsheets—and we all know what a picture is worth.

As with the mail-merge programs, you must restart your computer to use GraphWorks. You cannot cut and paste a piece of a spreadsheet into GraphWorks. If you need the charts GraphWorks can produce, you'll have to live with this inconvenience.



TEST SPREADSHEET - PIE GRAPH



TEST SPREADSHEET - STACKED BAR

After you select a range of values and specify which type of graph you wish to produce with GraphWorks, pressing G gets you an instant graph of your data.

The introductory screen of GraphWorks looks like AppleWorks' main menu. The first time you use it, you must configure the program, specifying where the data disk will be and your printer configuration. After configuration, you will choose Add files to the Desktop, just as in AppleWorks. Your spreadsheet cannot be larger than 12K, or at least the data must be stored within the first 12K of the spreadsheet.

After loading the data, you enter the graphing portion of the program by choosing Work with one of the files on the Desktop from the GraphWorks main menu. The screen mimics AppleWorks' spreadsheet screen, but none of the AppleWorks spreadsheet-editing functions are available. If you want to change a value, you'll have to return to AppleWorks.

GraphWorks allows you to select (with an inverse cursor bar) a range of up to 24 values from the spreadsheet. The values can be arrayed in rows or in columns but must be consecutive. Cells within the selected range that contain blanks or text are graphed as a 0. Next, you must specify the type of graph you wish to produce: pie, line, bar, or stacked bar. Pressing G gets you an instant graph of the data. Upon exiting from the graphing screen, you can select another type of graph or an additional range of data. GraphWorks allows you to make line or bar graphs of up to six ranges of data points, with each range shown in a different symbol or pattern.

When the graph is to your liking, you can print it out. You cannot save graphs to disk or merge them with other AppleWorks documents, however.

Pretty Printing

Most of the current crop of dot-matrix printers allow users to load special fonts. You can use these fonts instead of the normal printer typestyle to achieve more attractive documents. Once you've loaded the fonts into the printer, they are accessible with commands such as those for underlining or boldfacing.

Why would you want a user-defined font? One possible application is for foreign-language word processing. Although most modern printers can print a few letters special to foreign languages—letters with accents, umlauts, and so on—you may not find all the characters or marks you need. Your user-defined font could contain these extra characters. Another use might be for mathematical symbols. Although the screen may show d2, your printer will print $\triangle^2$.

I tested Vilberg Brothers DMP Utilities with my Apple IIc and Imagewriter. The disk contains a variety of ready-to-use fonts and provides a utility for converting DOS Toolkit or Higher Text small fonts to the DMP Utility format. If you still need additional spe-

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cial characters, the Vilberg package includes an editor to customize a typestyle to your needs.

This program, and others like it, do not work directly with AppleWorks; rather, you use them before you enter AppleWorks to print. After you've loaded the printer with the font, AppleWorks uses the font like a special printer feature. You cannot, however, use the standard printer driver but must create a new printer driver that redefines one of the codes you don't normally use. This redefined command code changes the printer to the alternate font.

Applied Engineering's RamWorks is a boon to those who must use large files with AppleWorks. A fully configured one-megabyte RamWorks card costs about as much as an Apple IIe Starter System, however. Despite the high price, I like the product so much that I am buying one for my own system. Memory expansions smaller than one megabyte are also quite useful and provide the extra space necessary for many serious applications of AppleWorks.

If you already have an Extended 80-Column Card and don't want to sell it, you can cannibalize the card for RAM chips and transfer them to the RamWorks card for additional memory. If you work with DOS 3.3, ProDOS, Pascal, or CP/M programs, the RAMdisk utilities make this system even more attractive.

Both mail-merge products perform as advertised, but if you must create boilerplate letters with large blocks of text, only MegaWorks supports word-wrap when printing. Without word-wrap, you cannot merge anything that will push the line beyond the right-hand margin of your form letter. On the other hand, HabaMerge features sophisticated manipulation of data. You can, for example, extract a person's first name from a mailing list that stores only full names. HabaMerge also lets you print your mailing labels; with MegaWorks, you must print your labels from within AppleWorks.

Creating the mailing-list database in HabaMerge is easier than it is in MegaWorks, but in HabaMerge the database can have only nine fields, each as wide as your document. Because MegaWorks uses a word-processor file rather than a database file for the merge data, it is more flexible, if more cumbersome, to use. MegaWorks relies on the AppleWorks clipboard, so you will not be able to do large mailings in one pass.

AMPLIFYING AppleWorks

AppleWorks may spawn a whole industry of add-on products.

If you need spelling checking in addition to mail merging, MegaWorks may be your best choice. Sensible Speller can also check your AppleWriter 2.0 or other ProDOS text files, however, and has the larger dictionary.

GraphWorks is the first and, at this writing, only graphing program that works directly with AppleWorks. The 12K/24-point size limitations and the data setup requirements limit GraphWorks' use for many applications. Furthermore, because you cannot save a picture—only print it—you cannot use GraphWorks to create a disk-based slide show or bring the graph into a drawing program to beautify it. The latter ability may be essential for all but personal use, given the rough appearance of many GraphWorks graphs. If you can live with these restrictions, though, the product is solid and works well.

Finally, the Vilberg DMP Utilities can supply those characters you have always longed to see on your Apple or Epson FX or JX printer.

More to Come

I've looked only at the first crop of AppleWorks add-ons here. The popularity of AppleWorks—with its inherent limitations—suggests that, like VisiCalc, AppleWorks will spawn a whole industry of add-on products. Keep your eyes on *A+*. You can be sure that we'll cover the latest products that enhance your use of AppleWorks. ✚

Michael Callery spent a significant portion of the early 80s teaching the use of VisiCalc and creating custom models for the consulting firm of McMullen and McMullen. He is the coauthor of Apple Graphics: Tools and Techniques *from Prentice-Hall.*

▸ PRODUCT INFORMATION

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Applied Engineering
P.O. Box 768
Carrollton, TX 75006
(214) 492-2027
List Price: 64K, $179; 128K, $249; 256K, $399; 512K, $649; 1024K (1 M), $1199; DOS/ProDOS RAM Drive, $29; CP/M RAM Drive, $29; AppleWorks Expand (128K), $29; AppleWorks Super Expand, $39
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HabaMerge
Haba Systems
15154 Stagg Street
Van Nuys, CA 91405
(818) 901-8828
List Price: $69.95
CIRCLE 416 ON READER SERVICE CARD

MegaWorks
Megahaus
5703 Oberlin Drive
San Diego, CA 92121
(619) 450-1230
List Price: $125
CIRCLE 417 ON READER SERVICE CARD

Sensible Speller
Sensible Software
210 South Woodward, Suite 229
Birmingham, MI 48011
(313) 258-5566
List Price: $125
CIRCLE 418 ON READER SERVICE CARD

GraphWorks
PBI Software
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Foster City, CA 94404
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List Price: $79.95
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List Price: $50
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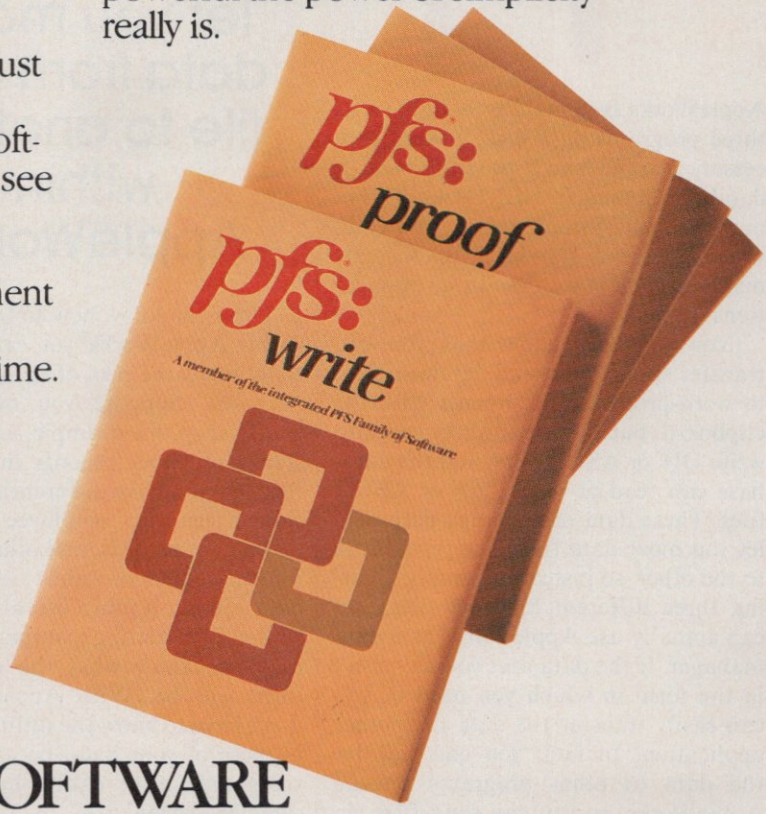
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PART II
BY CHARLES RUBIN

BUSINESS AppleWorks

Data-interchange pathways let you move data from one file to another within AppleWorks.

AppleWorks is generally thought of as three programs on a disk: a word processor, a spreadsheet program, and a database manager. Its Desktop file-management system and its ability to write and read standard file formats make it much more than three applications, though.

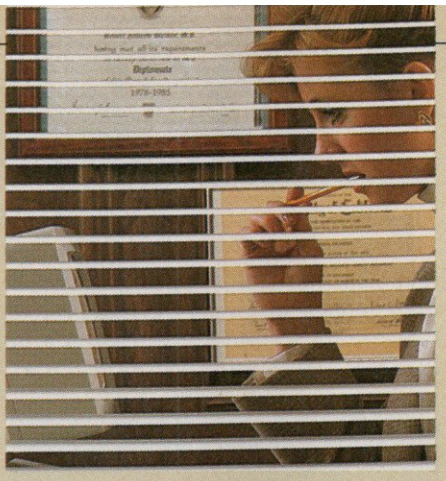
You probably know that you can transfer spreadsheet and database data to word-processor documents with the clipboard, but the spreadsheet can also write DIF or ASCII files, and the database can read or write DIF or ASCII files. These data-interchange pathways let you move data from one type of file to the other, so instead of simply creating three different kinds of files, you can actually use AppleWorks as a data manager. If the data that you have isn't in the form in which you need it, you can easily transfer the data to another application. In fact, you can transfer the data to other programs outside AppleWorks, so you can send files via modem, graph spreadsheet figures, or manipulate your data with more powerful spreadsheet or database programs.

Once you know how to transfer data within AppleWorks, you can use essentially the same pool of data for various purposes. Suppose you own an ice-cream shop, for example, and you have stacks of paper records in the office. Perhaps you have different folders for a vendor list, an employee file, some equipment records, and other groups of information. You want to organize this data and put it into a useful form, but if you're just getting computerized, you may not know what the most useful form will be. With AppleWorks you don't have to know the ultimate form or purpose of your data, because you can reorganize it so easily. Let's look at some examples.

Gathering Data with Lists

The first step in organizing data with AppleWorks is to gather it all in one place so you can work with it. You can create one large database file that contains much of your basic business information and then reorganize it as you please. Names, addresses, and telephone numbers are a good place to begin. Two useful groups of information are vendor-related data and employee-related data, so you can create one large file for each group that contains as much information as possible.

To create one database file called Employees, establish categories (fields) for each record (entry). The categories in this example are Name, Address, City, State, ZIP, and Phone. This basic information is useful in both the Employees and Vendors files, but you need enter it only once. Once you have created these categories in the Employees file, you can save this file to disk. Then use the Name Change command to change the file name to Vendors and save it to disk. You now have two separate files on the disk; each of them contains the same categories, and you can add categories to get more specific information in each file. To the Employ-



ees file, for example, you can add the following categories: Wage, Date Hired, Position, Social Security Number, Age, Experience, Education, Emergency Contact, and Emergency Phone. These categories allow the collection and storage of archival employee information, similar to the data in a paper personnel file (see figure 1).

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

Record 5 of 5
================================================================================
Name:
Address: -
City: -
State: -
Zip: -
Phone: -
Wage: -
Date Hired: -
Position: -
SS#: -
Age: -
Experience: -
Education: -
Emergency Contact: -
Emerg. Phone: -
--------------------------------------------------------------------------------
Type entry or use ⌂ commands                                    ⌂-? for Help
```

Figure 1: Categories for records in the Employees database file

For the Vendors file, you can add these categories: Product Name, Product Type, Vendor, Contact, Unit Cost, Model Number, Serial Number, Warranty Length, Date Purchased, and Terms. These categories let you store data about products you sell, such as ice cream, as well as equipment and services (see figure 2).

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

Record 12 of 12
================================================================================
Name
Address: -
City: -
State: -
Zip: -
Contact: -
Product Type: -
Product Name: -
Model No: -
Serial No: -
Unit Cost: -
Terms:
Warranty Length: -
Date Purchased: -
--------------------------------------------------------------------------------
Type entry or use ⌂ commands                                    ⌂-? for Help
```

Figure 2: Categories for records in the Vendors database file

Consult records in these large files when you want specific data about a particular vendor or employee, or sort the records in these files to create other data-management tools. With the Vendors file, you can sort the records by product type and then total the Unit Cost category to determine how much money is tied up in equipment, for example. If you had a temporary cash crunch, you could search the file for vendors whose terms were net 30 days, to identify those vendors who needed a letter of explanation. Beyond these simple manipulations, AppleWorks' data-interchange facilities make it possible to use portions of this data in other productive ways.

Analyzing Inventory

Suppose, for example, that you want to devise an inventory tracking system. The Vendors file already lists the vendors and products you sell, so you can reuse that information as the basis of an inventory-valuation worksheet. The only data you need for the worksheet is the product name and the unit cost. Using the database's report-format screen to define a new table-style report, you can delete all the other categories of data. Although the Vendors file includes vendors of services (such as janitorial) and equipment, along with vendors of products, we're now interested only in products because they are the items whose inventory levels change.

Extracting the product-related data for the inventory file is an easy task. Using the record-selection rules on the Report Format screen, you can ask for records in which Product Type does not equal Service, and the program will deliver only the products that meet this criterion.

You can then print the two categories to a DIF (Data-Interchange Format) file on disk. AppleWorks asks you to enter a name for the DIF file—call it Products. Next, use the Escape key to return to the AppleWorks main menu and choose the option to create a new spreadsheet file from a DIF file. Type in the name of the source DIF file (Products), and then specify a name for the new spreadsheet (call it Inventory). The database information is now in a spreadsheet format (see figure 3). Some of the item names in certain records may be wider than the spreadsheet's nine-character default column width, but you can easily widen columns to show all the data by using the Layout command.

The Inventory worksheet now contains product names and corresponding unit-cost figures. The category names don't transfer from the database file in DIF format, so be sure to label these two columns before doing anything else. After that, label additional columns for Quantity, Unit Price, Total Cost, and Total Price. Then enter formulas that multiply Quantity by Unit Price (to calculate Total Price) and Quantity by Unit Cost (to calculate Total Cost), and the worksheet is almost complete. The only remaining formulas are the @SUM formulas, the result of which is visible at the bottom of the Total Price and Total Cost columns—these columns give total cost and retail value of the inventory (see figure 4).

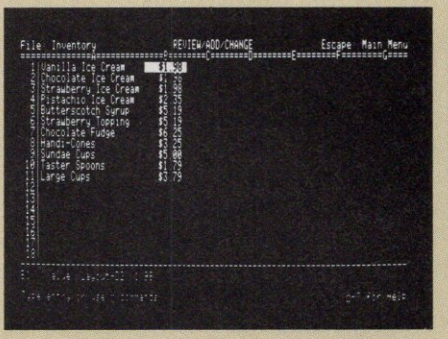


Figure 3: A spreadsheet created from a DIF file

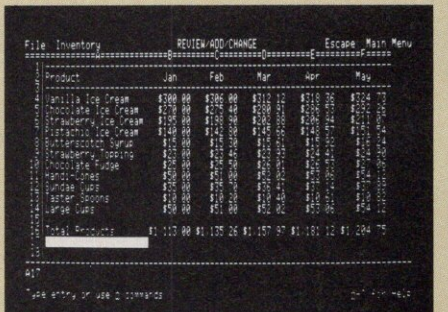


Figure 4: Inventory worksheet

When you work with a file on the AppleWorks desktop, you can easily change its name and alter it to perform another function. For instance, the In-

ventory worksheet is safely on disk and loaded to the desktop. Using the Name Change command, you can rename the worksheet, modify it, and then save it to disk under its new name. Here are two more examples of ways to recycle previous data with AppleWorks:

The Inventory worksheet is a good place to keep track of total inventory values, but it can also be used as a worksheet during physical inventories. With the Name Change command, change the filename (you could call the new file Inv.Worksheet), and then use the Blank command to erase the entries in the Quantity column. Once you do this, you will be able to take a physical inventory and write in by hand the actual quantity of each item. You won't forget to count certain items because everything you buy is already listed on the sheet.

This basic information has another use: projecting expenses. Working with the Inventory file again, you can change its name to Projection, blank out all the columns except the Product Name column, and enter column labels for each month in the year.

As you go through the year, you can refer to vendor invoices or your checkbook to determine monthly expenses on each item and salaries paid. Soon you'll have enough historical data to project future costs accurately. Don't stop with expenses and salaries—add a few rows at the bottom of the worksheet to track income each month. Subtracting total costs from total income enables you to track and project cash flow and to determine the best times in the future for advertising or expansion (see figure 5).

File: Projection REVIEW/ADD/CHANGE Escape: Main Menu

	Product	Jan	Feb	Mar	Apr	May
4	Vanilla Ice Cream	$300.00	$306.00	$312.12	$318.36	$324.73
5	Chocolate Ice Cream	$270.00	$275.40	$280.91	$286.53	$292.26
6	Strawberry Ice Cream	$195.00	$198.90	$202.88	$206.94	$211.07
7	Pistachio Ice Cream	$140.00	$142.80	$145.66	$148.57	$151.54
8	Butterscotch Syrup	$15.00	$15.30	$15.61	$15.92	$16.24
9	Strawberry Topping	$23.00	$23.46	$23.93	$24.41	$24.90
10	Chocolate Fudge	$25.00	$25.50	$26.01	$26.53	$27.06
11	Handi-Cones	$50.00	$51.00	$52.02	$53.06	$54.12
12	Sundae Cups	$35.00	$35.70	$36.41	$37.14	$37.89
13	Taster Spoons	$10.00	$10.20	$10.40	$10.61	$10.82
14	Large Cups	$50.00	$51.00	$52.02	$53.06	$54.12
15						
16	Total Products	$1,113.00	$1,135.26	$1,157.97	$1,181.12	$1,204.75
17						
18						

A1 (Label) Repeated--

Type entry or use / commands ^-? for Help

Figure 5: Use the Inventory file to record (and project) expenses (above), salaries, or income

Salary Projections

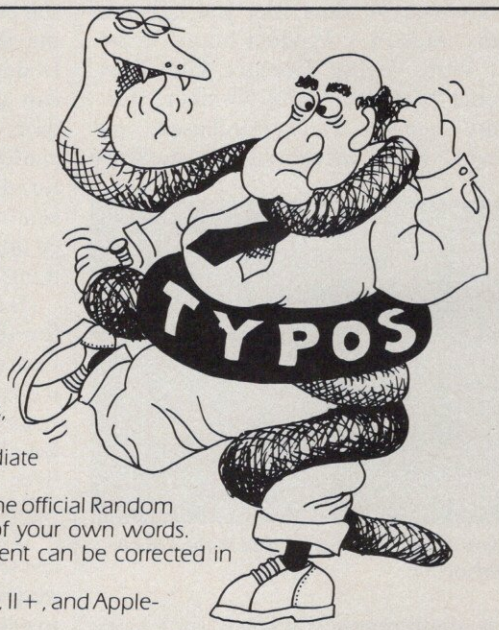
Data in the Employees file can be recycled the same way. Suppose, for example, that you've sorted through the database file and discovered that four employees have been with you for more than a year. You want to give them a raise, but you need to know the impact on the overall salary expenses.

The database records contain the salary information, but the database isn't exactly the ideal tool for doing this type of what-if analysis. To handle the problem, extract the data you need from the existing database file and transfer it to a spreadsheet.

Your first task is to define a report format. Call up the Report menu and choose the option to create a new table-style report. The Report Format screen shows the Employees file with all of its categories, although some of the categories will be off-screen to the right because all of them cannot be displayed at once.

For the salary-analysis spreadsheet, the only categories of information you need are Name, Wage, and Date Hired (for reference). Since you need to transfer only these categories to the spreadsheet, you should delete the other categories from the Report Format

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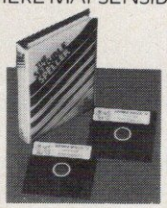
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CIRCLE 227 ON READER SERVICE CARD

12 Good Reasons Why RAMWORKS™ Is The Best Expansion Card For Your IIe

1 APPLEWORKS MEMORY Even though Ramworks enhances and expands a VAST ARRAY of other programs, Appleworks is our claim to fame. A 64K Ramworks will ADD 46K to your available desktop memory, a 128K Ramworks will ADD 91K, a 256K Ramworks will ADD 182K, and a 512K Ramworks will ADD 364K and a 1 meg Ramworks will give you nearly an 800K desktop. And it's all done automatically! When you plug in more memory chips into your Ramworks card, Appleworks will find them—automatically. Ramworks also increases the maximum number of records from 1350 to 4300.

2 APPLEWORKS SPEED AND POWER Ramworks does more than just increase the desktop memory (as if that weren't enough). With Ramworks, Appleworks will be able to run up to 20 times faster. If you buy a 256K or larger Ramworks card, Appleworks will automatically load itself in Ramworks. This greatly increases the speed at which Appleworks operates by eliminating all that nasty, time consuming disk access on Drive 1. These are but a few reasons why we say that Ramworks is Appleworks best friend.

3 EXPANDABILITY Ramworks was designed with the future in mind, as your needs increase, so can Ramworks. Clear instructions show you how to plug in more memory (up to 1 meg).

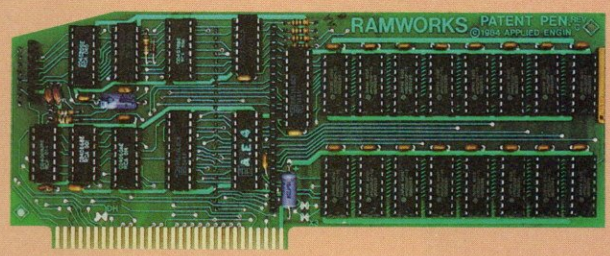
4 SPEED Today, as programs become more and more sophisticated, they inevitably become larger. And many of today's best selling programs (like Appleworks) won't fit in a 128K Apple, so many of these new larger programs continually go back to disk in search of more data. With Ramworks, you can have enough memory so that the entire program will be loaded into Ramworks' memory. This greatly increases the speed of software because your disk runs at 300 RPM, but Ramworks operates at the speed of light!

5 COLOR The same slot that's used for memory expansion is also the slot that's used for RGB color display, so all those lesser memory cards of yesterday make you decide in advance if you want RGB color. Only Ramworks lets you decide later to add RGB color. For only $129, an RGB option can be added to Ramworks to give you double high resolution color graphics and 80 column text. All with a razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of Ramworks and attaches to any Apple compatible monitor. Remember, you can order the RGB option with your Ramworks or add it on at a later date.

6 COMPATIBILITY, OF THE SOFTWARE KIND Programs like Appleworks, Magic Office System, Flashcalc, The Spread Sheet, Diverse-A-Dos, Supercalc, Magicalc and many others automatically recognize all or most of Ramworks memory (512K is average). The simple fact is that Ramworks is compatible with more off-the-shelf software than any other RAM card. Ramworks is 100% compatible with ALL software written for the Apple 80 column and extended 80 column card. Additionally, Ramworks can emulate other RAM cards so software written for other cards will run without modification. Software written for RAMWORKS will not work on other cards. We can emulate others, but others can't emulate us.

7 COMPATIBILITY, OF THE HARDWARE KIND Unlike others, Ramworks is fully compatible with hardware add on's from other companies, like the Sider and Profile hard disks. And Ramworks was designed in accordance with the official expansion rules defined by Apple so you don't have to worry about compatibility problems. As you continue to expand and make your Apple more powerful with other expansion products from Applied Engineering, you'll appreciate how each product has extra features designed to work with Ramworks and other products to give you a total performance package that is more powerful than the sum of its parts.

8 IT SELLS THE MOST Popularity translates into great software support because software companies can't support all RAM cards, they can only support the ones their customers are likely to own. And software companies appreciate the fact that when they write software for Ramworks in the IIe,



they're also writing software for our memory expansion card for the IIc, Z-RAM. And our customer list reads like the Who's Who of Apple computing with just about every software company in the land buying one, including Apple Computer (in the hundreds), Rupert Lissner, and Steve Wozniak (we didn't give one to Mr. Wozniak just to use his name, 2 one meg Ramworks were paid for at full price).

9 IT'S FROM APPLIED ENGINEERING Unlike most of the competition, we only make accessories for Apple, so we'll never spend your money on IBM product research. Applied Engineering's years of experience and wide product line really pays off, and because of our high sales levels we buy most of our I.C. chips factory direct. So don't let our low prices fool you, they're caused by high volume production. That's why we can offer the most memory for the least money. Guaranteed!

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screen, using the Delete command.

The database report at this point shows only the categories you want to transfer. All you have to do now is save the report to a DIF file on disk and use that DIF file as the source of a new spreadsheet file.

After the file is saved, return to the main menu and choose the option to create a new spreadsheet file from a DIF file. Enter the name of the DIF file and type a name for the new spreadsheet file (this name must be different from the DIF filename). The three categories of data now become three columns of data in a new spreadsheet. Before modifying the spreadsheet, insert two rows at the top and enter labels for the columns of data you have.

Next, insert columns for projected wage, hours worked, current weekly wage, and projected weekly wage. You might also add a column that shows the percentage of increase in pay. You can total the weekly wage columns at the bottom of the sheet to show the impact of the wages on your bottom line. You can now enter different hourly wages as projected raises and immediately see the impact on the total salary expense. You can also see what percentage of wage increase the figure represents.

BUSINESS AppleWorks

Another nice thing about showing percentages of increase in wages is that you can equalize the percentage among the four employees, even though they may be starting off with different wage levels (see figure 6).

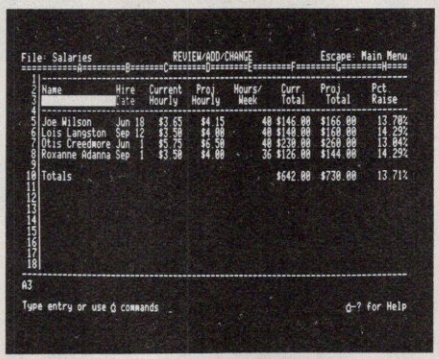


Figure 6: Salary-analysis spreadsheet

The Employees file can also produce telephone lists, basic tax-information reports for your bookkeeper, and other groups of data. If your business has fewer than 10 employees, you could easily use all 30 possible data categories in the AppleWorks database to gather a remarkably complete collection of information about employees, inventory, customers, or whatever. Once you have the basic collection of data, you can move sections of it to other files with other formats to suit your data-management needs. The examples here show files that are quite small—a few inventory items or a handful of employee names—but a typical small business has enough data to make these transfers well worth the time you would save if you didn't have to reenter redundant information each time you wanted to work with it in a different format.

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Charles Rubin's latest computer book, AppleWorks, *will be published in July by Microsoft Press. He is also the author of* The Endless Apple *and writes features and reviews for various computer publications.*



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CIRCLE 338 ON READER SERVICE CARD

PART III
BY CHARLES RUBIN

PERSONAL AppleWorks

The secret is to build a good information pool and then know what to do with it.

AppleWorks' spreadsheet, database, and word processor together have enough features to help us perform a wide variety of personal tasks. The program's data-interchange facilities let us transfer data from one application to another, so we can recycle data instead of retyping it. The secret lies in building a good information pool to begin with and then knowing what to do with it later.

Financial Facts

One handy type of file for personal use contains financial information. You may not be vitally interested in what your monthly income and expenses are, but you will need at least some of this data at tax time, and it's a lot easier to collect it as you go than to scrape it together at the last minute. Once you have it collected, you can use AppleWorks to analyze it in a variety of ways to help plan your financial future.

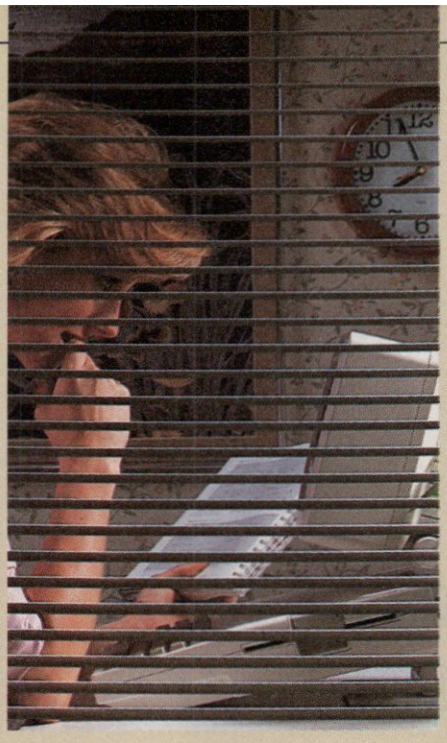
You can set up the main financial file as an AppleWorks database. The initial file can be simple, and you can add to it or modify it as your needs and interest dictate. To begin, you can simply create categories to record the date, type, purpose, and amount of transactions and use a Tax category to specify whether each transaction is deductible. This simple file can then hold records of all your financial activity (see figure 1).

The best way to assemble the data to enter into this file is to consult your checkbook register, since most of us conduct at least 90% of our financial business through one or more checking accounts. Simply flip through the register a page at a time, entering the date, amount, type of transaction, and tax status. For the Type of Transaction category, the simplest distinction is between expenses and income.

You can sharpen these basic distinctions with the Purpose entry, however, so you can divide your expenses into a series of categories such as Utilities, Rent, Food, Cash, Gifts, and so forth. When you apply these categories, though, be consistent—if you decide to list food costs under Food, don't forget and call such a transaction Groceries, or you'll have trouble finding it later (see figure 1).

What such a file does for you immediately is organize all your expenses so you can sort through them to determine your financial picture. At any time, you can easily use database reports to find out how much you've spent on a given category, how many tax deductions you have to date, or what your total monthly expenses are.

It's easy to define and store specific reports. Suppose, for example, that every month you'd like to know your total monthly expenses, your year-to-date income, and your year-to-date tax deductions. You can define a custom



report format for each of these areas.

To figure total monthly expenses, you can define the report, using the record-selection rules. You select all records where Type is equal to Expense. Then you define a category total in the Amount category. When you print this report, you see a list of all your expenses, with the total of the Amount category entries at the bottom of the report. You can name this report Expenses, and AppleWorks will list it as an option on the Report menu from then on. You can define and store up to eight report formats with the database (see figure 2).

If you've entered the expenses haphazardly and you want to see them in date order, you can arrange the report in the Date category before you print it. After the first month, you will be getting more than a month's worth of

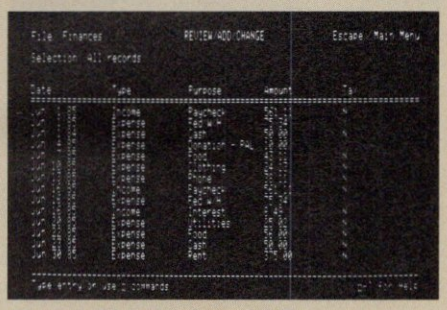


Figure 1: The main financial file

expenses in the report. If, for example, you have records for May, June, and July, but you want to know only total expenses for June, you can make that stipulation as part of the record-selection rules—you can ask for a report of all the records, where Type is equal to expense and Date is after May 31 and before July 1.

You don't have this problem with the year-to-date tax deductions or year-to-date income reports, because you always want to include all related transactions. Each report is easy to define. You simply use the record-selection rules to specify records where Tax equals yes or Type equals Income, and the database will select the records you want. You can then define a category total for the Amount category in each case, and your printed report will show the total value of these entries (tax deductions or income).

A final point to remember about database reports is that you can examine them on the screen. You may not want to waste paper when you're just checking to see what your year-to-date earnings are. AppleWorks displays only the first 80 characters of a report's width, however, so if your report format is wider than 80 characters, you won't see every category. In most cases, you can make individual categories narrower or delete unnecessary ones from a report to squeeze it into the 80-character limit for screen printing.

Because of these sorting and reporting capabilities, you can use this one database file to do with AppleWorks most of the basic things that standalone home accounting programs do. You won't have fancy graphs showing expense levels, but you can sort through records just as well.

Budgeting

Creating a budget is tricky to do with AppleWorks. You can include an extra category in the file for projected expenses, but the disadvantage of this approach is that certain monthly expenses (such as food) actually consist of several individual transactions, but your projections will be by the month, not by the transaction.

What you can do, though, is transfer some of the data from the main file into a budget spreadsheet. By transferring the Purpose entries from your transactions file, you can be on your way to a spreadsheet. First, you create a table-style report format in the database. For the spreadsheet, you will want row labels to reflect the types of expenses and income, and you can get these from the category listings in the database. After these, you will have monthly expense projections. You'll have to enter this data yourself, but you can get it all from the database in the form of printed reports.

The first step with the database report is to delete all the unwanted data categories. You are no longer interested in the date of the transaction, its



Figure 2: This report shows total monthly expenses.

amount, the type of transaction (all types of transactions belong in the budget), or whether or not the transaction is tax-deductible, so you can delete these categories. Now, the problem is that although every category of income and expense shows up in the file, the file contains more than one record for many categories—there will be several entries for food, income, rent, and so on. For the spreadsheet, you want only one label for each category.

The simplest way to deal with this hodgepodge is to arrange each category alphabetically in the database report. This way, all the similar-purpose entries (in Cash, Paycheck, or Interest, for example) will appear next to each other, and finding and deleting them once the data has moved to the spreadsheet will be a simple matter (see figure 3 for an example).

With your report format set up so only the category data will print out, you save the report to the disk as a DIF file and then return to the AppleWorks main menu. Then you create a spreadsheet from a DIF file and use your newly created DIF file as the source. When you name the new spreadsheet, your category data transfers to the first column in the spreadsheet. You'll probably have to widen the column with the spreadsheet's Layout command to see all the data in every cell (see figure 4).

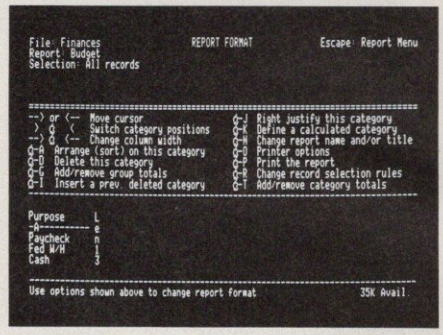


Figure 3: Grouping similar-purpose entries

Now, you can simply duplicate category names. After this, you'll want to move certain categories around (putting expenses in one area and income in another, for example) so you can easily get subtotals of expenses and income later. You can also insert rows to contain the subtotals. Each month in the budget should get a column label to the right of the purpose label.

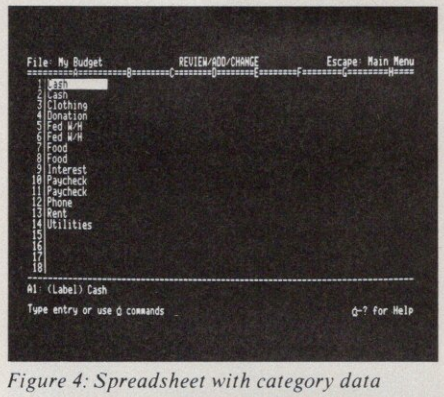


Figure 4: Spreadsheet with category data

After you've entered the basic labels, you can add some other features, such as a section at the bottom of the worksheet to show the variance between income and expenses and a column at the far right to show average monthly expenses for each category. You can use @SUM formulas to calculate all of the subtotals and totals, and the AppleWorks @AVG function is the one to use to create the Averages column (see figure 5).

Now for the data. You want to know the monthly expenses in each category, for each month. Suppose you have only two months' worth of trans-

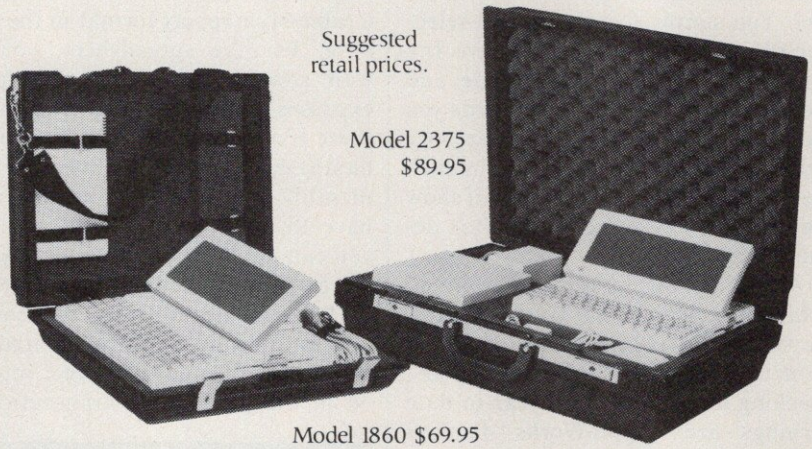
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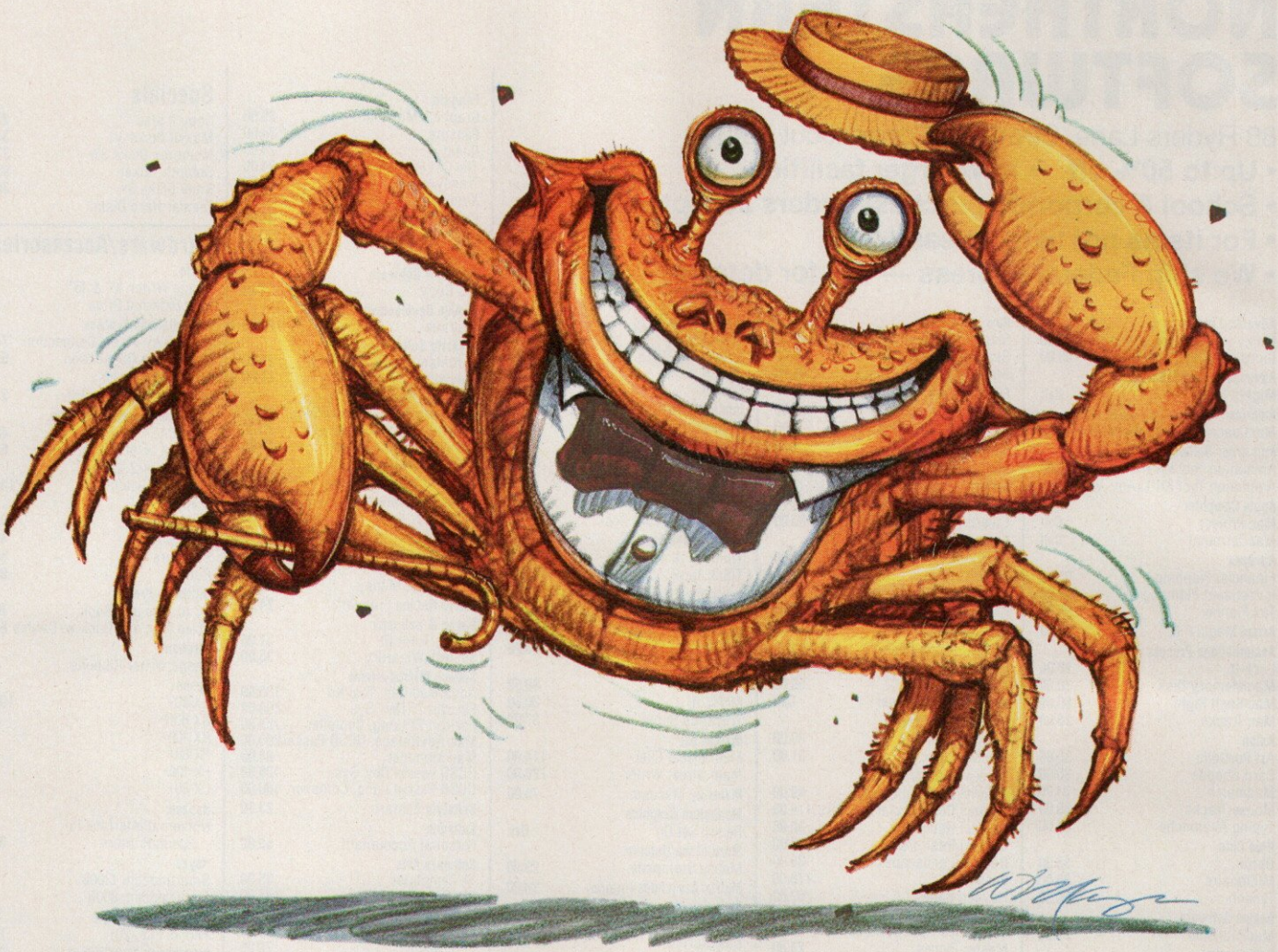
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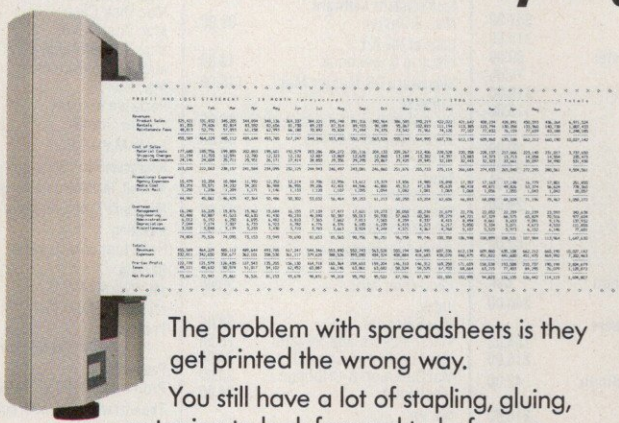
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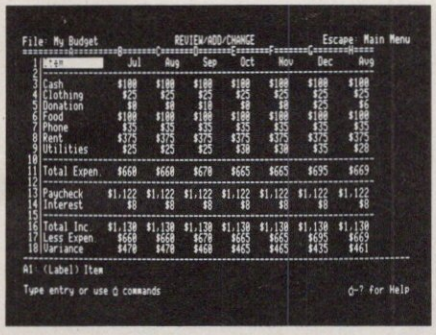
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CIRCLE 154 ON READER SERVICE CARD

action data in your database file. To get monthly totals for each expense or income category, you simply use the record-selection rules on the report-format screen to produce reports on individual categories.

For example, you can specify that the report contain records where Purpose is equal to Food, and Date is after May 31 and before July 1. These instructions give you all the food expenses for June. You can specify a category total in the Amount category before printing the report, thus getting a grand total of all food expenses.



File: My Budget — REVIEW/ADD/CHANGE — Escape: Main Menu

	Item	Jul	Aug	Sep	Oct	Nov	Dec	Avg
3	Cash	$100	$100	$100	$100	$100	$100	$100
4	Clothing	$25	$25	$25	$25	$25	$25	$25
5	Donation	$0	$0	$10	$0	$0	$55	$6
6	Food	$100	$100	$100	$100	$100	$100	$100
7	Phone	$35	$35	$35	$35	$35	$35	$35
8	Rent	$375	$375	$375	$375	$375	$375	$375
9	Utilities	$25	$25	$25	$30	$30	$35	$28
11	Total Expen.	$660	$660	$670	$665	$665	$695	$669
13	Paycheck	$1,122	$1,122	$1,122	$1,122	$1,122	$1,122	$1,122
14	Interest	$8	$8	$8	$8	$8	$8	$8
16	Total Inc.	$1,130	$1,130	$1,130	$1,130	$1,130	$1,130	$1,130
17	Less Expen.	$660	$660	$670	$665	$665	$695	$669
18	Variance	$470	$470	$460	$465	$465	$435	$461

A1: (Label) Item

Type entry or use ⌂ commands — ⌂-? for Help

Figure 5: A complete home-finance spreadsheet

Once you've set up this report format, you can go through each expense category by simply changing the category name in the record-selection rules. Instead of Food, you can specify Rent, Utilities, or whatever. You can quickly print each report to the screen and copy down the total expense for the month for later entry into the spreadsheet.

So, from this one file of basic financial transactions, you can develop four useful data tools that help you plan your income and expenses. At the end of the year, a few minutes will be all you need to gather all your tax-related data, and throughout the year you'll have a firm handle on what you're spending and why.

You can also expand this main financial file to include Name, Address, Account Number, and Balance categories. Such an arrangement lets you enter credit-card or installment-loan information. In that case, you can use the Amount category to record monthly installment payments, Type is still an expense, and Purpose contains the name of each credit card. Because the credit information is all in one place, you can get at it easily when you want to prepare a credit report for a loan application or quickly determine how much credit you currently have available.

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CIRCLE 236 ON READER SERVICE CARD

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Quiet and reliable, ink-jet printers produce high-quality black-and-white and color text and graphics.

MEET THE inkjets

What accessories for your Apple computer are uncommonly quiet and sometimes colorful and use a high-tech squirt gun? Give up? The answer: ink-jet printers.

Ink-jet printers are the newest addition to the already large group of available dot-matrix printers. They come in models that print in black and white, and others that print also in color. All of them are remarkably quiet while operating and tend to be more reliable than other types of computers because of fewer moving parts. We'll be looking at three black-and-white ink-jet printers—the Siemens PT88 and PT89 and the Hewlett-Packard ThinkJet—and two color "inkjets"—the Diablo C150 and the Quadram QuadJet.

What's So Jet-Set about InkJets?

The biggest attraction of ink-jet printers is the absence of noise. If you quickly tire of the screeching sound of most impact (or ribbon) dot-matrix printers, the ink-jet printer is a welcome alternative. Only laser printers can match or improve on the silence of an ink-jet printer, but at a much higher price. Another attraction of many (though not all) ink-jet printers is their small size and weight. Also, many ink-jet printers have ink cartridges that make changing them a neater operation than installing a new ribbon on most impact dot-matrix printers.

Some ink-jet printers offer more text-formatting features than others, such as underlining, bold print, different character sizes, and so on. The printers can switch among these formatting modes with short escape sequences (you use the Escape key) without making you resort to bit-mapping to put a new character set in place. All of the printers we looked at provide escape sequences to adjust the margins and the horizontal and vertical tabs and offer additional character sets beyond the standard characters. If you're interested in using an additional character set with your Apple II (such as French or Spanish), be sure to check the users' manual before you buy any printer, since these sets vary.

Ink-jet printers boast of higher reliability due to fewer internal moving parts, but this boast may be offset by the danger of possible ink clogging or ink spills. Although with proper care these things may never happen, you have to remember certain dos and don'ts (depending on the printer) before leaving the printer off for extended periods of time or attempting to move it after it's been set up.

Color ink-jet printers usually offer more speed and brighter colors than do impact dot-matrix printers with color ribbons. They do so because the ink-jet printers combine colors directly on the page without having to make multiple passes, unlike the color impact printers.

High-Tech Squirt Guns

Ink-jet printers print by using a process called "drop on demand." This process uses electrical signals to squeeze a diaphragm at one end of a chamber connected to an inkwell. The in-and-out motion of the diaphragm sucks tiny droplets of ink into the chamber and squirts them out through a nozzle onto the paper. The process is similar to what happens when you squeeze an oilcan. In the case of ink jets, however, the vibrating diaphragm sprays the ink out in precise dots to form the characters as the printhead zips across the carriage.

With a color ink-jet printer, you can print not only the four ink-jet colors themselves, but also combinations of these colors. The four ink-cartridge colors are usually black, yellow, cyan (blue), and magenta. The printer creates three secondary colors, such as violet, red, and green, by combining the primary colors at the same point on the paper. To achieve other shades, techniques such as alternating colors in small stripes are necessary to keep multicolor combinations from blurring.

Bleeding, or the blurring of images, can be a problem with ink-jet printers since the fibers in regular bond paper

DOW/CLEMENT PHOTOGRAPHY

QUADJET
Diablo



DIABLO C150



QUADRAM QUADJET

INK-JET PRINTERS

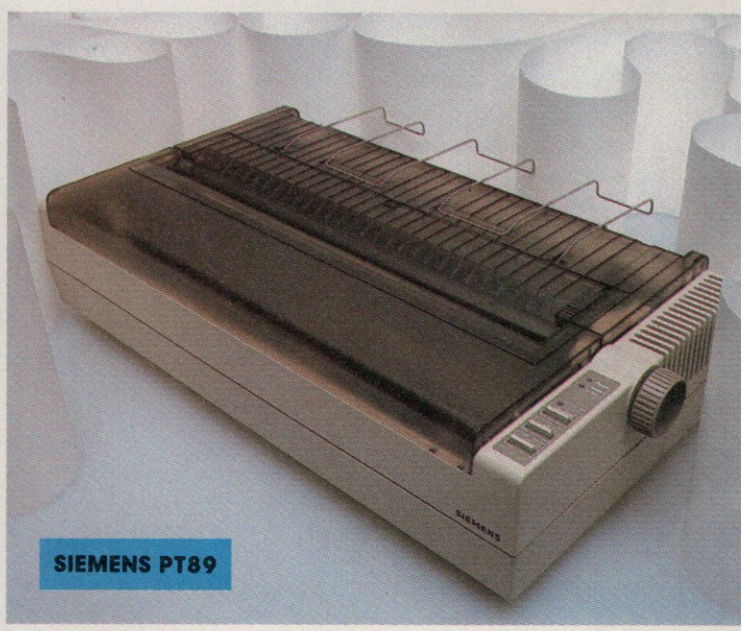
MANUFACTURER	DIABLO	HEWLETT-PACKARD
MODEL	C150	ThinkJet
PRICE	$1250	$495
COLOR	Yes	No
SIZE (H × W × D)	6.1 × 20.9 × 13.7	3.5 × 11.5 × 8
WEIGHT (lbs.)	24.2	6.0
CHARACTERS PER SECOND (cps)	20	150
NOISE LEVEL (DBA)	<55	<50
BUFFER SIZE (characters)	4000	1024



HEWLETT-PACKARD THINKJET



SIEMENS PT88



SIEMENS PT89

easily absorb the ink. For this reason, you need to use special, coated paper with an ink-jet printer to achieve good print quality and color. (That's not to say that you won't be able to read text printed on regular bond or typing paper.) The special paper is relatively expensive, but it does come in rolls, fanfold, and single-sheet formats.

Setting Up for Evaluation

All of the printers we evaluated work with Centronics-type parallel interfaces, although some also offer serial RS-232 interface options. If you have an Apple IIc or III computer, make sure you get the RS-232 serial version of the printer, along with the appropriate printer cable.

If you're an Apple II, II Plus, or IIe owner, you may have to buy an additional circuit card to put in slot 1. If you're interested in graphics capabilities, you will want to buy a graphics card that is compatible with both the printer and the graphics software you wish to use. Macintosh users need a special cable and software in order to take full advantage of the Mac's graphics abilities.

QUADRAM	SIEMENS	SIEMENS
QuadJet	PT88	PT89
$895	$745	$895
No	No	No
4.3 × 15.8 × 11.6	5.5 × 15.4 × 11.6	5.7 × 23 × 12.4
12.3	15.4	22.0
40	150	150
<50	≤45	≤45
80	165 (expandable to 4K)	165 (expandable to 4K)

Let Your Dealer Prove It

Printing text on any of the ink-jet printers was easy; the fun came when we tried some graphics software with each printer. One of them just stood there and beeped at us; another went berserk until we cut the power. If you're wise, you'll have your dealer prove to you that the printer you're interested in, your computer's interface, and the software you want to run are all compatible, before you make the purchase. Actually, letting dealers fiddle with the printer's DIP switches and scramble for interface cards and cables is one way of seeing if they know their stuff.

Siemens PT88 and PT89

For a truly quiet and fast black-and-white printer, you should try the PT88 or the PT89. These sister printers are identical except for the width of their carriages, and they are the quietest for normal operation of all those we looked at. The driving motor within the machine makes a soft whining sound as the carriage scrolls and almost no noise as the printhead moves across the carriage. The driving motor is fast, too. It took the Siemens printers 3 minutes and 15 seconds to print out this article. The PT88 holds roll paper, fanfold paper up to 9.8 inches, and single sheets up to 8.5 inches wide; the PT89 holds fanfold paper or single sheets up to 15.7 inches wide.

Both the PT88 and the PT89 include four different character pitches, sized from as large as 5 characters per inch (cpi) to 17 cpi. Escape sequences also exist for superscript, subscript, and underlining. Superscripts and subscripts come in handy if you footnote, or if you write mathematical or chemistry formulas, and so on. In addition to the standard character set, there are six international character sets (a total of 78 additional characters) that you can call up via control codes.

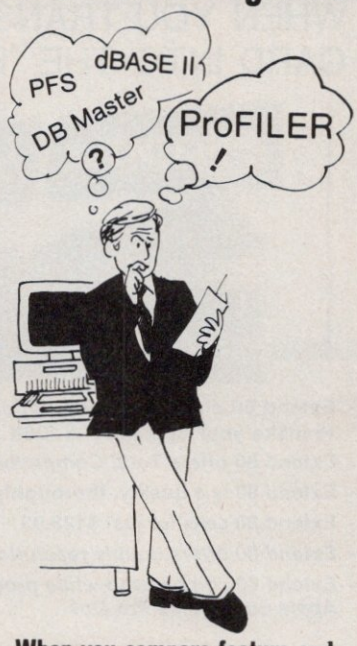
The Siemens ink-jet printers leave something to be desired in print quality. The dots that make up the characters are quite visible, giving them a grainy look that's similar to what you'd expect from most dot-matrix printers. Sometimes the printers seem to miss a pass over the paper, causing a blank horizontal hairline through the text letters. The Siemens printers allow you to print both text and graphics on the same line.

Hooking the Siemens PT88 or PT89 up to your Apple is almost a snap. Just make sure the printer's interface matches the port or card on your Apple. If your dealer helps you set up before you make the purchase, you may be able to avoid wading through the fairly technical users' manual—a task that requires strong determination.

Hewlett-Packard's ThinkJet

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Maximum Records per File	1500+	1000
(65,000 w/ ProFILE Hard Disk)	YES	NO
Report Generator Included	YES FREE	NO ($100)
Pro DOS Operating System	YES FREE	NO
Full Screen Editor	YES	NO
Works on Apple II+, IIe, IIc, III, Franklin	YES	YES
Arrow Keys function OK	YES	NO
Multiple Index Files	YES	NO
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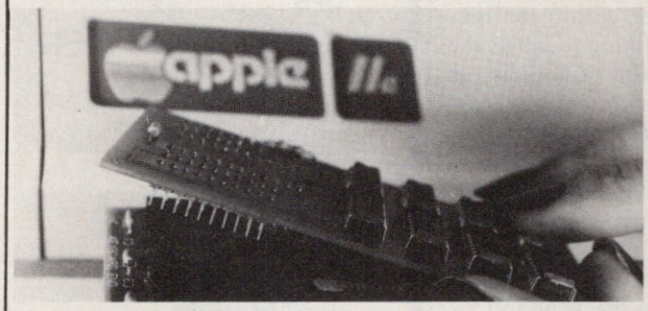
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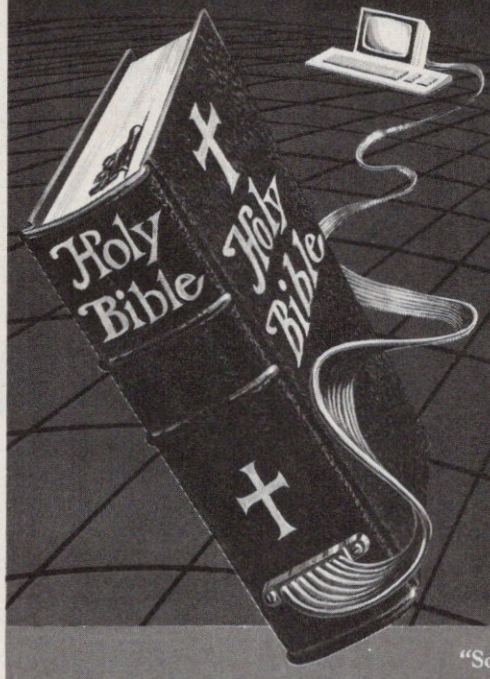
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Hewlett-Packard's ThinkJet is well deserved, especially considering the price of this printer, a black-and-white model that is small and packed with features. For instance, the ThinkJet provides four different character pitches, including one that HP calls Expanded-Compressed. What's more, you can do superscripts, subscripts, underlining, and bold characters. The bold text we printed, however, was only slightly different from the text in the Normal mode.

In addition to standard ASCII characters, the ThinkJet offers 78 characters in 6 international character sets and one alternate set of 128 characters called Roman Extension—quite an impressive variety.

The ThinkJet's size will probably surprise you. You might mistake it for one of those small thermal printers—it weighs only 6 pounds and is slightly larger than a shoe box. Its small size makes it especially convenient for use with the Apple IIc or Macintosh. Mac users will need the Jetstart software package from SoftStyle, which is a Macintosh printer driver for the ThinkJet.

The ThinkJet's print performance, however, is big for the price. Although the characters were a bit grainy, we had to pull out our magnifying glass to see the individual dots. For speed, the HP ThinkJet rated second in our contest, printing out this article in just under four minutes. The users' manual is also commendable—easy to understand, succinct, and the only manual we saw with an index.

The only disappointment that comes to mind is the difficulty we had in feeding paper into the ThinkJet. The carriage has a tractor-feeder but no knob for turning the carriage. With everything in such a small box, we found ourselves fumbling around a bit to get the paper in place and onto the feeders. The carriage is nothing more than two small wheels, each coated with a nonskid surface and each attached to one end of a metal rod. The absence of a standard typewriter-style carriage surprised us at first, but the ThinkJet's carriage poses no problems unless you have your heart set on using paper smaller than 8½ inches wide.

Quadram QuadJet

The QuadJet is another amazingly compact printer, considering the features packed into its small size. This color ink-jet printer features two different print pitches, a bold-print mode, and seven basic colors (not counting

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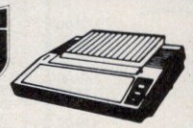
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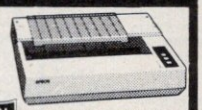
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CIRCLE 292 ON READER SERVICE CARD

white). Quadram's QuadJet is one of a number of ink-jet printers on the market today that are based on the Canon ink-jet engine. The QuadJet's four ink jets contain black, magenta, yellow, and cyan (blue) ink, and three other basic colors are easily available. Although Quadram calls these three secondary colors green, blue, and red, we felt they looked closer to green, purple, and orange. Still more colors are possible with alternate colors that print side by side.

Print quality on the QuadJet is a bit on the grainy side, with bold characters looking smoother than normal characters. Characters with curves in them (such as *r* or *g*) look slightly more jagged. Although the colors are nice on specially coated paper, they could stand to be somewhat brighter. Unfortunately, the QuadJet does an automatic line feed with each carriage return, which makes it difficult to print both text and graphics on the same line. Also, it is one of the slower printers, with a printing time of 12 minutes for this article.

The QuadJet can use either roll or single-sheet paper (no tractor-feeding is available). We found it easy to install the printer and to change paper and ink cartridges. Like battery packs, the two ink cartridges (one for black and one for colors) plug in behind a concealed cover in front. A concise and very readable users' manual is one of the reasons we experienced no problems.

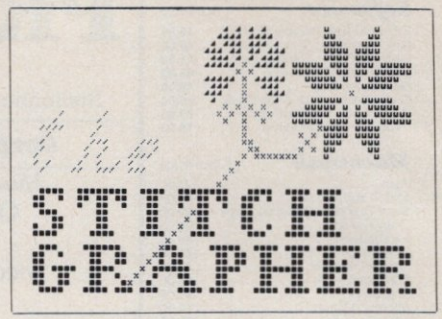
We found it easy to install the QuadJet and to change paper and ink cartridges.

Even though you can use any Centronics-compatible parallel port with the QuadJet for the Text mode, a graphics port or card simplifies the commands necessary to take advantage of the printer's graphics features. Quadram offers such a card for the Apple II, II Plus, and IIe called APIC/CG (Apple Parallel Interface Card with Color Graphics option).

Diablo C150

The print quality of Diablo's C150 color ink-jet printer is commendable. The near-letter-quality print is possibly the biggest attraction of the C150. The choice of seven colors (eight, counting white) doesn't hurt either. Weighing in as a heavyweight, compared to the other printers in this review, the C150 struck us as more of a business printer.

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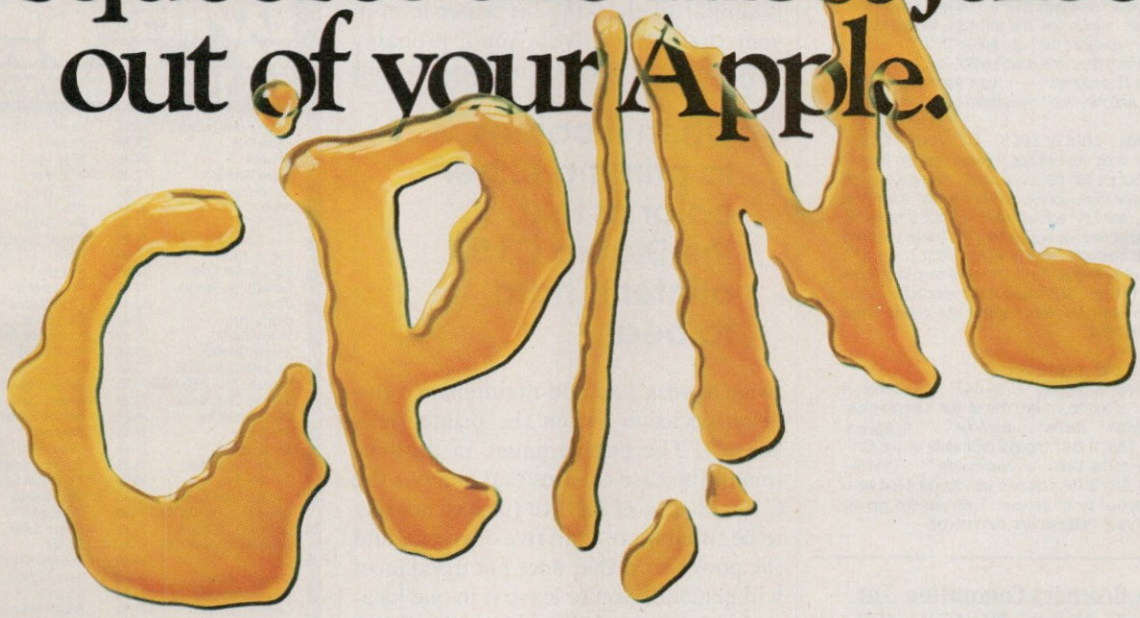
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CIRCLE 223 ON READER SERVICE CARD

Its price of $1295 does not do much to dispel this perception.

This printer takes a certain commitment to set up and maintain. You'll probably get your hands dirty with this one, since installing the ink cartridges is similar to checking the water level in your car battery. Also, you'll probably need to rinse the ink nozzles once or twice a week and add maintenance fluid on occasion (when the printer tells you to). The bubble gauge in the bottom of the case ensures that you put the C150 on a level surface (it does not like to be tilted more than five degrees), and the power cord that does not disconnect will persuade you to leave it in one location. Lights on the front panel tell you when an ink cartridge is empty, and installing a replacement color cartridge is quite easy when this happens.

When it comes to printing either color or text, the Diablo C150 printer is hard to beat.

When it comes to printing either color pictures or text, this printer is hard to beat. In addition to the normal character set, the C150 has 29 international text symbols for European applications and an additional 67 "mosaic" characters for graphics applications. The C150 was the only printer we reviewed that could print acceptable overhead transparencies—a definite plus if you give a lot of presentations. Also, printing both text and graphics on the same line is possible with this printer, making it a good choice for those advanced graphics applications.

If speed and fancy text features such as a variety of ready-to-use character pitches, international character sets, and bold print are what you're interested in, however, you might have to look elsewhere. This printer was the slowest in our contest, taking 17 minutes and 45 seconds to print this article. The excellent print quality and bright colors could be well worth waiting for, though.

How Do You Choose?

Obviously, the printers we have reviewed here are just a sampling of the available ink-jet printers, although far fewer ink-jet printers than impact dot-matrix printers are on the market. Assuming you're sold on the idea of getting one of these quieter printers, how do you choose among the available

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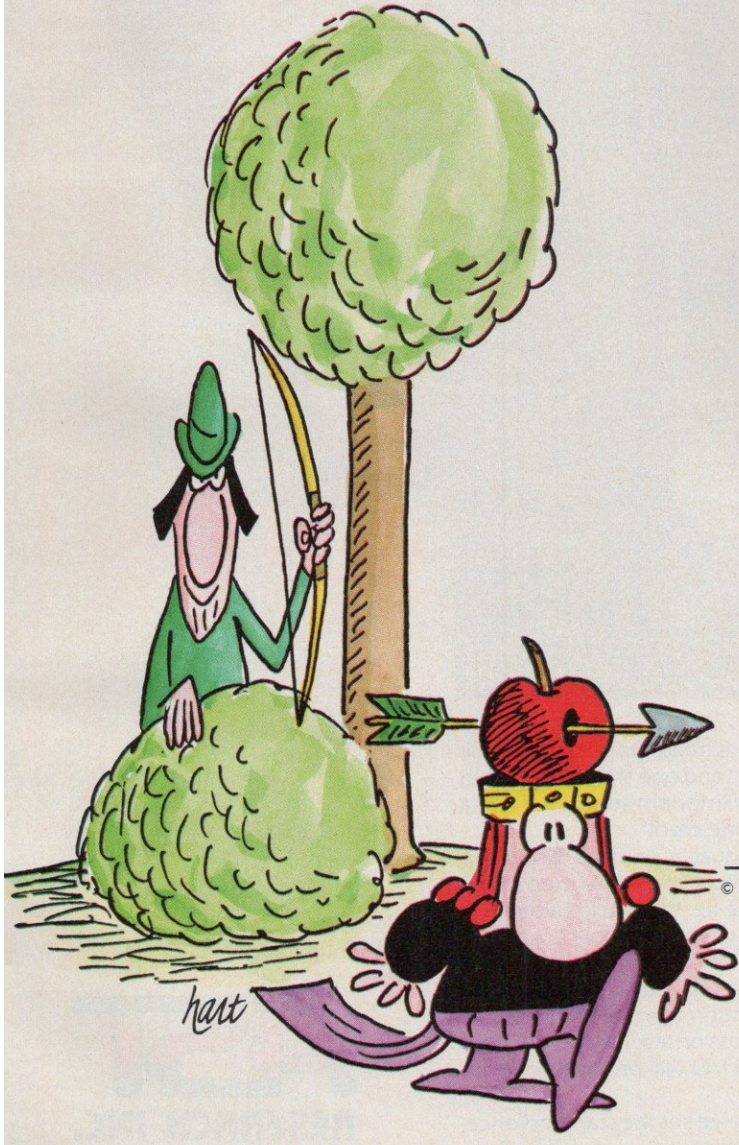
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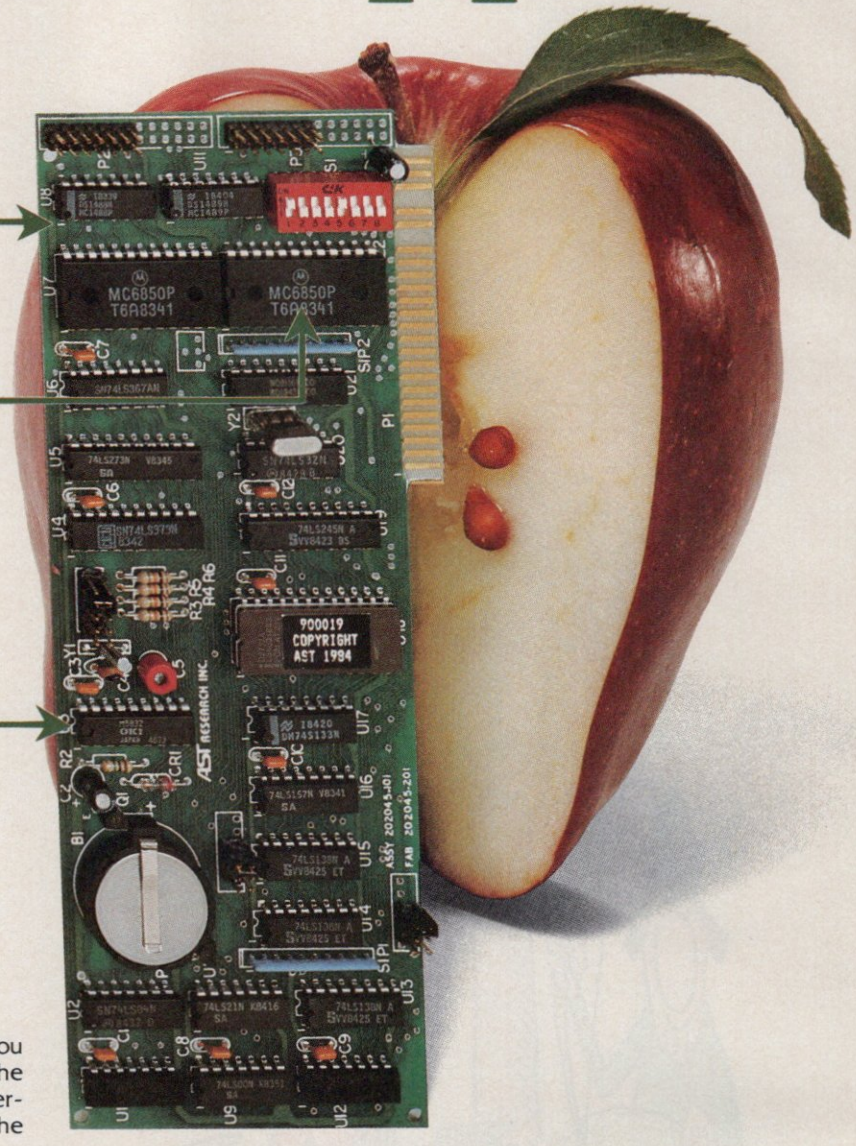
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CIRCLE 323 ON READER SERVICE CARD

models? As always, it's a matter of considering your needs and your budget.

Graphic artists are likely to be more interested in the bright colors and mosaic-character possibilities of a Diablo C150 than in the black-and-white text-printing features of the other printers. A writer or programmer who's on the go and needs something more compact might consider the portability and speed of the HP ThinkJet.

Either way, here are some good questions to keep in mind:

- Do you need to print text and, if so, what quality?
- Do you need color and, if so, what quality?
- What is your spending limit?
- Will the printer work with your computer interface and software?
- Do you need to buy an additional graphics interface?

A good dealer can help you out on the last two questions.

Once you've experienced the golden silence of an ink-jet printer in operation, there may be no turning back. ✚

Francesca Venning-Townsley, a writer/instructional designer, has written about computer products since 1982. David Townsley is a product engineer in the semiconductor industry and a frequent contributor to A+.

▸ FURTHER INFORMATION

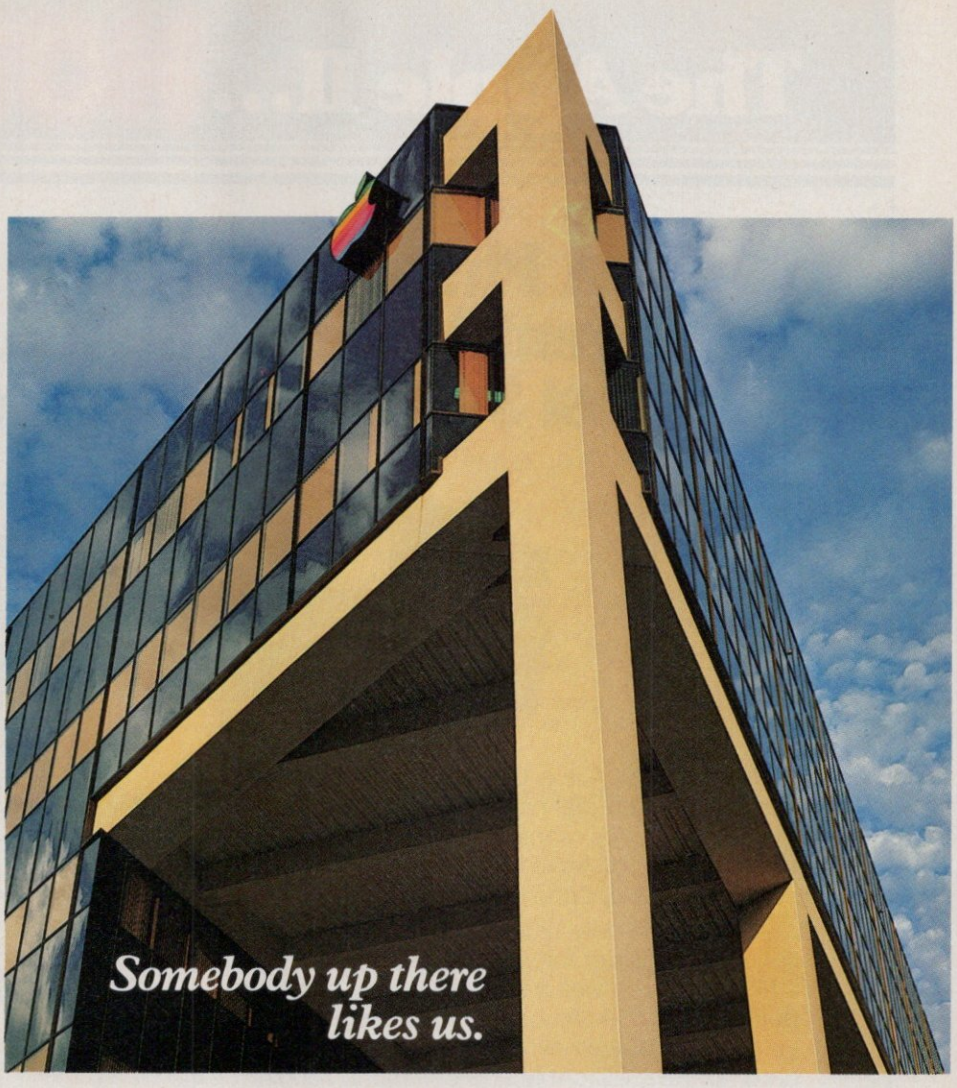
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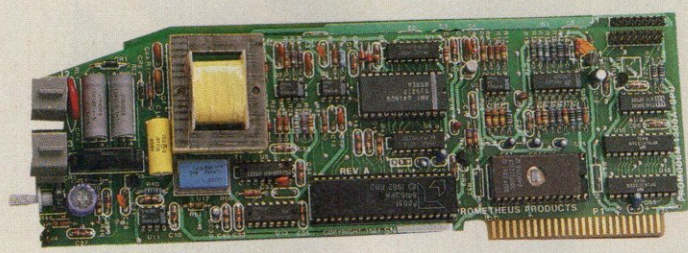
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```
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```

```
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2) FILE TRANSFER
3) OPTIONS
            USE ESC TO EXIT
            ENTER SELECTION
```

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

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

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

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The second part of a four-part tutorial on using the language of the LaserWriter printer

Shaping POSTSCRIPT To Your Bidding

PostScript, the language built into the Apple LaserWriter printer, has a rich vocabulary for graphics as well as for text. In this second part of the *A+* series on working with PostScript, I'll present some of the simple graphics operations you can do by using an Apple II, Macintosh, or any other computer with a serial port to send PostScript commands to the LaserWriter.

If you caught last month's installment, you'll remember that although you don't have to know anything about the PostScript language to use ordinary software packages with the LaserWriter, learning PostScript can give you better control over printed pages, help you write your own software programs, and provide an interesting peek into another kind of programming.

That's especially true for graphics on the LaserWriter. With a little bit of extra effort and some simple programs, you can turn a LaserWriter into a sketch pad capable of a much finer resolution than a video screen.

PostScript's Graphics Environment

To begin, let's review the PostScript graphics environment. Using a collection of saved values called the current graphics state for the defaults, PostScript creates on a page an image that depends on your commands. Those graphics commands, like all other PostScript commands, are written in postfix form, with the operators following the values they work on.

PostScript can give you better control over printed pages, help you write your own software programs, and provide an interesting peek into another kind of programming.

In the examples that follow, lines that start with the percent sign are program comments. Because of the narrow column widths, I've generally put the comments first, then the command lines they explain. See last month's installment for directions on how to start up the LaserWriter and enter PostScript programs.

Saving the Current State

The first operation in most PostScript graphics routines is to save the current graphics state. This operation allows us to change the state as we please without worrying about losing the standard values other routines might need. When we're done, we restore the original graphics state. The first and last operational lines of our program, then, are commonly

```
% save the graphics state
gsave
% restore the saved state
grestore
```

Further on, we'll change some of the graphics-state values, but right now it's time to consider the blank page we have to work with. The PostScript page is a two-dimensional space with the origin

(0,0) point at the bottom left, and a default scale of 72 units to the inch. If you want to switch the drawing point to two inches over and four up, for example, you write

```
144 288 moveto
```

On the LaserWriter, the page is assumed all white unless you have a mark placed on it.

The most common way to make graphic designs on a PostScript page is to create a "path" of connected lines or curves, which you can then make visible, fill, replicate, or use as a template. To create a simple drawing of a house, for example, we might in turn create paths representing the walls, doors, windows, and roof. We tell PostScript when we want to start a path with newpath . Our sequence thus far becomes

```
gsave
144 288 moveto
newpath
grestore
```

If we were to add showpage at this point, we'd still get a blank page. Moving to a position or defining a path doesn't actually draw the image. To actually draw the image, we create a path and either use stroke (to follow the outline of the path, much like inking in a drawing) or the Fill command (to color in any area completely enclosed by the current path).

We now have all the elements to draw a small bar across the paper. Write

```
% save the state
% set up a path
% move to the initial position
gsave
newpath
144 288 moveto

% draw a line
% ink it in
% output the page

288 288 lineto
stroke
showpage
grestore
```

Now let's expand that a bit to make the program draw a simple box and color it black. We'll tell it exactly where to move for the first point on the box, specify relative movements for three of the sides, and simply tell PostScript to close up the path to make the fourth side. When we have the completed outline, we'll tell PostScript to fill in the square.

```
% set up a path
% set initial position
gsave
newpath
288 288 moveto

% move up, over, down
% complete path
% fill it in
0 144 rlineto
144 0 rlineto
0 -144 rlineto
closepath
fill

% print out
showpage
grestore
```

Notice that we didn't say explicitly what to fill the box with. PostScript specifies that the fill operator gets the fill color or pattern from the current graphics state, and on the LaserWriter the initial default fill pattern is black.

Let's see if we can add a round peg to our square hole. PostScript uses simple arcs and more complex Bezier curves (a class of curves connecting four points). We'll stick with the arcs. To make a circle, we start a new path, specify the origin point, give the radius, and finish with the starting and ending angles. A one-inch circle in the middle of a standard page becomes

```
% save
% create a path
% specify the arc
% ink it in
gsave
newpath
288 360 72 0 360 arc
stroke

% show page, restore
showpage
grestore
```

To make this an outline, we follow the arc command with stroke; to make the circle solid, we follow it with fill.

We don't have to choose just a white interior or a solid black fill. By setting the color parameter in the graphics state, we can choose any gradation in between. To set a middle-darkness gray, for example, before executing a fill we write

```
0.5 setgray
```

Although in the narrow context it may seem counterintuitive that leaving the image white requires a color value of 1 and filling with black needs a 0, if you remember that PostScript is a gen-

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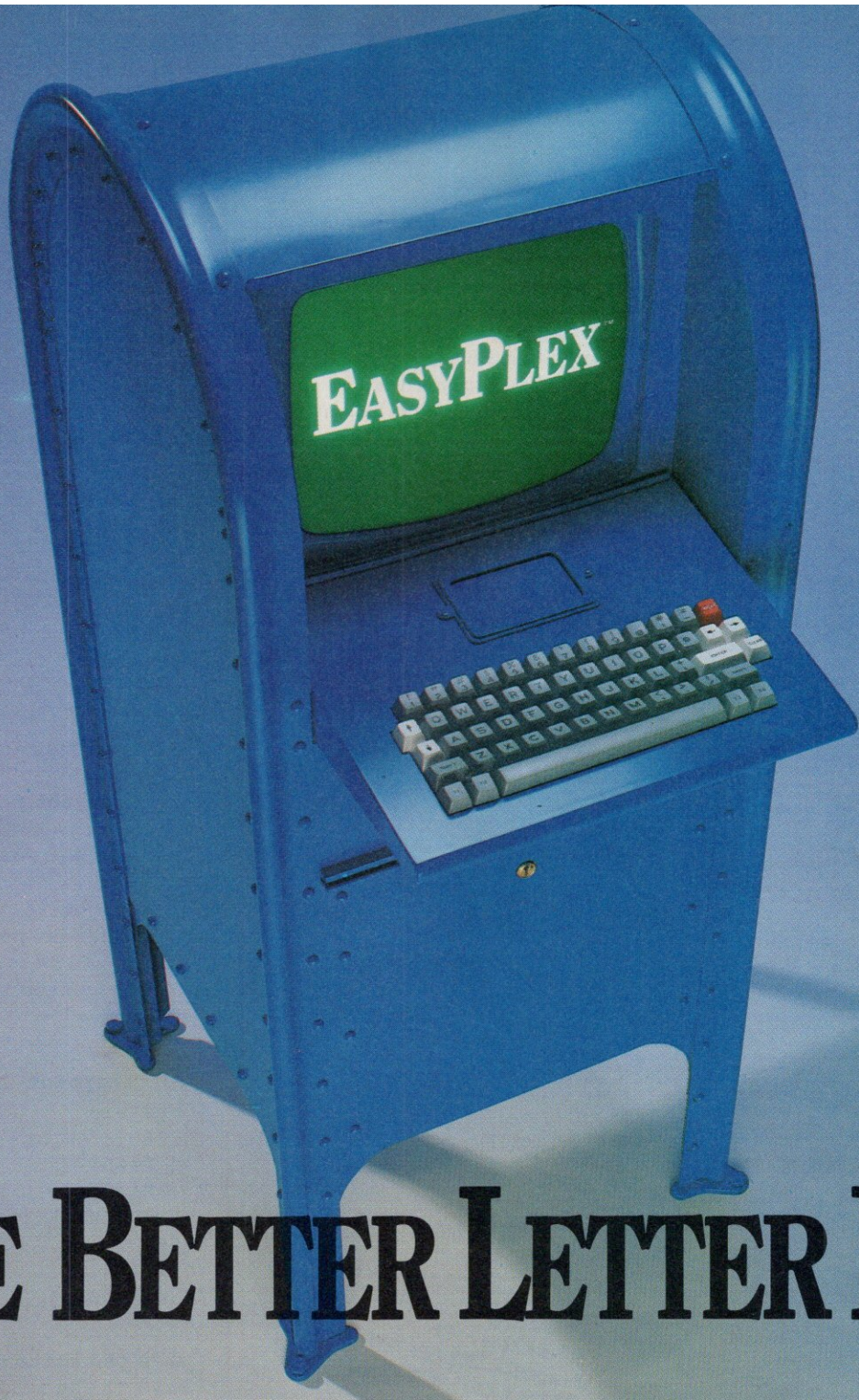
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eral solution that is also designed for working with color printers, having more brightness carry the higher value makes more sense. PostScript has still other commands for setting hues (color tones), but naturally they don't do much good on the one-color LaserWriter.

If we want to outline our arc rather than fill it, we also have a wide variety of choices for the stroke pattern and size. In much the way we can set the brush shape and pattern in MacPaint or MousePaint, we can set the stroke width and the shape of the corners. Stroke width is another value saved in the graphics state, but we can change it with setlinewidth . For example,

```
5 setlinewidth
```

says to set the width to five units wide. The units start out as points, but we can change them and even make the vertical and horizontal units different. We'll have to pass on the whole topic of user coordinate systems, so check the PostScript manual if you want to find out how to make lines that look as if they came from an italic-nib drawing pen.

Line endings and corners are set by the linecap and linejoint parameters, also part of the graphics state. We'll draw a few examples in a moment, but here are the possibilities.

Line caps (the ends of lines) can be butt (ending right at the end of the stroke), rounded (semicircles centered at the end of the stroke), or projecting square (boxed with centers at the end of the stroke). Similarly, line joins can be mitered (extended until they meet), rounded (circular with center at intersection), or beveled (flattened connections).

Let's make a series of three half-boxes, each with a different stroke width, line cap, and join. Because we're going to make three identical figures, we'll use PostScript's ability to define a word by pushing a name and deferred procedure onto the stack, followed by the def operator to define the name we specified as invoking the procedure.

```
% define a procedure to draw a
% half box
% save current position
% start a new path
% get current position from the
% stack
% move right 1", up 1"
% save current position
% ink in the result, get current
% position from the stack, then
% move over 1"

/halfbox
{ currentpoint
newpath
moveto
72 0 rlineto
0 72 rlineto
currentpoint
stroke
moveto
72 0 rlineto}
def

% save the state
% move to the initial position

gsave
144 144 moveto

% set butt caps and mitered
% joins
% set two unit line width
% invoke the procedure

0 setlinecap
0 setlinejoin
2 setlinewidth
halfbox

% set rounded caps and rounded
% joins
% set five-unit line width
```


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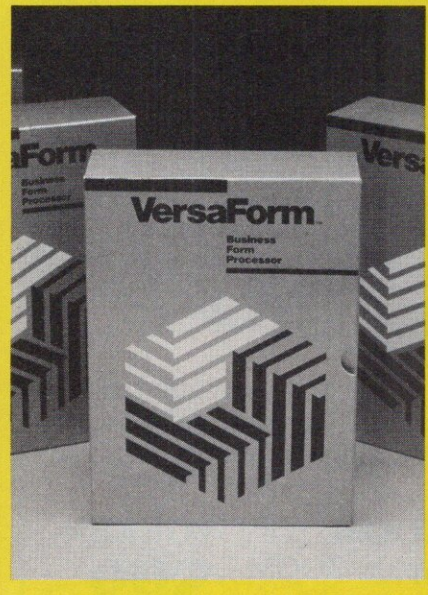
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Figure 1: A series of half boxes demonstrating PostScript's ability to define a procedure and use commands to draw varying line widths, caps, and joins

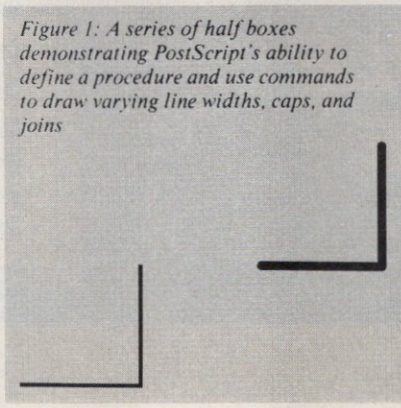
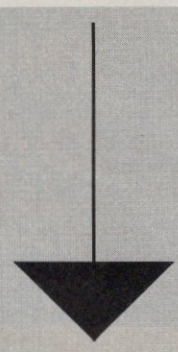


Figure 2: A filled arrowhead and automatically-centering text drawn from PostScript on the LaserWriter printer




```
% invoke the procedure

1 setlinecap
1 setlinejoin
5 setlinewidth
halfbox

% set projecting caps
% and beveled joints
% set ten-unit line width
% invoke the procedure

2 setlinecap
2 setlinejoin
10 setlinewidth
halfbox

% print the result,
% reset the state

showpage
grestore
```

The result should look like figure 1, above. You may not have much call for that particular graphic, but it does illustrate the way PostScript handles simple lines.

For our last example, we'll draw an arrow, followed by a closing message. Write

```
% because we're including text
% we need to set a font (see last
% month for details on fonts)

gsave
/Times-Roman findfont
12 scalefont
setfont

% mark the start of the figure
% and start at the middle of the
% page

newpath
288 500 moveto

% draw a vertical two-inch line
% with no change in horizontal
% position
% and save the current point
0 -144 rlineto
stroke/currentpoint

% make the triangular head by
% moving a half inch up and
% left, an inch right, and then
% closing the path. Save the
% current point. Fill in the
% result and restore the current
% position from the stack
newpath
moveto
36 36 rlineto
-72 0 rlineto
36 -36 rlineto
closepath
currentpoint
fill
moveto

% put our text in, make a copy
(That's all, folks) dup

% find the width, throw out
% the height, divide the result
% by 2, and make it negative

stringwidth pop 2 div neg

% set -18 points for vertical

-18 rmoveto

% now show our string, which
% should be on top of stack

show

% finally, we print the page
% and restore the state
showpage
grestore
```

The result is shown as figure 2.

If you have trouble following that last part, you might want to try writing it down step-by-step while making a diagram of what's on the stack.

Next month, in the third installment, we'll return to text operations. The fourth and final month will cover how PostScript is used in application programs. See you then. +

Steve Rosenthal first set letterpress type, which seemed conceptually simpler but was not nearly as flexible. It also got his hands a lot dirtier. He's currently an A+ consulting editor.

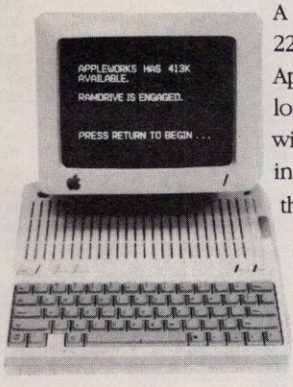
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UNDERSTANDING ProDOS

PART THREE OF A CONTINUING TUTORIAL ON THE NEW OPERATING SYSTEM PROGRAM FOR THE APPLE II FAMILY. THIS MONTH WE FINISH UP THE DISCUSSION OF COMMANDS BY DESCRIBING ALL THE OTHER STANDARD DISK COMMANDS AND THEN SHOWING YOU HOW TO INSTALL COMMANDS OF YOUR OWN.

This article is the third in a five-part series about how to use ProDOS. Last month, we looked at some of the Applesoft disk commands whose definitions are in a ProDOS interpreter file (also called a system program) named BASIC.SYSTEM. This month, we'll finish up the discussion of commands by describing all the other standard disk commands and then showing you how to install commands of your own creation.

The syntax of each of the Applesoft disk commands that we'll be discussing below is shown in figure 1 on the following page. Unlike the commands we reviewed last month, most of these commands will never be of use to nonprogrammers, since the majority are for use only within programs—you cannot type them in from the keyboard in the Applesoft Command mode.

This month's commands fall into two distinct groups: file input/output (I/O) commands and miscellaneous commands. Let's look at the former group first.

File I/O Commands

You use this group of commands to perform the fundamental disk Input/Output operations that are common to most operating systems: preparing a file for I/O operations (OPEN), reading data from a file (READ), writing data to a file (WRITE), and closing a file after all I/O operations have been performed (CLOSE). In addition, BASIC.SYSTEM defines commands that let you direct subsequent output to the end of a file (APPEND) or access any location within a file (POSITION).

Another command enables you to guard against data loss by saving the contents of a file's data buffer to disk earlier than they otherwise would be (FLUSH).

Before you can begin reading from or writing to a disk file, you must use the OPEN command to request access to the file. (The one exception, as we will see below, is that the APPEND command automatically opens a file that is not yet open.)

BASIC.SYSTEM opens a file by first locating it on the disk and then setting up a 1024-byte (1K) file buffer for it in memory. Half of this buffer holds information that tells BASIC.SYSTEM where the file data is located on the disk, and the other half holds the most recently accessed portion of the file.

Whenever you request a read or write operation, BASIC.SYSTEM determines whether the portion of the file to be accessed is already sitting in the buffer. If it is, BASIC.SYSTEM does not need, nor does it bother, to access that portion of the file from the disk. Instead, it simply stores the data in the buffer (a write operation) or reads the data from the buffer (a read operation). Thus, it performs file operations much more quickly than if it used unbuffered disk I/O techniques.

BASIC.SYSTEM initializes two important internal pointers, EOF and MARK, when you open a file. These pointers allow it to keep track of the size of the file and the position in the file that is currently being accessed. EOF is the end-of-file pointer, and it points to the byte following the last byte in the file. MARK is the position-in-the-file pointer; it contains the value of the position at which the next read or write operation will take place. Its setting is 0 (the beginning of the file) when you first open the file, but, as we will see below, it automatically increases as information is read from or written to the file.

You usually use OPEN to open a TXT (text) file. (You can use the ,Ttype parameter to deal with any other ProDOS file type.) This is how to open a text file with the pathname /A.PLUS/JULY in an Applesoft program:

```
100 PRINT CHR$ (4);
"OPEN /A.PLUS/JULY"
```

This line illustrates the standard way to use disk commands in an Applesoft program. You use the PRINT statement to print CHR$(4)—the Control-D code that BASIC.SYSTEM uses to identify its commands—followed, in quotation marks, by the name of the command and its parameters.

If the specified pathname does not exist, a new file entry will automatically be created in the active directory.

You can open files in one of two basic modes: sequential or random-access. A sequential file is one in which the data is stored in a continuous block. If you want to retrieve information from such a file, the computer usually first has to read all the data. If the file is a text file, the block comprises a series of lines of readable text, called fields, each of which is followed by a carriage-return

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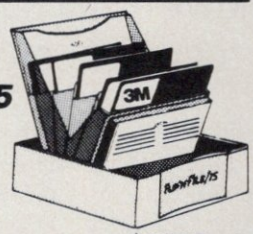
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Commands	Syntax
APPEND	pathname (,Ttype) (,L#) (,S#) (,D#)
BYE	
CHAIN	pathname (,@#) (,S#) (,D#)
CLOSE	(pathname)
FLUSH	(pathname)
FRE	
NOMON	
OPEN	pathname (,L#) (,Ttype) (,S#) (,D#)
POSITION	pathname ,F# or ,R#
READ	pathname (,R#) (,F#) (,B#)
RESTORE	pathname (,S#) (,D#)
STORE	pathname (,S#) (,D#)
WRITE	pathname (,R#) (,F#) (,B#)

Figure 1: The Applesoft disk commands described in this article—brackets enclose optional parameters.

code (usually $OD, but sometimes $8D). To open a sequential file, simply leave off the ,L# parameter when first opening the file.

A random-access file is one whose organizing principle is a series of fixed-length records that hold related groups of information. Your program can access any record randomly (i.e., without reading all previous records first), simply by specifying its record number when using the READ command (see below). To set the length of the record for a file, use the ,L# parameter when you first create the file with the OPEN command. (Recall from last month that # represents a decimal or hexadecimal number.) For example, to open a text file called NAMES with a record length of 128 bytes, you use the statement:

```
100 PRINT CHR$ (4); "Open Names,L128"
```

The record length you specify in the OPEN command when you first create a text file is displayed in the Subtype column of a CATALOG listing in the form R=$xxxx. In the above example, the subtype entry would read R=$0080, since $80 is the hexadecimal equivalent of 128.

READ

This command is for directing subsequent requests for input (using the Applesoft INPUT or GET command) to an open file instead of the keyboard. If you're accessing a random-access file, you can set the record number to be read with the ,R# parameter. For example, to begin reading from the fifth record of our NAMES file, you use this statement:

```
200 PRINT CHR$ (4); "READ NAMES,R4"
```

This statement sets the MARK position to the start of record 4. (Since the lowest record number is 0, not 1, record 4 is the fifth record.) When the computer reads information from the file, the MARK value automatically increases by the number of bytes read.

You can use two other parameters with the READ command to advance MARK to any position within a record: a field number (,F#) and/or a byte number (,B#). As with the record number, these numbers start with 0, not 1.

If you use more than one of the three-letter parameters (,R# or ,F# or ,B#), READ will first skip to the proper record number, then to the beginning of the proper field, and finally to the proper byte position within that field.

WRITE

You use this command to direct subsequent requests for output (using the Applesoft PRINT command) to an

open file instead of the video screen. It works much like the READ command does, except that information is saved to a file rather than read from a file.

APPEND

This command causes two actions: first, it opens a file, and, second, it directs subsequent output to the end of the file by setting MARK equal to EOF. The default file type APPEND uses is a TXT (text) file, but you can change it with the ,Ttype parameter.

Note that if you use APPEND with a random-access text file and specify a ,L# parameter that is the same as the file's record length, MARK is actually set equal to the beginning of the record immediately following the last record in the file.

POSITION

This command lets you skip over a specified number of fields in a file. The number of fields is determined by the value of the ,F# or ,R# parameters (they are equivalent). After you issue a POSITION command, the MARK pointer is set to the byte following the carriage-return code in the last skipped field, and subsequent read or write operations will take place at this position after you specify another READ or WRITE command.

FLUSH

The FLUSH command forces any data in the file buffer to be saved to disk, even if the buffer is not yet full. This command minimizes the risk of data loss in the event of an unexpected exit from the program (due to a loss of power, pressing Reset, or the like), but it slows down disk write operations considerably. If you use FLUSH without a pathname, the buffers for all open files will be flushed.

CLOSE

With this command, you can close a file that you've opened with the OPEN or APPEND command. When a file is closed, its buffer is automatically flushed, and its new size is stored in the directory. If you use CLOSE without a pathname, all open files will be closed.

Although you don't have to close a file immediately after you finish with it (you could wait until the program is about to end), it makes sense to do so in order to reduce the risk of data loss that would occur in the event of a power loss or system reset. In addition, BASIC.SYSTEM allows only eight files to be open simultaneously, so if you have a lot of inactive, but open, files lingering around, you may face a surprising error message the next time you open a file. Another reason for closing unused files is to free up the 1K buffer space an open file uses.

MISCELLANEOUS COMMANDS

The remaining Applesoft disk commands do not fall neatly into any specific category, so we'll lump them together and call them miscellaneous commands. Let's get right to them.

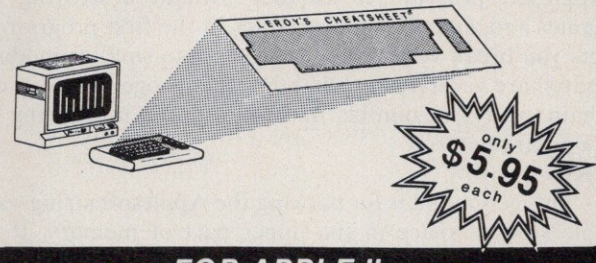
BYE

This command lets you transfer control from BASIC.SYSTEM to another ProDOS system program. A system program is one that takes over the entire system (except the lowest-level ProDOS subroutines) to perform a specific chore, such as defining a programming environment or performing a particular function. Examples of system programs are the FILER and CONVERT utilities (you can find them on the ProDOS users' diskette) and the AppleWorks integrated-software system.

When you enter BYE, ProDOS first asks you to enter the prefix and then the pathname of the next application to be run—it must be a ProDOS system program.

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CHAIN

You use this command to transfer control from one Applesoft program to another without destroying the names and values of the variables in the first program. It lets you break very large programs into smaller modules that share variables by chaining them together. You can chain to any line number in the new program by using the ,@# parameter.

FRE

This command is for packing the Applesoft string-variable storage space in the upper part of memory. It removes former string definitions from the space and moves the active strings together into a continuous block. This procedure is called garbage collection or, more euphemistically, housecleaning and works much more quickly than the Applesoft command of the same name.

STORE

This command lets you save the names and values of all the variables in an Applesoft program to a file. The mnemonic for the file-type code assigned to the file is VAR.

RESTORE

This command is used to set the names and values of the variables in an Applesoft program equal to those contained in a specified file. This file must be of the type VAR (the type the STORE command creates).

NOMON

BASIC.SYSTEM accepts this command, but it does nothing. Apple included it in the command set for DOS 3.3-compatibility reasons. The DOS 3.3 version disables the display of disk commands and input/output operations, but under BASIC.SYSTEM they are always disabled, anyway.

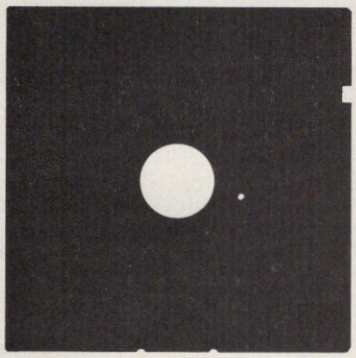
USER-DEFINABLE EXTERNAL COMMANDS

We have now looked at all 32 disk commands BASIC.SYSTEM defines, but we're not through yet. One of the most useful features of BASIC.SYSTEM is that you can extend its command set by installing user-defined external commands that perform a myraid of other useful functions. Unfortunately, to write the code to support such commands, you must master the art of 6502 assembly-language programming. On the other hand, if someone does the writing for you, all you have to know is how to install and use the external commands.

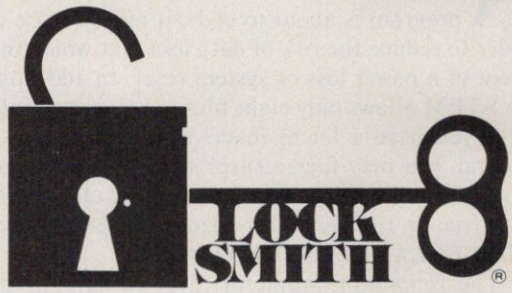
When BASIC.SYSTEM encounters a command it doesn't recognize, it does not immediately display an error message; it calls a three-byte jump instruction at EXTRNCMD ($BE06) to see if the command is claimed by a user-installed external-command handler (the handler's address is stored at $BE07 and $BE08). If no external-command handler has been installed, EXTRNCMD will jump to a "do-nothing" RTS ("return from subroutine") instruction at XRETURN ($BE9E).

If the external-command handler does not claim the command, and if command entry was from within a program, you'll get a BASIC.SYSTEM syntax-error message. If, on the other hand, the command was entered in the Applesoft Command mode, it will pass on for consideration by the Applesoft ROM interpreter; only if the interpreter does not recognize it will an Applesoft syntax-error message appear.

Suppose that a properly designed external-command handler has been installed, so that a call to EXTRNCMD will pass control to it. This handler first executes the CLD



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Location	Symbolic Name	
$BE58–$BE59	APARM	A (address) parameter
$BE5A–$BE5C	BPARM	B (byte #) parameter
$BE5D–$BE5E	EPARM	E (end addr) parameter
$BE5F–$BE60	LPARM	L (length) parameter
$BE61	SPARM	S (slot) parameter
$BE62	DPARM	D (drive) parameter
$BE63–$BE64	FPARM	F (field #) parameter
$BE65–$BE66	RPARM	R (record #) parameter
$BE68–$BE69	@PARM	@ (line #) parameter
$BE6A	TPARM	T (file type code) parm
$BE6B	SLPARM	"snum" parameter
$BE6C–$BE6D	PATH1	pointer to 1st pathname
$BE6E–$BE6F	PATH2	pointer to 2nd pathname

Figure 2: BASIC.SYSTEM parameter table—the BASIC.SYSTEM parser stores the value of a specified parameter in this table.

("clear decimal flag") instruction that future versions of BASIC.SYSTEM will use as an identification byte. The handler then determines whether this command has, in fact, been entered; it can do so by checking to see if the first few characters in the command line match the expected command string. (The command line is stored in Apple's standard input buffer, beginning at $200, in ASCII-encoded form, with the high bit of each code set to 1.) If they don't, the subroutine must end with the 6502 carry flag set to indicate that the command was not claimed.

If the external-command handler detects the correct command, it can ask BASIC.SYSTEM to parse parameters from the command line and do syntax checking. It makes this request by setting certain bits in PBITS ($BE54) and PBITS+1 ($BE55).

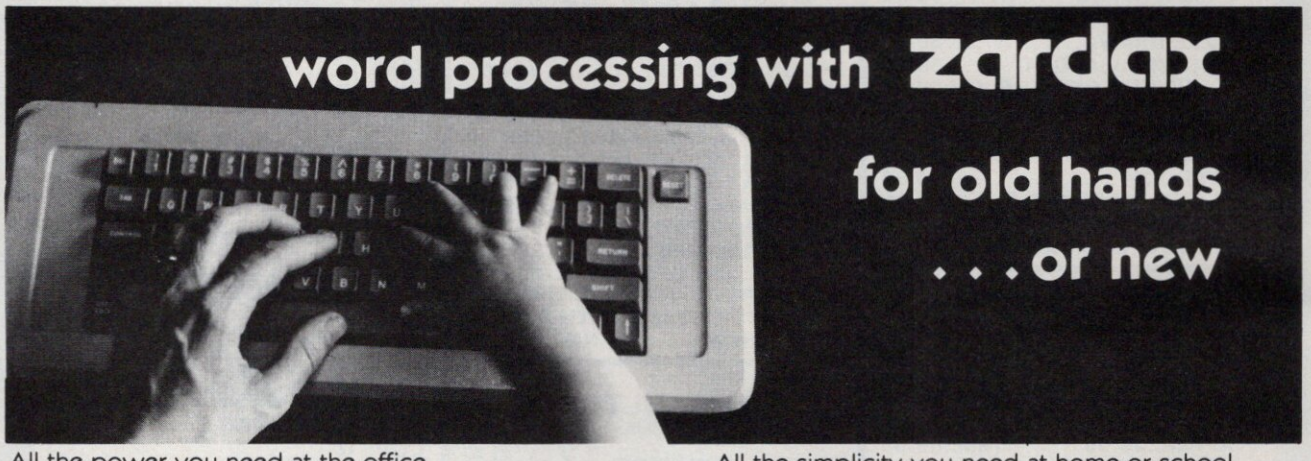
With three exceptions, the handler uses each bit in PBITS and PBITS+1 as a flag to indicate whether the particular parameter associated with that bit is required or allowed. The exceptions are bits indicating particular characteristics of the command: whether a prefix must be fetched for it, whether it is valid in the Applesoft Command mode, and whether a specified file should be created if it doesn't already exist. The meaning of each bit is as follows:

PBITS ($BE54)

bit 7 Fetch the current prefix if a pathname is not specified.
bit 6 A slot number is required (e.g., IN#, PR#).
bit 5 The command is not valid in the Applesoft Command mode.
bit 4 A pathname is optional.
bit 3 Create a file if the specified one does not exist.
bit 2 The T parameter is allowed.
bit 1 A second pathname is required (e.g., RENAME).
bit 0 A pathname is allowed. If the external-command handler sets the S and D bit of PBITS+1 to 1, a pathname is required.

PBITS+1 ($BE55)

bit 7 The A parameter is allowed.
bit 6 The B parameter is allowed.
bit 5 The E parameter is allowed.
bit 4 The L parameter is allowed.
bit 3 The @ parameter is allowed.
bit 2 The S and D parameters are allowed.
bit 1 The F parameter is allowed.
bit 0 The R parameter is allowed.



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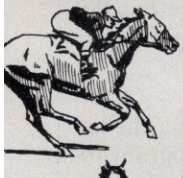
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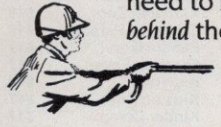


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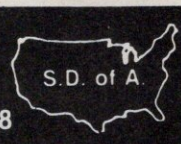
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CIRCLE 155 ON READER SERVICE CARD

The descriptions of PBITS and PBITS+1 apply when the corresponding bit is set to 1. For example, if the command allows a pathname and A and E parameters, the handler will set PBITS to $01 and PBITS+1 to $A0. If a pathname is actually mandatory, bit 2 of PBITS+1 (the S and D bit) must be set to 1 as well. If BASIC.SYSTEM is not to do any parsing, PBITS must be set to 0.

After the handler sets up PBITS and PBITS+1, it stores the length of the command string minus 1 in XLEN ($BE52), stores 0 (the code number for an external command) in XCNUM ($BE53), and then stores at XTRNADDR ($BE50/$BE51) the address to which control is to pass after BASIC.SYSTEM parses the command line. The latter step must occur even if the handler has indicated that no parsing is necessary. Last, the handler must clear the carry flag before returning control to BASIC.SYSTEM.

When BASIC.SYSTEM regains control, the parameters in the command line are parsed in accordance with the encoded instructions stored in PBITS and PBITS+1. The values of the parameters that are actually parsed from the line are stored in a parameter table located at $BE58–$BE6F (see figure 2). If the handler does not detect a particular parameter during the parsing operation, the parameter's entry in the table stays as it was before the external command was executed. The actual parameters that were successfully parsed are indicated by the presence of "1" bits in FBITS ($BE56) and FBITS+1 ($BE57). The meaning of each bit in FBITS and FBITS+1 is the same as that of the corresponding bit in PBITS and PBITS+1.

After a successful parse, BASIC.SYSTEM jumps to the second half of the external-command handler, the subroutine whose address is stored at XTRNADDR ($BE50/$BE51). This subroutine can actually execute the command (if it wasn't already executed in the first half) and then return to BASIC.SYSTEM with the accumulator zeroed and the carry flag clear if there was no error.

If the handler detects an error, it then can be passed to BASIC.SYSTEM for handling by setting the carry flag and placing the appropriate error code in the accumulator. See Apple's *BASIC Programming with ProDOS* or my *Apple ProDOS, Advanced Features for Programmers* for a list of these error codes. Alternatively, the command handler can deal with the error itself; if it does, the handler must clear the carry flag and zero the accumulator before returning to BASIC.SYSTEM.

A SAMPLE PROGRAM

Confused? Let's clear things up by examining the assembly-language program in figure 3. This program installs the handler for a command called DUMP# that you can use to send the contents of the 40- or 80-column video screen of the Apple IIe or IIc to a printer. (If you don't know how to deal with assembly-language programs, you can run the Applesoft program in figure 4 to install the DUMP# command.) You invoke the command by entering DUMP# snum from the Applesoft command mode (where snum represents the slot number of the printer) or by executing an Applesoft statement of this form:

```
100 PRINT CHR$ (4); "DUMP #snum"
```

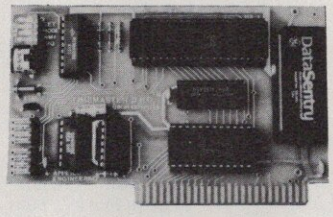
The first part of the program simply installs the new command handler by moving the current target address of the EXTRNCMD jump instruction to DAISY and DAISY+1 and replacing it with the address of CMDCODE. If

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CIRCLE 137 ON READER SERVICE CARD

Figure 3: The assembly-language program that defines and installs the DUMP# command.

```
                        ********************************
                        *  BASIC.SYSTEM "DUMP#" command  *
                        *                                *
                        *         DUMP# snum             *
                        *                                *
                        * snum = printer slot # (0..7)   *
                        *                                *
                        * Copyright 1985 Gary B. Little *
                        ********************************

                BASL    EQU   $28       ;Line base address pointer

                CSW     EQU   $36       ;Output link
                IN      EQU   $200      ;Command input buffer

                EXTRNCMD EQU  $BE06     ;External command JMP instr
                XTRNADDR EQU  $BE50     ;Start of external cmd handler
                XLEN    EQU   $BE52     ;External cmd name length (-1)
                XCNUM   EQU   $BE53     ;Command # (0 for external)
                PBITS   EQU   $BE54     ;Command parameter bits
                SLPARM  EQU   $BE6B     ;"snum" parameter value

                COL80   EQU   $C01F     ;bit 7=1 if 80-columns on
                MAINRAM EQU   $C054     ;Select main video page
                AUXRAM  EQU   $C055     ;Select auxiliary video page

                IDBYTE  EQU   $FBB3     ;ID: 6=Apple //e, //c
                BASCALC EQU   $FBC1     ;Calculate screen base address
                CROUT   EQU   $FD8E     ;Print a CR
                COUT    EQU   $FDED     ;Std. character output sub.
                OUTPORT EQU   $FE95     ;Monitor "PR#" command

                        ORG   $2E9

                * Install the new command handler:

02E9: AD 07 BE          LDA   EXTRNCMD+1 ;Set up daisy chain to
02EC: 8D B1 03          STA   DAISY      ; existing external command.
02EF: AD 08 BE          LDA   EXTRNCMD+2
02F2: 8D B2 03          STA   DAISY+1

02F5: A9 00             LDA   #<CMDCODE  ;Install the external command
02F7: 8D 07 BE          STA   EXTRNCMD+1 ; handler by storing its addr
02FA: A9 03             LDA   #>CMDCODE  ; after the JMP at EXTRNCMD.
02FC: 8D 08 BE          STA   EXTRNCMD+2

02FF: 60                RTS

                ********************************
                * Check for presence of command. *
                ********************************
0300: D8        CMDCODE CLD             ;Identification byte
0301: A0 00             LDY   #0
0303: A2 00             LDX   #0
0305: BD 00 02  CHKCMD  LDA   IN,X      ;Get command character
0308: E8                INX
0309: C9 A0             CMP   #$A0      ;Is it a blank?
030B: F0 F8             BEQ   CHKCMD    ;If it is, ignore it
030D: D9 B9 03          CMP   CMDNAME,Y ;Same as our command?
0310: F0 0B             BEQ   CHKCMD1   ;Yes, so branch
0312: C9 E0             CMP   #$E0      ;Lower case?
0314: 90 0E             BCC   NOTFOUND  ;No, so branch
0316: 29 DF             AND   #$DF      ;Convert to uppercase
0318: D9 B9 03          CMP   CMDNAME,Y ;OK now?
031B: D0 07             BNE   NOTFOUND  ;No, so branch
031D: C8        CHKCMD1 INY
031E: C0 05             CPY   #CMDLEN-CMDNAME ;At end?
0320: D0 E3             BNE   CHKCMD    ;No, so branch
0322: F0 04             BEQ   SETRULES  ;Yes, so branch

0324: 38        NOTFOUND SEC            ;Set carry to indicate failure
0325: 6C B1 03          JMP   (DAISY)   ;Try next user command

0328: 88        SETRULES DEY
0329: 8C 52 BE          STY   XLEN      ;Store command length-1

032C: A9 47             LDA   #<EXECUTE ;Put address of command handler
032E: 8D 50 BE          STA   XTRNADDR  ; into XTRNADDR.
0331: A9 03             LDA   #>EXECUTE
0333: 8D 51 BE          STA   XTRNADDR+1

0336: A9 00             LDA   #0
0338: 8D 53 BE          STA   XCNUM     ;External cmd number = 0

033B: A9 40             LDA   #$40      ;"snum" mandatory
033D: 8D 54 BE          STA   PBITS
0340: A9 00             LDA   #0
0342: 8D 55 BE          STA   PBITS+1
```

```
0345: 18          90            CLC             ;Clear carry to indicate success
0346: 60          91            RTS
                  92
                  93    * BASIC.SYSTEM comes here after it has
                  94    * successfully parsed the command line:
                  95
0347: 08          96    EXECUTE PHP             ;Save interrupt status
0348: 78          97            SEI             ;Disable interrupts for this
                  98
0349: A5 36       99            LDA   CSW       ;Save current output hook
034B: 48          100           PHA             ; on the stack.
034C: A5 37       101           LDA   CSW+1
034E: 48          102           PHA
034F: A5 28       103           LDA   BASL      ;Save current base address
0351: 48          104           PHA
0352: A5 29       105           LDA   BASL+1
0354: 48          106           PHA
                  107
0355: AD 6B BE    108           LDA   SLPARM    ;Get printer slot #
0358: 20 95 FE    109           JSR   OUTPORT   ;Do a "PR# snum"
                  110
                  111   * Turn off screen echo:
                  112
035B: A2 00       113           LDX   #0
035D: BD B3 03    114   INITPRT LDA   NOECHO,X  ;Get printer byte
0360: F0 06       115           BEQ   DUMPSCR   ;Branch if done
0362: 20 ED FD    116           JSR   COUT      ;..else send to printer
0365: E8          117           INX             ;On to the next one
0366: D0 F5       118           BNE   INITPRT   ;(Always taken)
                  119
0368: A9 00       120   DUMPSCR LDA   #0
036A: 8D B8 03    121           STA   LINENUM   ;Start with line 0
                  122
036D: 20 C1 FB    123   GETBASE JSR   BASCALC   ;Get base address for line
                  124
0370: A0 00       125           LDY   #0
0372: 2C 1F C0    126   PRTLINE BIT   COL80     ;80-columns on?
0375: 10 12       127           BPL   PL1       ;No, so branch
0377: AD B3 FB    128           LDA   IDBYTE    ;Apple //e or //c?
037A: C9 06       129           CMP   #6
037C: D0 0B       130           BNE   PL1       ;No, so branch
037E: 8D 55 C0    131           STA   AUXRAM    ;Read even column
0381: B1 28       132           LDA   (BASL),Y  ;Get byte
0383: 8D 54 C0    133           STA   MAINRAM   ;Get ready for odd column
0386: 20 ED FD    134           JSR   COUT      ;Print even column
0389: B1 28       135   PL1     LDA   (BASL),Y
038B: 20 ED FD    136           JSR   COUT
038E: C8          137           INY
038F: C0 28       138           CPY   #40       ;At end of line?
0391: D0 DF       139           BNE   PRTLINE   ;No, so branch
                  140
0393: 20 8E FD    141           JSR   CROUT
                  142
0396: EE B8 03    143           INC   LINENUM   ;Move to next line
0399: AD B8 03    144           LDA   LINENUM
039C: C9 18       145           CMP   #24       ;Past the bottom?
039E: D0 CD       146           BNE   GETBASE   ;No, so branch
                  147
03A0: 68          148           PLA             ;Restore base address
03A1: 85 29       149           STA   BASL+1
03A3: 68          150           PLA
03A4: 85 28       151           STA   BASL
                  152
03A6: 68          153           PLA             ;Restore output hook
03A7: 85 37       154           STA   CSW+1     ; from the stack.
03A9: 68          155           PLA
03AA: 85 36       156           STA   CSW
                  157
03AC: 28          158           PLP             ;Restore interrupt status
                  159
03AD: 18          160           CLC             ;Clear error flag
03AE: A9 00       161           LDA   #0        ;Clear error code
03B0: 60          162           RTS
                  163
03B1: 00 00       164   DAISY   DA    $0000     ;Address of next cmd handler
                  165
                  166   ************************************
                  167   * Command to turn off screen echo. *
                  168   ************************************
03B3: 89          169   NOECHO  DFB   $89        ;CTRL-I
03B4: B8 B0 CE    170           ASC   "80N"
03B7: 00          171           DFB   0         ;(terminator)
                  172
03B8: 00          173   LINENUM DS    1
                  174
03B9: C4 D5 CD    175   CMDNAME ASC   "DUMP#" ;External command name
03BC: D0 A3
                  176   CMDLEN  EQU   *
```


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CIRCLE 148 ON READER SERVICE CARD

```
0     REM "DUMP#" INSTALLER
100   FOR I = 745 TO 957: READ X: POKE I,X: NEXT
200   CALL 745
300   END
1000  DATA 173,7,190,141,177,3,173,8,190,141,178,3,169,0,141,7,190,169,3,
      141,8,190,96,216,160,0,162,0,189,0
1001  DATA 2,232,201,160,240,248,217,185,3,240,11,201,224,144,14,41,223,
      217,185,3,208,7,200,192,5,208,227,240,4,56
1002  DATA 108,177,3,136,140,82,190,169,71,141,80,190,169,3,141,81,190,
      169,0,141,83,190,169,64,141,84,190,169,0,141
1003  DATA 85,190,24,96,8,120,165,54,72,165,55,72,165,40,72,165,41,72,173,
      107,190,32,149,254,162,0,189,179,3,240
1004  DATA 6,32,237,253,232,208,245,169,0,141,184,3,32,193,251,160,0,44,
      31,192,16,18,173,179,251,201,6,208,11,141
1005  DATA 85,192,177,40,141,84,192,32,237,253,177,40,32,237,253,200,192,
      40,208,223,32,142,253,238,184,3,173,184,3,201
1006  DATA 24,208,205,104,133,41,104,133,40,104,133,55,104,133,54,40,24,
      169,0,96,0,0,137,184,176,206,0,0,196,213
1007  DATA 205,208,163
```

Figure 4: The Applesoft program that installs the DUMP# command

it's not our handler's command, things have been arranged so that control will always daisy-chain down to the previously installed command handler.

When BASIC.SYSTEM comes across an unrecognizable command, it passes control to CMDCODE. The first thing CMDCODE does is check if the DUMP# character string is in the input buffer at $200. If it isn't, the carry flag is set to indicate that the command was not handled, and control passes through to the subroutine whose address is stored at DAISY.

If CMDCODE does detect DUMP#, control passes to SETRULES, where the value of the length (minus 1) of the command string is stored at XLEN ($BE52), the external-command number (0) is stored in XCNUM ($BE53), and the address of the part of the handler that is to be called after parsing (EXECUTE) is stored at XTRNADDR and XTRNADDR+1 ($BE50/$BE51). The command handler then stores the parsing rule ("snum is required") in PBITS and PBITS+1 ($BE54/$BE55) by setting bit 6 of PBITS to 1. Finally, the carry flag clears to indicate that the command was successfully detected and parsing should begin. When the BASIC.SYSTEM parser takes over, it checks to see whether "snum" was specified. If it wasn't, or if any other parameter was detected, an error will occur. Otherwise, the value of "snum" is stored at SLPARM ($BE6B), and the address of the subroutine stored at XTRNADDR (EXECUTE) is called.

EXECUTE contains the specific code necessary to send the characters on the screen to the printer, line by line. We won't get into the details of how it does this, since it really has nothing to do with ProDOS or BASIC.SYSTEM. The comments in the listing in figure 3 should clarify what is happening, however. You may also want to refer to books such as *Inside the Apple IIe*, *Inside the Apple IIc*, or Apple's reference manuals for descriptions of how the 40- and 80-column video screens are stored in memory.

After the screen has printed, the carry flag clears and the accumulator is zeroed to indicate that no error has occurred. Control then returns to BASIC.SYSTEM, and we're done!

Well, that does it for this month. Next time we'll take a close look at two system programs called FILER and CONVERT that you can use to perform various useful chores such as formatting disks, copying files, and transferring files between DOS 3.3 and ProDOS disks. ✚

Gary B. Little is a lawyer and author in Vancouver, British Columbia. He has written three books for programmers of the Apple II series: Inside the Apple IIe, Inside the Apple IIc, *and* Apple ProDOS, Advanced Features for Programmers *(1985, Brady Communications).*

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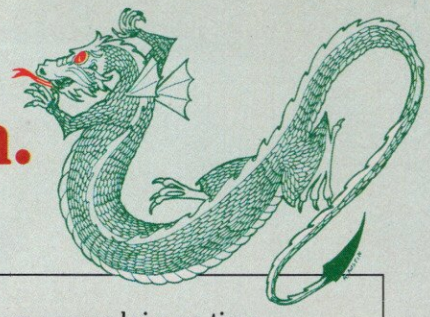
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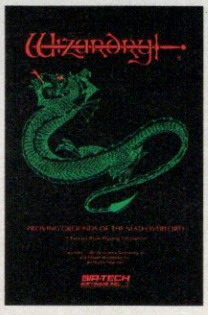
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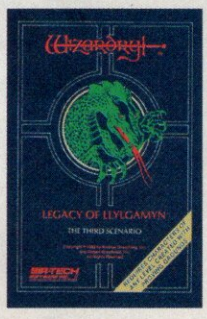


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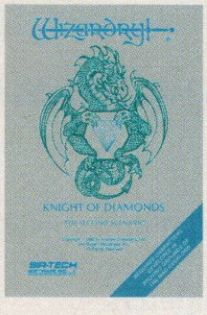


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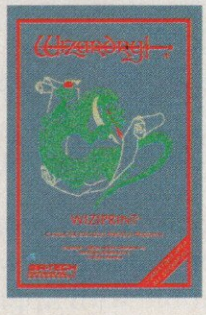


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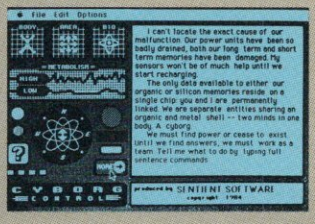
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CYBORG FOR THE MAC
KARATEKA
SOLO FLIGHT
USADVENTURE

THAT'S entertainment



You are at a T in the road. There is a tiny lizard in a spacesuit leaning on an even tinier crutch. He is crying 'Truth for food.'

SPLIT PERSONALITY

You awaken. The world around you is weird, surreal, sublime. You feel strange, changed, there is a murmuring in your head. You are not alone.

You start to remember. You volunteered . . . . The surgeons have changed you. You are now a Cyborg, a creature of metal and muscle, steel and sinew. You don't know where you are or what you're supposed to be doing, but curiosity and hunger dictate that you must move.

You are at a T in the road. There is a tiny lizard in a spacesuit leaning on an even tinier crutch. He is crying, "Truth for food."

You have neither food nor truth. You are on your own, in a way, but now you have a constant companion. Your new partner, the metal half of yourself, which has damaged memory chips. It is about as comfortable with you as you are with it. You will have to come to terms and a mutually acceptable vocabulary.

I don't know about you, but I've had Mondays like that.

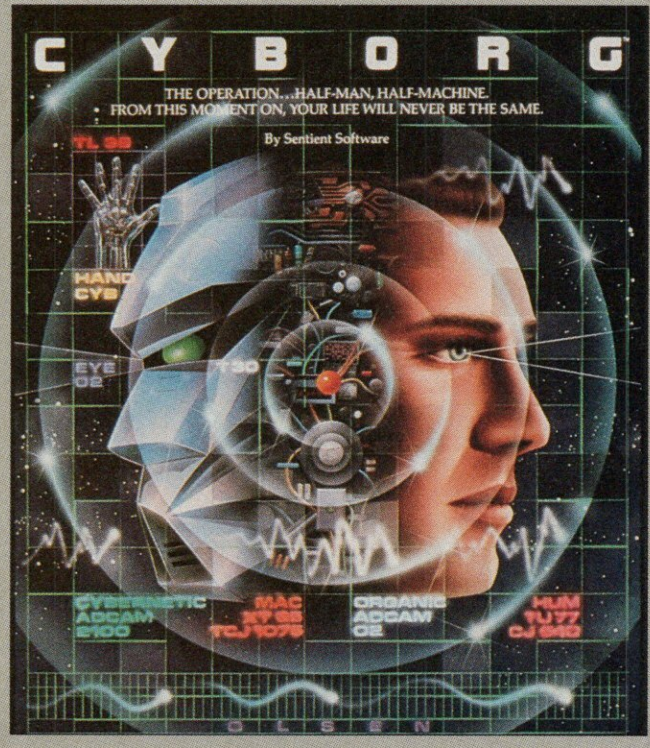
Welcome to the world of Cyborg, the adventure game by Sentient Software, published by Brøderbund Software. This is a true sci-fi/fantasy addict's game. Getting yourself dressed, armed, and permanently powered are only a few of the goals you must meet. There are worlds within worlds, intelligent two-headed snakes with three arms, and doors that defy Newtonian physics.

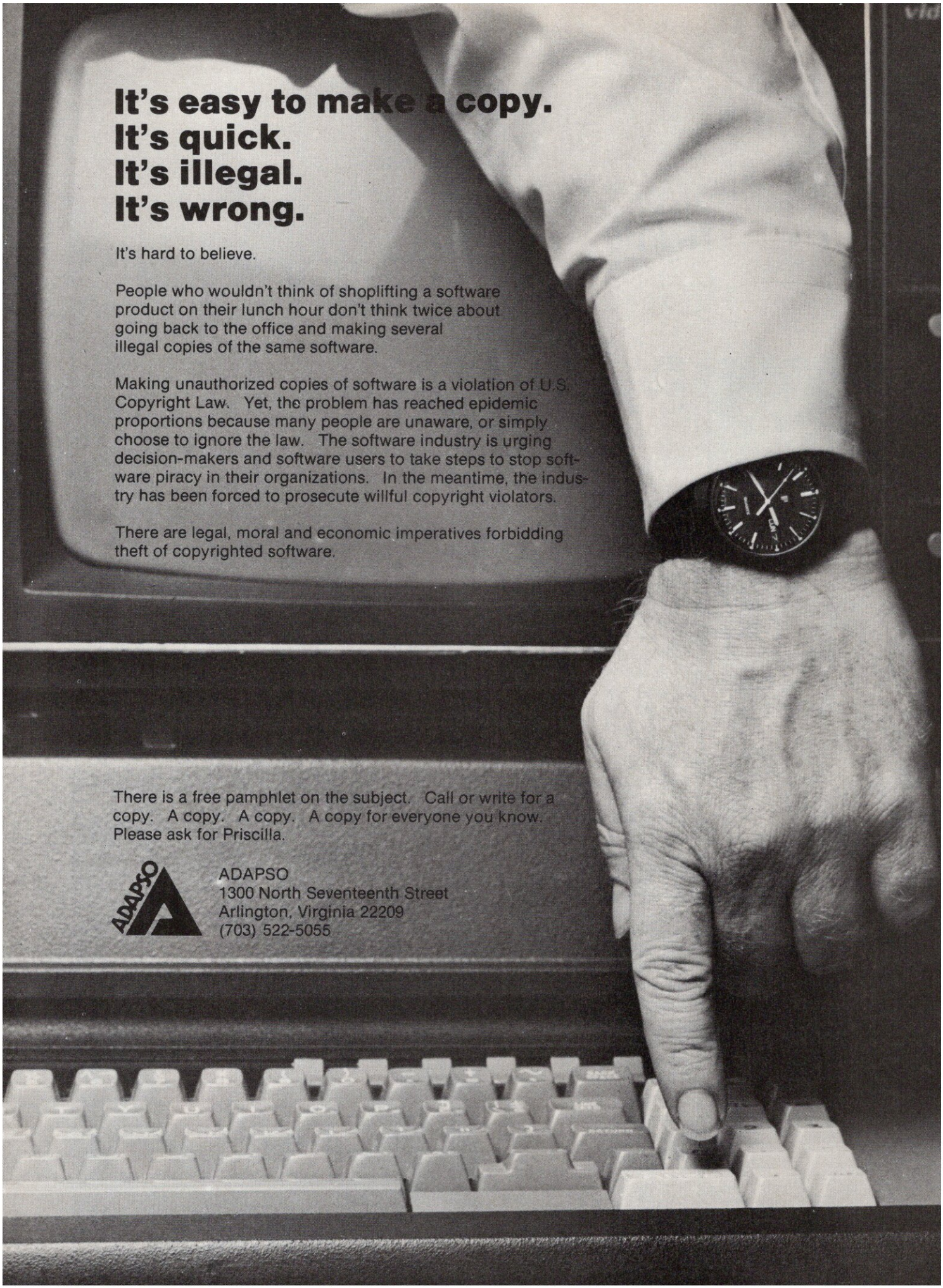
That's the first level.

Believe it or not, it's fun, and the internal logic of Cyborg invites its own form of madness. Or addiction. You must discover what your purpose is in order to figure out what you must accomplish to complete the adventure.

I haven't beaten the game yet, and have not actually met anyone (including the folks at Brøderbund) who has. Cyborg gets under your skin—when you're away from your machine, you find yourself discussing the finer points of laser power settings and lizard feeding. Strange, perhaps, but it beats soap operas by a wide margin.

The Macintosh version of Cyborg is easy to get around in. The screen is divided in half, the right portion dedicated to interactive dialogue with the environment and your Cyborg self. The left half of the screen is a hi-res control panel, a feature peculiar to the Brøderbund Mac edition of Cyborg. (Sentient Software, the creator of Cyborg, has released versions for




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Commodore, Atari, and the Apple II series under its own name. Because of the limitations of these machines, these versions are entirely text games.)

The control panel relieves you from the drudge typing that plagues most adventure games—it has a compass rose, for instance, that you can click on to move in any direction, including up and down. Icon-driven Scan functions allow you to survey your personal inventory, environment, and metabolism. You use a question mark to find out your computerized half's opinions on the area and objects you are holding or encounter.

A word to the wise: Your Cyborg self has a sense of humor, and though it won't lie to you, it does make mistakes. It also has a nasty habit of shutting itself off when you feel you need it most.

The control panel lets you save your key-pressing energy for more advanced activities such as taking and wearing stuff, shooting things, breaking down doors, and talking to trees (the trees do not answer, but in the world of Cyborg you can not ignore the possibility that they might).

The parser (the portion of the program that interprets English and drives the command structure of the game) is a little on the dim side. It recognizes about 800 words and has very strong feelings about what they mean. For example, it regards the difference between BREAK, OPEN, and CUT as large, and employing the wrong verb in the right place can lead you to a premature demise.

The game has no dictionary. According to the Brøderbund people, finding out the Cyborg's vocabulary is half the fun. I tend to agree, although I got clobbered several times trying to talk to myself.

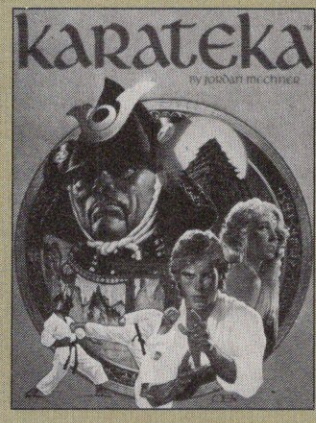
I really like this game. In a way, I dread the day when I actually master it. With any luck, Sentient will have come out with a new game by then.

Ken Goehner

Cyborg for the Mac
Sentient Software
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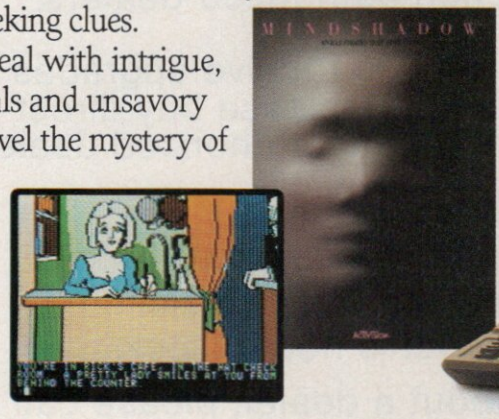
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CIRCLE 174 ON READER SERVICE CARD

THAT'S entertainment

Such is the story behind Karateka, a game of martial-arts action for the Bruce Lee in all of us. Brøderbund touts this game as a "suspenseful, movie-like story" with "realistic karate fighting" and

> Your beloved languishes in a dimly lit cell.

"smoothly animated characters." I can agree with the advertising, but only on a two-dimensional plane.

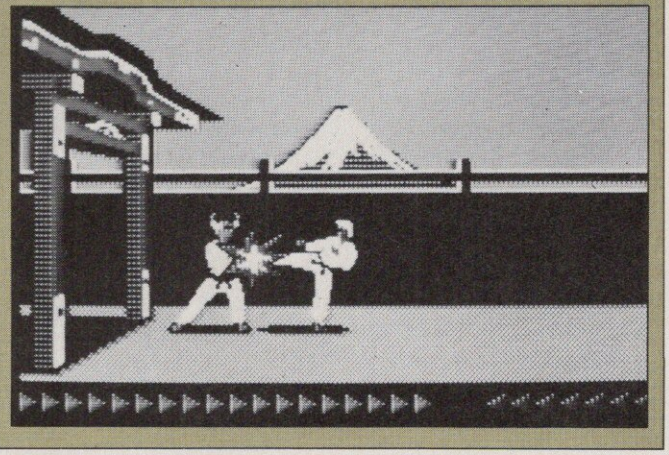
The screen shows a side view of you and your opponent. In battle, you can move only left or right. You cannot circle around the warrior or perform somersaults or flips. Hence, your maneuvering is pretty much restricted to slugging it out toe to toe in unarmed combat—perhaps a strategy for a heavyweight boxer, but not for a black belt.

Your offensive firepower consists of three kicks and three punches. Each warrior takes a certain number of hits before being pounded into unconsciousness. The challenge of Karateka lies in figuring out the fighting style of each warrior and then choosing the right combination of kicks and punches to send him into samurai slumberland.

The graphics are as smooth as the packaging promises. Your black-belted avenger, dressed in good-guy white, kicks and punches with grace, if not accuracy. Your beloved languishes in a dimly lit cell, waiting for her hero to rescue her. The enemy warriors, clad in bad-guy blue and orange and sporting fearsome masks, advance with purpose. Each hit results in an orange or blue explosion, similar to the effect of comic-book blows.

The best sound effect is a resounding battle cry before and after each engagement. Your adrenalin really starts pumping when you defeat a particularly crafty opponent, strike a dramatic pose, and then unleash a primeval yell.

You can rescue the princess without too much trouble, once you take the time to puzzle out the repetitious fighting style of each opposing warrior. Your most formidable foe is a savage blue falcon that is anything but the proverbial bluebird of happiness. Start kicking at the appropriate height



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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

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- 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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- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to ½ mile away from the A/D.
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The I/O manual includes many programs for inputs and outputs.

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when you see it appear on the screen.

The other fatal obstacle is a falling gate, underneath which you must never move. To pass by, stop just in front of the gate and kick. The gate falls and then starts to rise. As it reaches the top, run underneath before it crashes down again.

> Your most formidable foe is a savage blue falcon.

Karateka is a good adaptation of one-on-one karate, but I wish it included more offensive and defensive options and the ability to fight more than one opponent at a time. You can play the game either from the keyboard or with a joystick. Although the joystick is easier to use, the keyboard gives you more control over your player. I do find the game intriguing, and it certainly holds enough action, graphics, and sound to please video-game black belts everywhere. Simulating the human form on screen is hard enough, much less duplicating fluid fighting movements. Give Brøderbund and programmer Jordan Mechner credit for producing a quality game.

Russ Lockwood

Karateka
Brøderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
List Price: $34.95
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive (two-button joystick recommended)

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Joystick yoke? Check.

Flying goggles? You've got to be kidding. Real pilots don't wear goggles. No check.

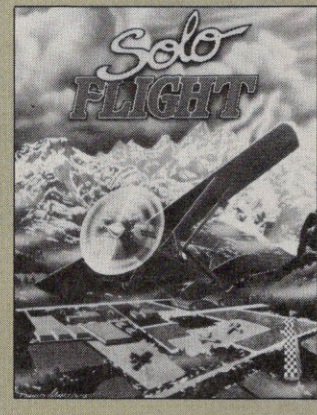
Power on? Check.

All checked out? Check and double-check—take off!

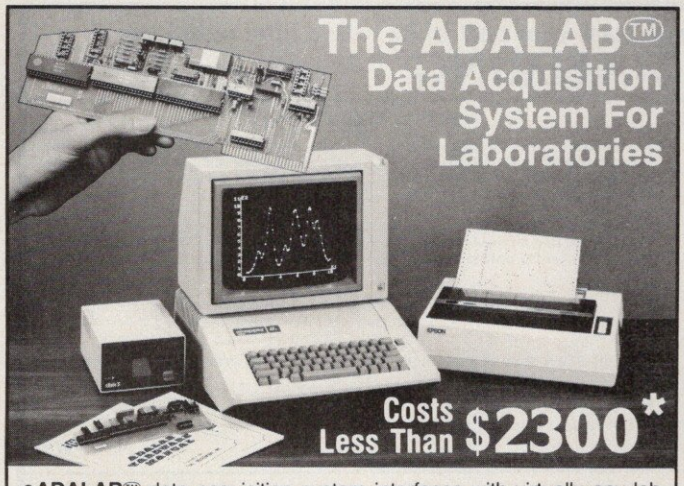
Solo Flight takes you and your Apple into the wild blue yonder, even if you've never flown an airplane. This flight simulator is so easy to use that first-time fliers will be swooping low over Kansas cornfields and soaring past Mount St. Helens in no time.

You may choose to fly in one of three areas: Kansas, Washington, or Colorado. Each area retains the geographical features of the state. Thus, Kansas is generally flat, and Washington and Colorado are mountainous.

A replica of an instrument panel appears on the screen. Instruments include a throttle; altimeter; and



heading, bank, navigation, and pitch indicators. As with a real aircraft, the results are faithfully reproduced on your instrument



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panel as you perform maneuvers and alter the control settings. The only missing equipment is a radio.

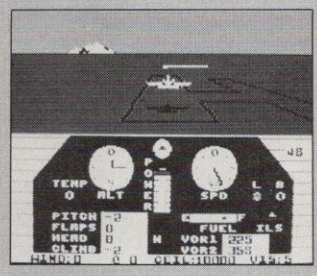
The graphics are not as sophisticated as those of Microsoft's Flight Simulator or other MicroProse flight simulators, but the program provides fairly smooth animation and enough graphics to give novice pilots an appreciation of real flying.

The one sticking point is the airplane itself. In Solo Flight, you see an out-of-cockpit view, except that the tail of your airplane appears in front of the windshield. I keep wishing for a machine gun to shoot myself out of the way. Furthermore, when you bank, the program tilts the plane rather than the horizon.

After performing barrel rolls and corkscrew dives on other simulators and seeing the horizon sway drunkenly in front of me, I felt a bit disappointed after taking Solo Flight for a spin. It has no horizon rollover, and the plane interferes with the view of the runways.

Although the program does not include a "flight simulator," it does include a fun game called Mail Pilot. Neither rain, sleet, hail, nor snow must keep you from delivering mail to the airports in the area. Deteriorating weather conditions, mechanical failures, and several skill levels make this an interesting and challenging aerial odyssey.

Solo Flight is a good introduction to flight simulators. The more bloodthirsty pilots among you will find the lack of dogfights somewhat dull—you should try



F-15 Strike Eagle by MicroProse. If you are looking for a calm afternoon of flying pleasure, however, Solo Flight may be right up your runway.

Russ Lockwood

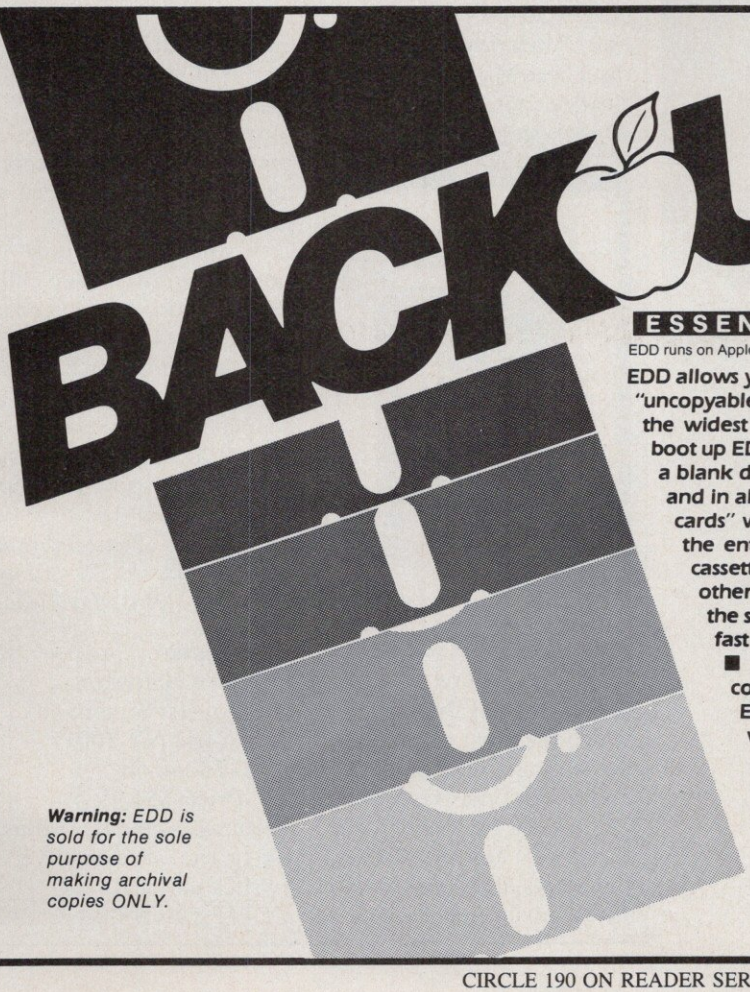
Solo Flight
MicroProse Software
10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151
List Price: $34.95
Requires: Apple II, II Plus, IIe, or IIc; 64K RAM; one disk drive (joystick recommended)

CIRCLE READER SERVICE NO. **364**

TORTUOUS TIME TRAVEL

USAdventure starts with a good idea—combine an adventure-game format with trivia questions about United States history, and then add some surefire graphics. The result should be an interesting, fascinating, and educational game. Alas, somewhere between the initial idea and the final result, a creeping boredom filters into the fun and robs USAdventure of its educational value.

The whole idea is to travel throughout the U.S. and figure out the order in which the states came into the union. You start in Delaware, which happens to be the first state, and you then pick a compass direction from which to move around the country.



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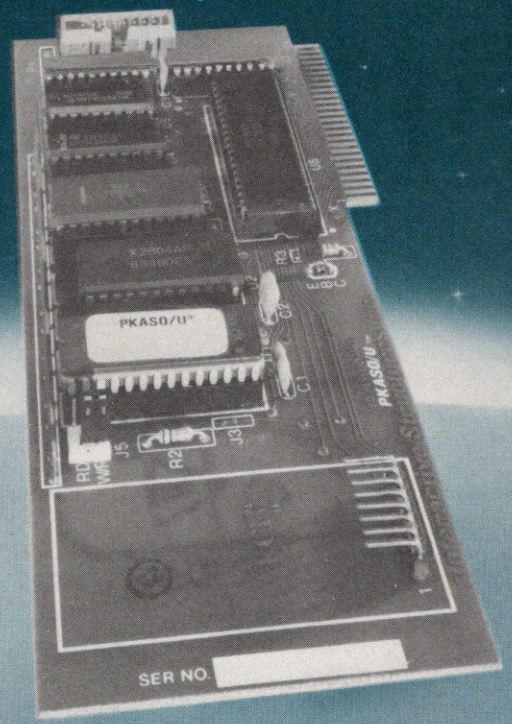
$79.95 Ask for EDD at your local computer store, or, *to order direct;* send **$79.95** plus $2 shipping ($5 foreign). Mastercard/Visa accepted. *Prepayment required.*

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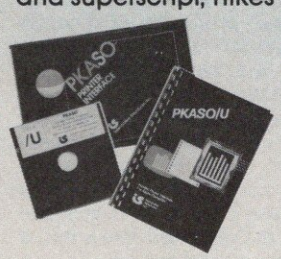


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THAT'S entertainment

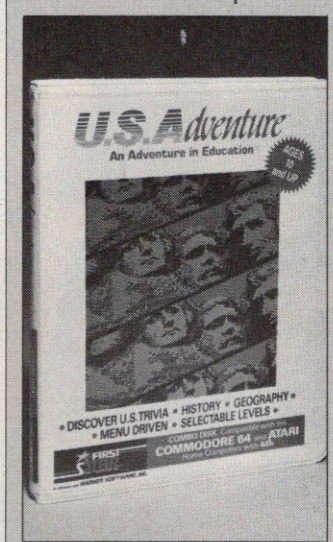
If you already know that Pennsylvania was the second state to come into the union, you head there immediately. If you don't know this fact, you are doomed to roam the map until you stumble across the right state.

Herein lies the game's major problem. It is boring to travel blindly around and through the states. Wandering through the country is akin to being lost in a maze. Scotty, beam me out of here!

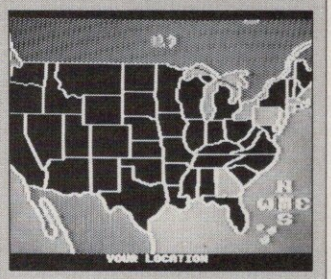
Test Your Knowledge of History

Once you do reach the appropriate state, if you have not reached a state of frustration first, the program presents you with several events associated with that state.

For example, in Pennsylvania, the available events include Lincoln's Gettysburg Address, the Declaration of Independence, and the Three Mile Island nuclear reactor mishap.



You then enter a time tunnel to guess the year in which the event occurred. To continue the example above, you time-travel to 1863, 1776, and 1979 for the correct answers about the events in Pennsylvania. If you do not find the correct date on the first try, the program tells you if the



event falls before or after the year you selected.

The time tunnel sports colorful, almost hypnotic graphics. With the changing years in the center of the screen, the colors rush toward you or away from you, depending on whether you are traveling forward or backward in time. The map of the U.S. generally reproduces each state faithfully.

USAdventure holds many interesting facts, but moving around to get to the facts presents new adventures in tedium. Finding the order in which states were admitted into the Union seems to take forever. It would be better if the program allowed you to locate an event in history as you passed through a state.

If you need an educational program to help children memorize a sequence of events in U.S. history, USAdventure may be for you. Or you could pick up a couple of history books—you get a chronological listing of events as well as photos, maps, and the significance of each event in U.S. history.

Russ Lockwood

USAdventure
First Star Software
18 East 41st Street
New York, NY 10017
(212) 532-4666
List Price: $34.95
Requires: Apple II, II Plus, IIe, or IIc; one disk drive; joystick optional

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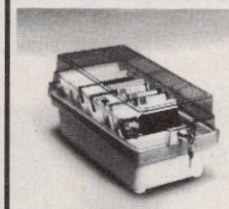
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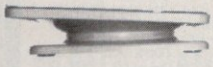


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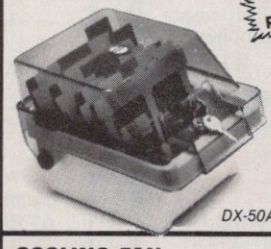


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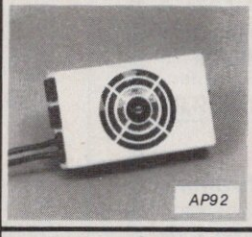
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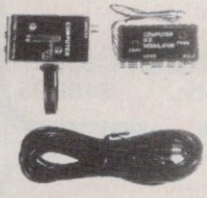
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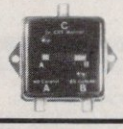
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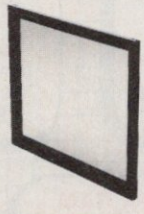
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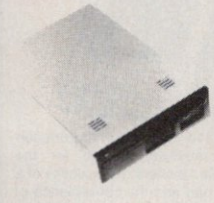
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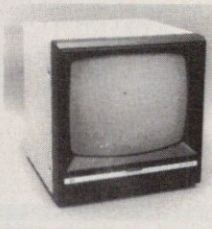
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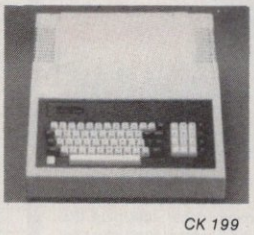
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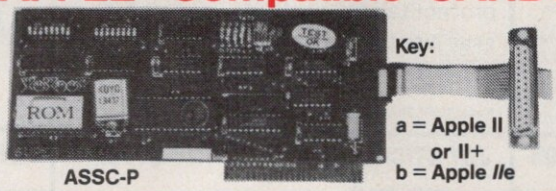
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ADD-12. . . . $159.95

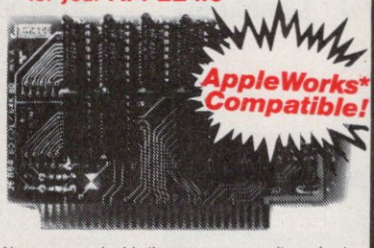
APPLE™ *IIc* Compatible 5¼" Half-Ht. Disk Drive

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NEW!

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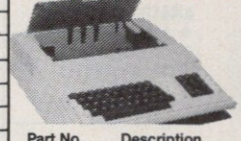
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SPEAKING OF GRAPHICS
BY ROBERTA SCHWARTZ AND MICHAEL CALLERY
New books and new products for the Apple II and the Macintosh

READING, WRITING, AND DRAWING

Your letters are arriving, and so far we've answered about half of them. Please be patient while we get to the rest.

Books on Apple Graphics

One question that pops up frequently is: Are there any good books on Apple graphics? Here are a few titles we recommend to our students.

For a good overview of Apple computers—from soup to nuts—we like Lon Poole's *Apple II User's Guide* (Osborne/McGraw-Hill).

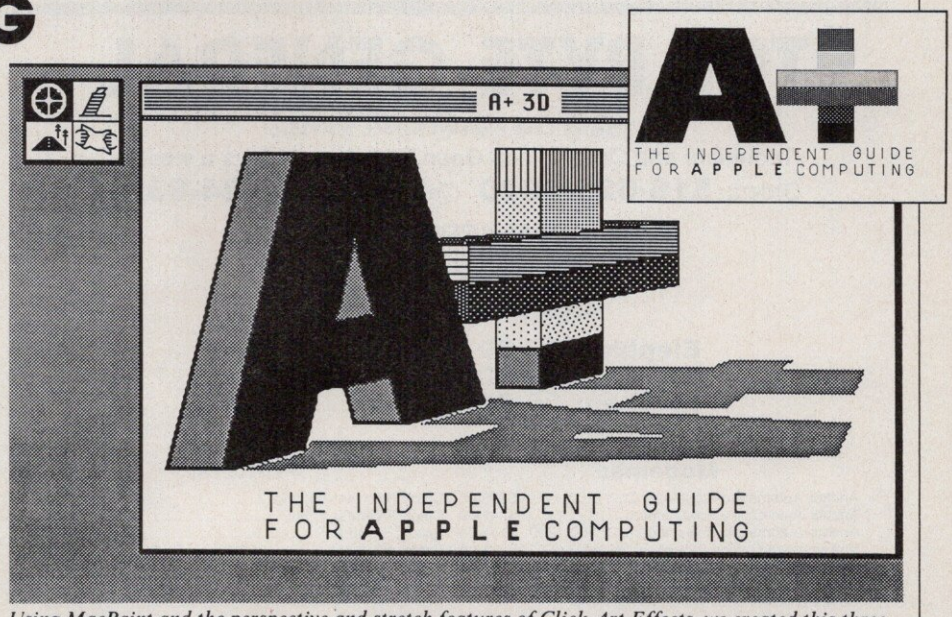
Microcomputer Graphics by Roy Meyers (Addison-Wesley) has many Applesoft BASIC programs that illustrate concepts such as high-resolution text generation, 3-D transformations, hidden-line removal, clipping, and so on. Some mathematical background is helpful if you use this book.

Apple II Computer Graphics by Ken Williams and R. and L. Kernaghan (Brady Publishers) is a comprehensive graphics book with an emphasis on animation and game design. The book covers low-resolution, high-resolution, block shapes, Applesoft shapes, and more.

Art and Graphics on the Apple II/IIe by W.H. DeWitt (Wiley Press) has many Applesoft BASIC programs that produce interesting graphic designs.

If you'd like a more complete computer-graphics bibliography, send us your request with a stamped, self-addressed envelope. We'd like to be immodest and mention our book, but it won't be available until the fall.

We've received a copy of a new product that gives the Apple II superhigh resolution in black and white. The Graphics Tool Kit consists of an interface card and software. It appears to be an excellent utility for specialized graphics applications such as CAD/CAM, music composition, and so on. We want to spend a little more time with it, so we'll tell you more in our next column.



Using MacPaint and the perspective and stretch features of Click Art Effects, we created this three-dimensional logo with a cast shadow.

We're happy to say that Penguin Software has released a double-hi-res version of its classic program The Complete Graphics System. The package comes with a two-sided disk: one side has the standard hi-res version, and the other side has the double-hi-res version. In addition, Penguin has released a new program, Magic Paintbrush. Described as a computer drawing program for beginners, this program is essentially a watered-down version of the Draw and Paint modules in CGS. Magic Paintbrush comes with the Apple standard and double-hi-res version on one side of the disk and a Commodore version on the other side. Both programs are a welcome addition to the company's fine line of graphics software.

Double-Hi-Res Blues

If you've been exploring double hi-res with the commercially available utilities, you're probably a bit frustrated. Some of these programs work under ProDOS, and some work under DOS. If you're like us, you've made more than your share of conversions from DOS to ProDOS and back. Getting the picture onto the correctly formatted disk is only half the problem, however. Unfortunately, there's little standardization in the way a double-hi-res picture is stored. The result is that pictures you create with one program won't be accepted by another.

A double-hi-res image occupies two discontinuous areas of memory; half the image is in main memory and half in auxiliary memory (see "Seeing Double," *A+*, December 1984). The image, then, is obviously saved in two files, one holding the main image and the other the auxiliary image—or is it?

According to Peter Joselow, the coauthor of DoubleStuff, Apple requested that developers save double-hi-res images to one file, with the auxiliary portion of the picture stored first and the main portion following. There's rhyme to the reason—this format is identical to the format on the Apple III (which has had double hi-res all along).

Of the currently popular packages, however, only Dazzle Draw saves each picture to one file. Beagle Graphics and the double-hi-res Complete Graphics System use a two-file format.

Like us, you may want to use all three packages to produce one finished graphic. We use Dazzle Draw for its ease of drawing and its editing options, Complete Graphics System for its exotic brushes and "tricks," and Beagle Graphics for its programming capabilities and its packed-picture slide-show utility.

How to Get from There to Here

If you have a drawing you made with Dazzle Draw that you want to work on with either of the other double-hi-res packages, you'll have to convert the picture file to DOS 3.3 and then split the file in half. To do this, exit from Dazzle Draw and use the File Convert program on the ProDOS User's Disk or the Apple IIc (or IIe) System Utilities Disk to convert the Dazzle Draw picture file to DOS 3.3. Next, BLOAD the file to address 8192 ($2000) with the command

```
BLOAD filename,A8192 (Return)
```

Your next step depends on whether you want to use your picture with Beagle Graphics or Complete Graphics System; the two programs require different filename suffixes.

If you're using Beagle Graphics, type

```
BSAVE filename.AUX,A8192,L8188
(Return)

BSAVE filename,A16384,L8188
(Return)
```

If you're using Complete Graphics System, type

```
BSAVE filename.DPA,A8192,L8188
(Return)

BSAVE filename.DPM,A16384,
L8188
(Return)
```

You can now use your Dazzle Draw double-hi-res picture in either of the other two double-hi-res programs.

If you're using the ProDOS version of Beagle Graphics, you can skip the DOS 3.3 conversion, but you still must split the Dazzle Draw picture file into main and auxiliary portions, using the above commands.

To go in the opposite direction (from Beagle Graphics or CGS to Dazzle Draw), you must save your two-file picture as a one-file picture. To do so, BLOAD the picture onto the screen (both the main and the auxiliary). Type

```
BLOAD filename.AUX, A8192
(Return)

BLOAD filename, A16384
(Return)
```

This is the main portion of the picture. Then type

```
BSAVE filename, A8192, L16384
```

You now have your double-hi-res image saved as one file. Convert this DOS 3.3 file to ProDOS, and you're all set.

More for the Mac

We recently had the opportunity to see some of the latest graphics software and hardware for the Macintosh. One of the most notable programs is ClickArt Effects. With this desktop utility you can capture an image (or a part of it) and rotate it, slant it, stretch

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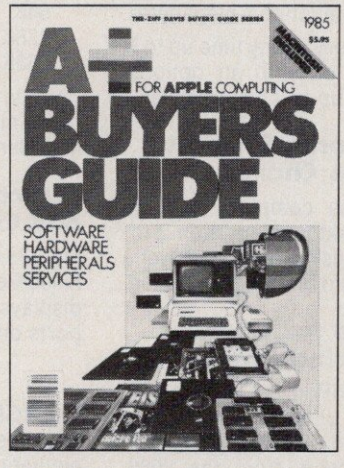
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it, and/or distort it. If you work with MacPaint, this utility is a must!

Hayden's Video Works is an exciting musical-animation package for the Mac. Watch for a complete review in an upcoming issue of *A+*.

Magic Slate is an interesting program that lets you create fast, bold, abstract images. The program gives you a variety of pens and patterns to work with. Pen sizes range from small to huge. This program is not for detailed drawing and painting, but rather for "creative expression."

ColorPrint lets you print MacPaint documents in color. We will take a look at ColorPrint, colored ribbons, and iron-on ribbons next month. Hint: If you can't wait for the review and you have the patience to swap Imagewriter ribbons, do get ColorPrint. The results are excellent. The process is tedious, but it'll have to do until we get a color Macintosh.

Keep Drawing

That's it for now. Keep reading, keep writing, and—most important—keep drawing. ✚

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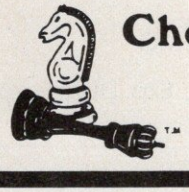
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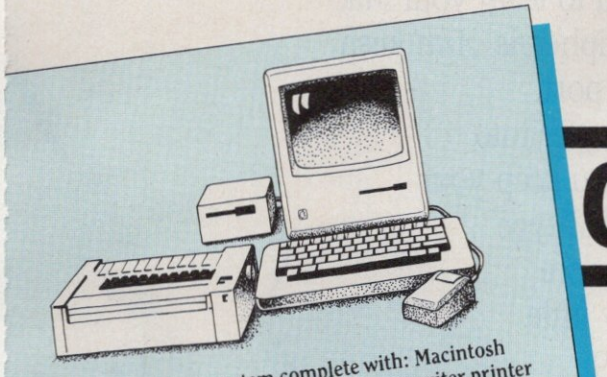
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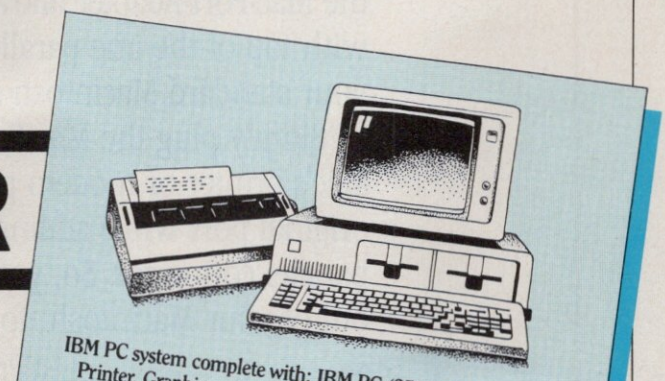
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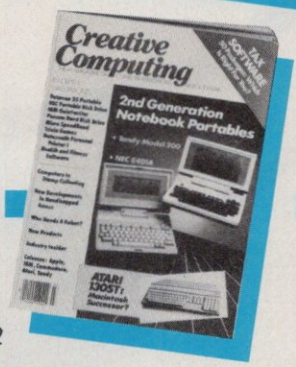
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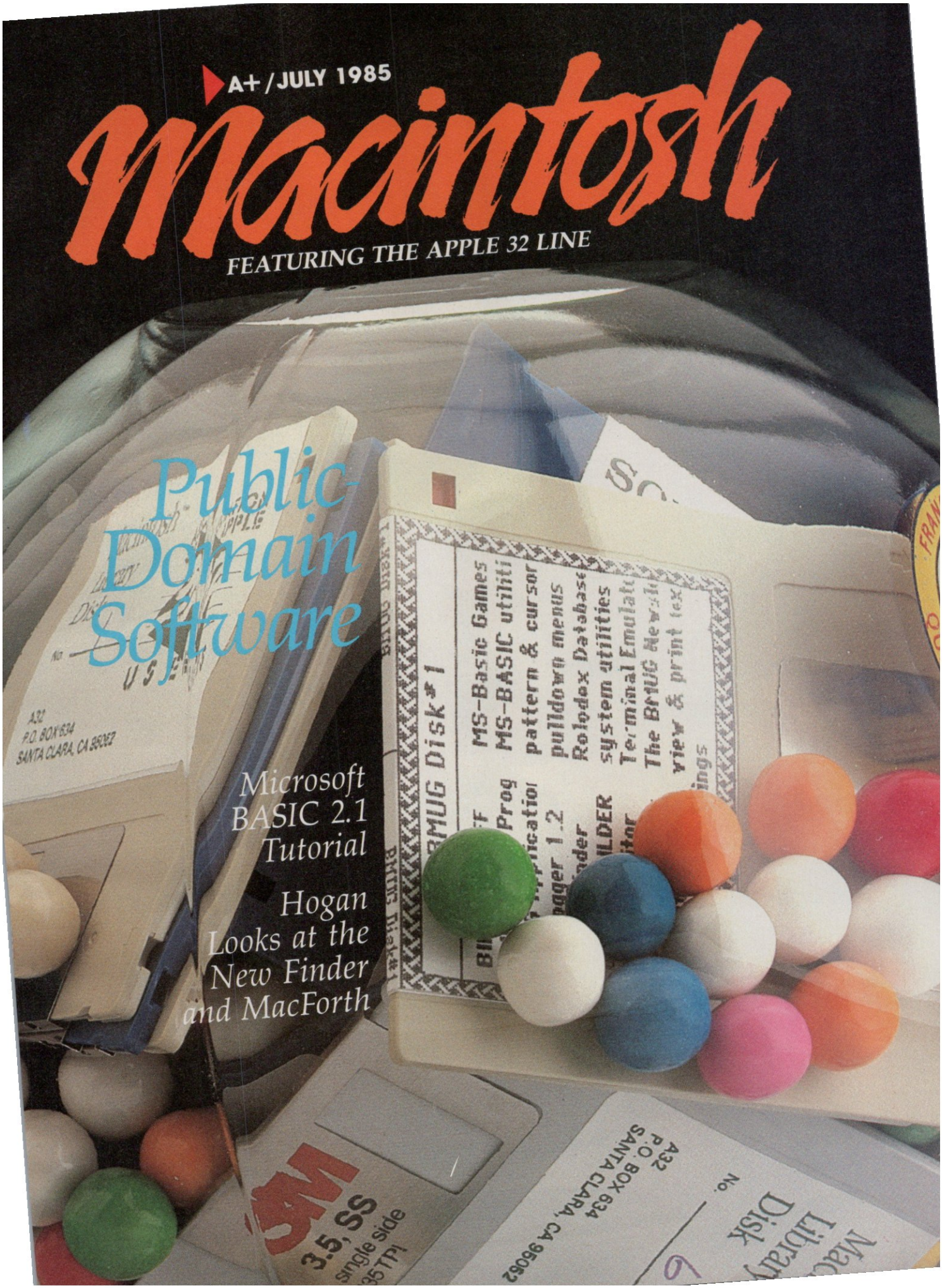
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ATTENTION

Public-domain software for the Macintosh

PENNY-WISE PROGRAMS

Did you know that many interesting Macintosh programs are available for little or no cost? If not, then you haven't heard about public-domain software. *Public-domain software* refers to programs that you can copy freely without having to worry about violating copyrights. The authors of public-domain programs are generous souls who are willing to share the fruits of their labor with the computer-using public.

The number of public-domain programs for the Mac is increasing continuously. *A+* already knows of more than 30 diskettes filled with public-domain software for the Macintosh that users' groups and other organizations are distributing. If you like the idea of building a large software library at a low cost, then public-domain software is the way to go.

Earlier this year, *A+* covered public-domain software for the Apple II series (see "Software on a Shoestring," January 1985, pages 71–78).

In this first part of a two-part article, I take a look at some of the most interesting and useful Macintosh application and utility programs in the public domain. Next month, I'll cover many of the other types of programs available. But first, the answers to two questions: What is public-domain software, and where do you find it?

Methods to Their Madness

The term *public-domain software* seems to imply that all public-domain programs have the same basic characteristics. They do, in fact, share one very important quality: You can copy all of them freely and legally for personal use. Otherwise, the differences are usually greater than the similarities—software writers seem to create new ways of sharing their programs every day. The most common of these variations is also the simplest: The software is uncopyrighted, with no strings attached. You should assume that one string is, in fact, implied (if not explicitly attached): that the software is provided for personal use only. (If you want to use it in any other way, you should obtain permission from the author.)

Most of the other major approaches to public-domain software involve a copyright, but the authors give their permission for personal use to anyone possessing a copy. Some authors stop right there, but others request a small fee (usually $5 to $10) in recognition of their efforts, or they may ask that you donate a similar amount to their favorite charity. A somewhat larger fee (anywhere from $15 to $50) is requested by some authors, in return for which they usually provide some sort of support—nothing as fancy as a toll-free hot line, mind you, but frequently such things as notification of new versions and a willingness to answer cries for help. These minimal-charge methods of distributing software are sometimes called shareware or freeware.

The most important thing to remember, however, is that even if the author requests a fee, if you decide that you don't like or need the program after having experimented with it, you don't have to send a check. While I am on the subject of money, I should mention one other hidden expense of public-domain software that you should be aware of. Many programs are not self-running applications, but instead require that you use a language such as Microsoft BASIC (MS-BASIC) in order to run them. Since languages such as MS-BASIC are copyrighted, software authors cannot provide them along with the program in question. Thus, you must buy a copy of MS-BASIC, even if you don't know a thing about programming, to be able to run the programs that require it.

Sources of public-domain software abound, and you can obtain it in many different ways. Probably the most enjoyable method is simply to swap programs with friends and colleagues who have programs of interest to you. One of the

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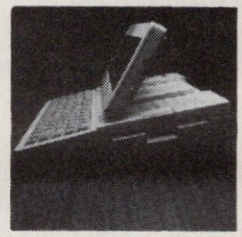
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benefits of this approach is that your associates have probably already tried the software and may have some advice or warnings to offer. Not everyone has such valuable friends, however, and for those of us who don't, there are many other sources of public-domain software.

Users' groups often maintain a library of public-domain software for their members. The programs are usually available on a series of disks. You decide which programs you want and then purchase the disks that contain them, either at a group meeting or through the mail. NYMUG (New York MacUsers' Group), for example, has seven disks of programs available (as of this writing). As with most software from such libraries, the programs on the NYMUG disks are not organized in any coherent fashion. Usually users' groups charge for these disks (NYMUG asks $8) to cover the cost of the disk, duplication, and order processing. Since such software libraries expand constantly, it pays to check every month or two to see if new disks are available.

Some public-domain software is available from the author through the mail, usually for a small fee ($5 or so). The advantage of acquiring a program this way is that you can be sure of getting the most recent update, a complete documentation file, and possibly some goodies that are missing from freely circulating copies. The disadvantage is that it takes time.

Speed demons who can't wait for their friends or the mail can acquire public-domain software electronically. Some electronic bulletin-board systems (BBSs for short) are run by generous individuals, others by clubs for the benefit of their members. In addition to files of news, gossip, and help, many BBSs have a section de-

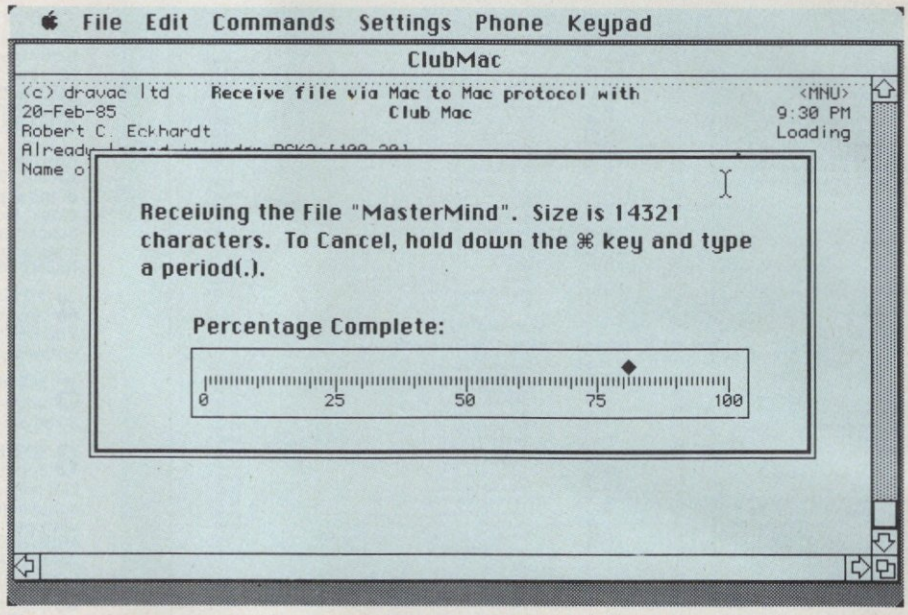


Figure 1: When you download files from the Club Mac BBS using MacTerminal and VT-100 emulation, a ruler-like meter shows you how the transfer is progressing.



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voted to public-domain software, which you can download (transfer) from the BBS to your disk drive via a modem, the phone lines, and the appropriate software. If you already own a modem and the software to use with it, and if your area has a BBS, you can acquire public-domain software quickly for no more than the cost of a local phone call.

One of the best BBSs for people interested in public-domain software is run by Club Mac, a national users' group located in Houston, Texas. Although Houston is not a local call for most people, this BBS is well worth exploring for those who have the necessary communications software. Club Mac is in the process of converting to a Uninet hookup with an hourly charge, so by the time you read this, the call may in fact be free—and the hourly rate will probably be lower than that of most long-distance calls. (See figure 1, a sample Club Mac screen that shows a file transmission in progress.)

Many public-domain programs that are available on BBSs were originally copied (or are also available) from a single important source: the section of CompuServe called the Micronet Apple User's Group. CompuServe has many sections, of course, of which MAUG is just one, but MAUG is one of the most active areas of CompuServe, and it contains perhaps the largest and most fascinating library of public-domain software anywhere.

You have to pay a membership fee to join CompuServe, and you must pay an additional hourly rate for the time you spend on-line. Unless you live out in the sticks, however, you can reach CompuServe through a local telephone number that connects to one of several possible nationwide access networks. Thus, for most people, the call itself is not a major expense, and once you learn your way around CompuServe, the cost of exploring for and downloading public-domain software is not unreasonable.

Although many public-domain application programs are available for the Mac, they vary widely in quality. Some of these programs do perform functions currently unavailable in commercial form, though.

Take Screen Maker 1.0 by Bill Atkinson, for example. This small (6K) and simple program converts the upper-left portion of a MacPaint document into a new opening screen that you can place on any start-up disk. Thus, if you are tired of Welcome to Macintosh, you can replace it very easily with, say, Beam me up, Scotty. You can also convert an existing start-up screen to a MacPaint document in order to alter it according to your taste and then convert it back again. The program has no documentation, but its operation is essentially self-explanatory. All you need to do is convert any existing start-up screen back to MacPaint to determine exactly which part of a MacPaint document the program uses.

Another public-domain program is important if you download programs from MAUG or a BBS. Many files are converted to a special format for transmission via modem and the phone lines. If you download such a converted file (they usually have a



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#M4	Macintosh, KYBD, Mouse, Imagewriter, Ext. Disk Drive, and Numeric Ten Key	$32.95
MACINTOSH XL SETS		
#L1	Macintosh XL with Profile Piggyback	$25.95
#L2	Macintosh XL 2/5, 2/10	$23.95

Set #	Contents	Sug. Retail*
APPLE IIc SETS		
#C1	Apple IIc KYBD and Monitor	$18.95
#C2	Apple IIc KYBD, Monitor, and Ext. Disk Drive	$24.95
APPLE IIe SET		
#E1	Apple IIe KYBD, Monitor, and Ext. Disk Drive	$25.95
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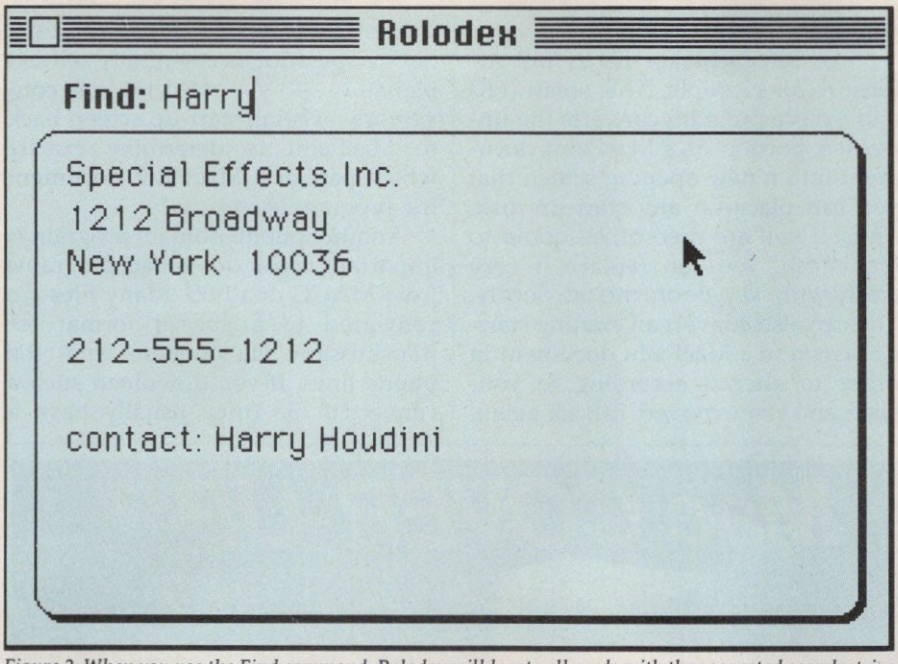
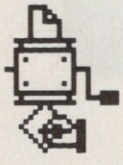


Figure 2: When you use the Find command, Rolodex will locate all cards with the requested search string (name, number, and so on), no matter where the string is located on the card.

three-letter code—either hex, hcx, or hqx—after the filename), you must then reconvert it in order to use it. BinHex 4.0 by Yves Lempereur takes care of this conversion amazingly quickly and efficiently. For example, a file that takes 20 minutes or more to download, once you choose it by selecting Upload ▸ Application from BinHex's File menu and then double-clicking on its name in the resulting dialog box, is converted and ready to go in seconds.



BinHex

Banner by John Gregory prints long linear signs on the Imagewriter. Because the program simply blows up individual pixels into large squares or circles (your choice), the results look best from a distance. Fonts that come in 36-point sizes work best if you want your letters to fill the width of the paper (which is, of course, the height of the banner). The Cairo font also works well at 36 points (since that is an even multiple of Cairo's true size, 18 points).



Banner

Mixing pictures and text into one long masterpiece requires a little sleight of hand, since each individual banner can handle only one font. All you need to do, however, is print several single-font segments in sequence, taking care to override the form feed (by rolling back the printout), should any segment end in the middle of the page.

If you have difficulty controlling the buildup of notes you take on odd scraps of paper, then Rolodex by Bill Atkinson may be the answer to your problems. It acts almost like a real Rolodex, except that it can flip through cards far faster than any human can. It also can search the cards for any word or group of words, regardless of where on the card they might appear (see figure 2). It doesn't do anything fancy such as dial the phone number it just found, but you can use it to keep track of all kinds of notes, not just addresses and phone numbers.



File

File 1.0 by Cary Clark is a simple text editor that permits only one predefined font in a single size and style. What you lose in looks, however, you gain in speed, and by being able to open more than one window at a time. All of these attributes make File especially appropriate for use in conjunction with programs such as the Red Ryder terminal program (see page 111) that require that you write dialing procedures and macro definitions with a separate editor and then save them as text only (see figure 3).

Another version of Clark's File, called 1.UTAH, allows for three fonts in two point sizes, as well as a few format options. This version makes for a nice demonstration of multiple windows, but the simpler version is more useful as a stripped-down text editor.

If the sluggishness with which MacWrite reformats or searches large documents is a source of irritation (it certainly is for me), then Edit by Bill Duvall may be an appropriate cure. After what seems like hours of waiting for MacWrite to convert a large document from 9-point Monaco to 12-point New York, the speed with which Edit performs the same tasks is difficult to believe. Like File, it also lets you use multiple windows (al-



Edit

(continued on page 113)

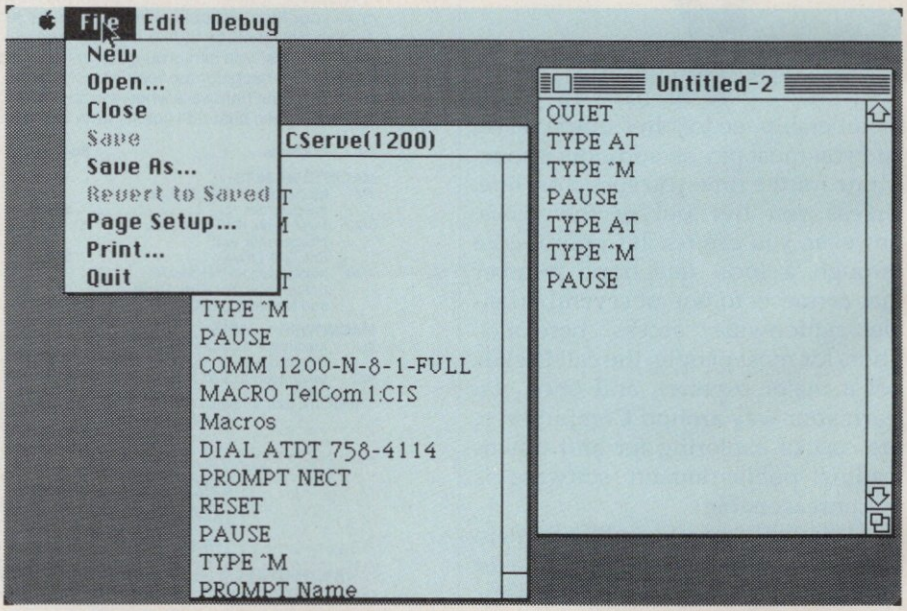
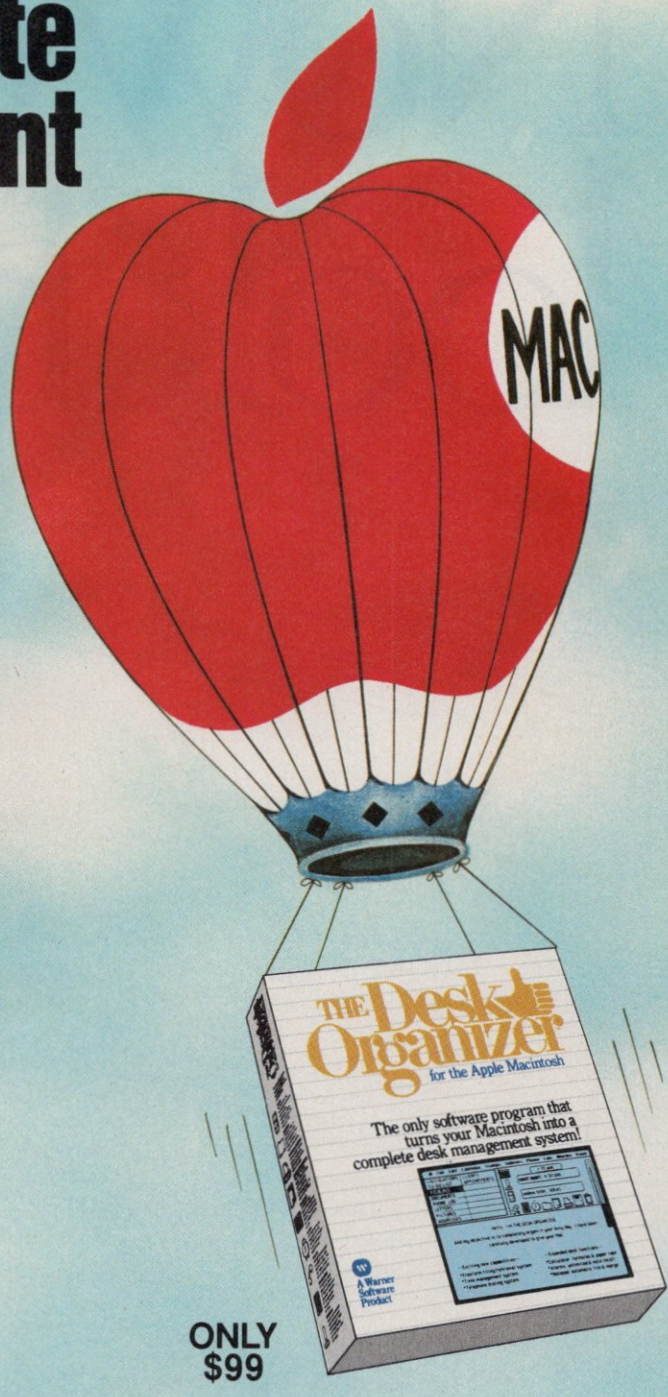


Figure 3: File 1.0 allows you to open several windows at once, so you can use one window as inspiration for what you are writing in the other. You can also copy and paste directly from one window to another.

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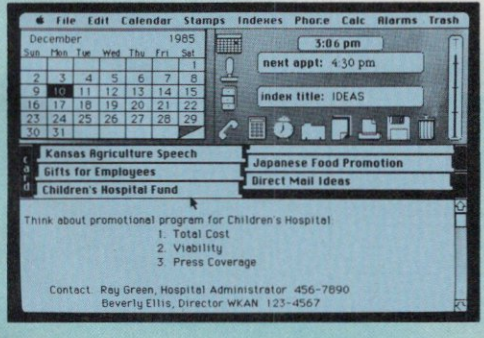
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Now data do look base.

The Spokesman

PRICE LIS

Effective January, 1985

umber	Product Description	Price
45	Water Bottle	15.00
L	Ladies 26" Breeze 10 Speed	179.00
0	Bicycle Built For Two	249.00
00		69.00
7M		
100		
A911		
A901		
92		
796		
650		
BS200		
BA101		
BBA102		
27AW		
26AW		
SB 231		

The Spokesman

STOCK BOOK

Description Handlebar Tape

Number HT100

Opening 20

Last Inventory Date January 10, 1985

Closing Stock 10

Current Inventory Date March 31, 1985

Reorder Point 8

Understocked by -2

Vendor MiracleTape Inc.

Vendor Address 66 Tacky Drive Stickyville, MA 01701

Comments Available in brown, re

To: Acme Water Bottle Sales
2389 E. Salem Drive
Kiokuck, Iowa 23668

To: American Bicycle
234 Main Street
Philadelphia, PA 03456

To: MiracleTape Inc.

The Spokesman

12 Bearing Street Wheeling, W.VA 26055

March 6, 1985

Jeremy Williamson, Jr.
1456 East Raybourne Road
Farmville VA 23944

Dear Jeremy:

Thank you for your recent order from the Spokesman Company. We are currently processing your order for immediate shipment. The following list represents the totals we have received in our shipping department.

2	27" alloy wheel	# 27AW	at	$62.00	$124.00
1	Seat Post	# 5792	at	$22.78	$22.78
4	Brake Shoes	# BBS200	at	$3.00	$12.00
2	Saddle Bags	# SB 231	at	$38.00	$76.00

Total Order: $234.78

I am confident
products for yo
free number if
modify the or
telephone pri
adequate noti

Thank you a
again in the

Sincerely,

John L. Sp

The Spokesman

Vendor	Description	Item Number	Closing Stock	Under-Stocked
Acme Water Bottle	Water Bottle	AC 2345	8	4
Totals for Acme Water Bottle Sales		Unique items 1	Units in Stock 8	Reorder units 4
American Bicycle	Ladies 26" Breeze	AB26L	3	4
American Bicycle	Bicycle Built For Two	AB200	4	-1
American Bicycle	Solo Unicycle	AB100	5	8
American Bicycle	Mens 27" Blazer	AB27M	3	1
Totals for American Bicycle		Unique items 4	Units in Stock 15	Reorder units 9
MiracleTape Inc.	Handlebar Tape	HT100	10	-2
Totals for MiracleTape Inc.		Unique items 1	Units in Stock 10	Reorder units -2
Miyaka Bicycle	Chrome forks for 27"	FCA911	2	1
Miyaka Bicycle	Red Flyer Bike	FCA901	4	1
Totals for Miyaka Bicycle		Unique items 2	Units in Stock 6	Reorder units 2

		2		
		5	1	$15.95
		3	3	$1.75
Units in Stock 10	Reorder units 7		$14.65	Total Restock Cost $43.95
Units in Stock 49	Reorder units 20			Total Restock Cost $65.15
				Total Restock Cost $1,330.81

The Spokesman

PURCHASE ORDER

To: Weinmann, USA
88 Skid Row
New York, NY, 01103

Description	Item Number	Units	Unit Price	Extended Price
Brake shoes	BBS200	2	$0.50	$1.00
Brake lever, right front tire	BBA101	1	$5.45	$5.45
Brake lever, left front	BBA102	2	$5.45	$10.90

Amount of Purchase order:	$17.35
Sales Tax:	$1.12
Total Amount of Purchase order:	$18.47

esn't have to

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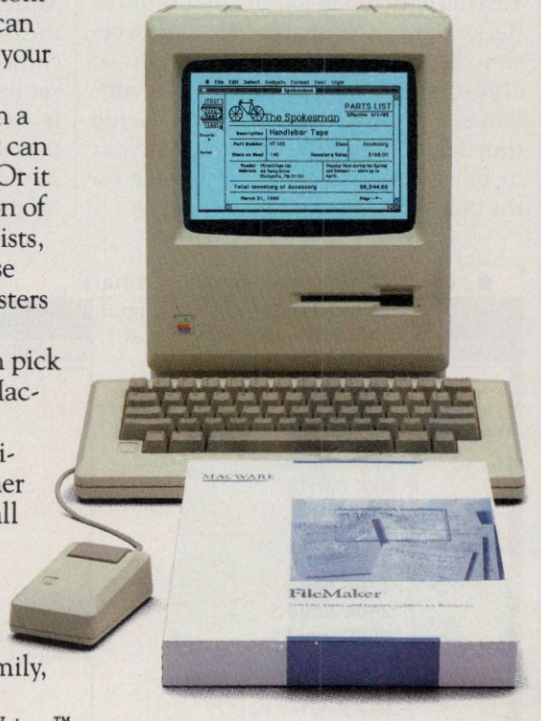
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PUBLIC-DOMAIN COMMUNICATIONS PROGRAMS

The list of public-domain communications programs and their origins reads like a biblical genealogy (so-and-so begat such and such, and they had ten children, and so on). Just as in the Bible, though, the family tree may contain a lot of names, but only a few play an important role. Thus, if you are in the market for a communications program, I suggest you look at one or more of the following better-known relatives first.

MacTEP by Dennis Brothers is one of the truly venerable public-domain communications programs for the Macintosh. For good reason, too—in its many versions, it remains fairly simple, predictable, and reliable. MacTEP was first published in the May 1984 issue of *A+*, and an improved and corrected version appeared in "MacTEP Revisited" (*A+*, July 1984, pages 93–97). For people who are new to telecommunications and have MS-BASIC 1.01, MacTEP 1.81m (which has menus by Loftus E. Becker, Jr.) is probably the best version, with its straightforward menus, auto-dial for Hayes-compatible modems, and simple (straight ASCII) file transfers. The only tricky part is that to get phone numbers to appear on the auto-dial menu, you must enter them into the program listing (between lines 5030 and 5100) before running the program. Entering these numbers isn't particularly difficult; the trick is not to attempt to enter them directly onto the auto-dial menu.

BASIC 1.01 owners who want a few more features than are offered in MacTEP should try one of the following variations on Brothers' and Becker's original handiwork: AutoTEP.vs2, with third coauthor Michael McKay; Auto MacTEP Mouse 1.87, which adds a fourth coauthor, Jim Aliff to the list; and TEP Plus, by Brothers and Gary R. Voth.

For those who have MS-BASIC 2.0, RLMTEP 3.0, a rather extensive modification of MacTEP by Ralph L. Miller, is the one to try first. Because the documentation was written for an earlier version of RLMTEP, getting it set up properly can be a bit confusing. It is definitely worth the effort, though. RLMTEP has its own pull-down menus and thus looks and acts more like a stand-alone application than a BASIC program. Another major enhancement over MacTEP is that it not only dials but also logs automatically onto services such as CompuServe. As with MacTep, however, only ASCII file transfers are possible.

Getting RLMTEP set up is not really difficult—it's mostly a matter of giving proper names to the program's two parts. If you received a copy from a friend or a users' group, it's likely that the parts are already correctly named. If you downloaded them from MAUG (it is in DL8), then you need to rename them as follows: RLMTEP.302 should be changed to RLMTEP, and RLMTEP.303 must be renamed RLMTEP II. Hide RLMTEP II in a folder, and always start the program by double-clicking on RLMTEP.

Data for auto-dial, auto-log-on, and macros is entered near the beginning of the listing of RLMTEP (not RLMTEP II)—you'll see the DATA statements right after line 10. Follow the instructions from the old documentation (called RLMTEP.111 in DL8) to enter this information properly. Don't forget: If you enter only a phone number and no log-on sequence, you must include a set of empty angle brackets (<>) after the number, or the auto-dial will not work.

On its newest member disk, Club Mac includes a new stand-alone communications program called Pretty

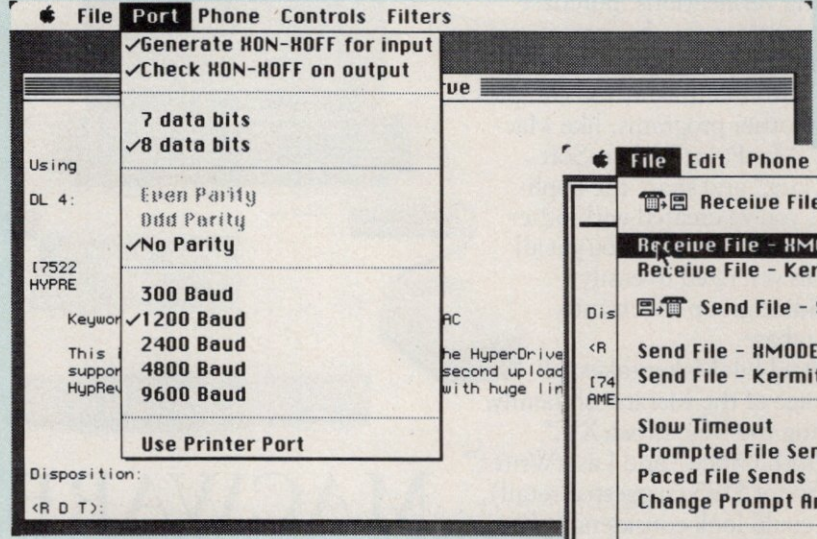


Figure 6: Pretty Good Terminal provides immediate access to the common telecommunications parameters through its Port menu.

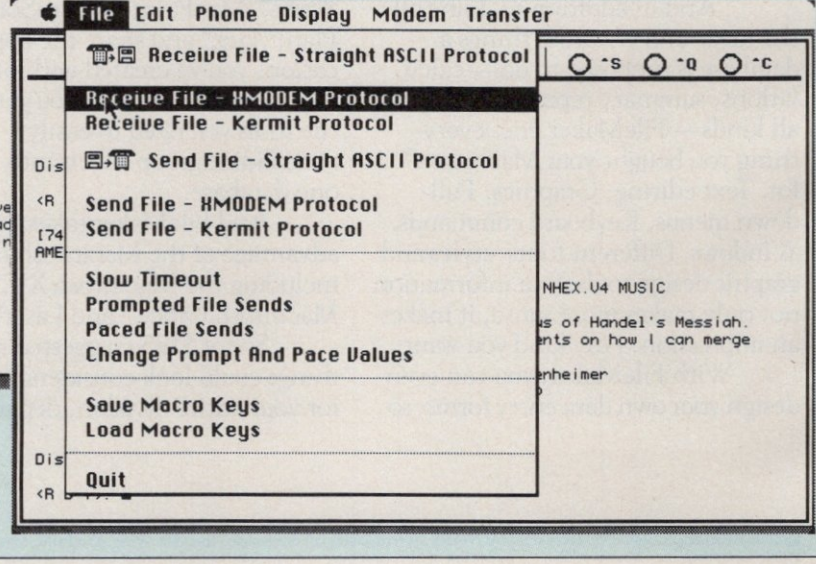


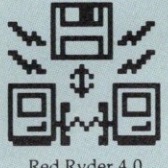
Figure 7: With its Slow Timeout feature and the XMODEM protocol, you can use Red Ryder to download files from CompuServe without encountering time-out errors.



PGTerm

Good Terminal by Philip Zimmerman. This program has a lot of nice features, including auto-dial, XMODEM error correction for file transfers, and easy menu access to telecommunications parameters (see figure 6). All in all, this program is pretty good. It does have a significant drawback for the serious telecommunicator, however: It doesn't support automatic log-on or the creation of macros. Also, oddly enough, despite the fact that Club Mac distributes it, it does not offer VT-100 emulation and thus cannot be used to access the Club Mac bulletin board.

Probably the most exciting public-domain telecommunications program to appear for some time is Red Ryder 4.0 by Scott Watson. This stand-alone telecommunications program fulfills just about everyone's dreams (except for that of VT-100 emulation). It has an on-screen clock and an on-screen telecommunications parameter bar that can be changed simply by clicking on it (the choices change in rotation). It supports auto-dial, auto-redial (if the number is busy), automatic log-on, and macro keys. It has a row of buttons you can click on to transmit commonly used control characters. Best of all, it has a special file-transfer choice called Slow Time-out, which, when used in conjunction with XMODEM, prevents time-out errors when you download from CompuServe—a common and exasperating problem (see figure 7).



Red Ryder 4.0

Red Ryder is not for the faint of heart. For example, automatic log-on sequences (here called Remote Service Procedures) must first be written in a text editor and then transferred to Red Ryder. The documentation, however, as in previous versions of Red Ryder, is quite good, rather humorous, and filled with plenty of useful examples. All in all, in fact, Red Ryder 4.0 gets my vote for the best public-domain telecommunications program so far.

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FINDING MAC SOFTWARE ON *COMPUSERVE*

CompuServe's Micronet Apple User's Group (MAUG), which covers both 8-bit and 32-bit Apple computers, has sections for bulletins, on-line conferences, public-domain-software exchange, and member-to-member. To get to MAUG from anywhere in the Consumer Information Service (CIS) part of CompuServe, type GO PCS-51 at any prompt (!). If you have never entered MAUG before, you will be asked to join simply by giving your name. Your membership should be processed within 24 hours (without charge).

Once you have entered MAUG, you are greeted by the Function menu. Select number 4 (Data Library) at the prompt; a new menu appears, listing the nine different data libraries in MAUG, and you are asked to choose one of them.

The important choices for Mac owners are the following: DL3 (for Data Library, subtopic 3) is primarily for programmers, although it is worth scanning from time to time by the rest of us; DL5 is for developers—most of the programs here are pretty hair-raising and largely unfathomable; DL8 is dedicated to communications programs and is definitely worthy of your attention, especially if you are using public-domain communications software; DL4 is the section of greatest interest, however, and is without doubt the single most important source of public-domain software for the Macintosh.

Since its creation more than a year ago, DL4 has grown to such a size that it is now almost impossible for a newcomer to survey its contents completely without ringing up a small fortune in on-line charges. If you are new to MAUG, the most sensible thing for you to do (until you are a little more familiar with DL4) is to first browse through 10 or 20 of the latest additions. To do this, simply type BRO at the DL4 prompt, and the library will give you brief descriptions of the software it contains—one at a time, starting with the most recent addition.

When you've seen enough, return to the top menu (by typing T) and try browsing according to a topic that interests you, by using the Key option. Type BRO/KEY: at the DL4 prompt, and follow the colon with a single word, such as GAME, that reflects an interest of yours. This procedure doesn't always work very well and sometimes yields unexpected results, since many of the people who contribute software to MAUG are not very careful about the keywords they choose. But unless you know the exact name of a program, this is probably the best way to start your search for interesting software.

FURTHER INFORMATION

Microsoft Corp. (Microsoft BASIC)
10700 Northup Way
Bellevue, WA 98009
(206) 828-8080
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CompuServe
5000 Arlington Centre Blvd.
P.O. Box 20212
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Apple Computer, Inc. (MacTerminal)
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New York MacUser's Group
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Berkeley Macintosh Users' Group
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(continued from page 106)

though, unlike with File, text does not reformat automatically to fit a resized window). Although Edit is not likely to replace MacWrite or Microsoft Word as anyone's basic writing tool, it is now my only choice when it comes to large-scale searches and formatting.

Because good commercial communications programs were a long time coming for the Mac (some say they still are), communications software has been, from the beginning, a fertile field in the public domain. For newcomers to telecommunications, some of the simpler public-domain programs are a logical place to start, because they offer few of the many options likely to confuse beginners. (See "Public-Domain Communications Programs" on page 110 for descriptions of some of these programs.)

If you've been using a Mac for any length of time, you have probably thought about ways you'd like to tailor its operation to fit your own style and special needs. So far, very little commercial software allows you to tinker with the way the computer works. The public domain, however, is full of little gems, called utilities, that let you customize the way your Mac works and accomplish a lot of other things as well.

One of the most useful utilities for customizing your Mac is Menu Editor 1.0 by Andy Herzfeld. If you've ever lamented that an often-used menu item does not have a keyboard equivalent, this program is for you. Say, for example, you frequently toggle the grid on and off when using MacPaint, but the lack of a ⌘-key equivalent forces you to pull down the Goodies menu every time you want to switch it on or off. With Menu Editor, you can add a Grid keyboard command (see figure 4).

Menu Editor is not totally bug-

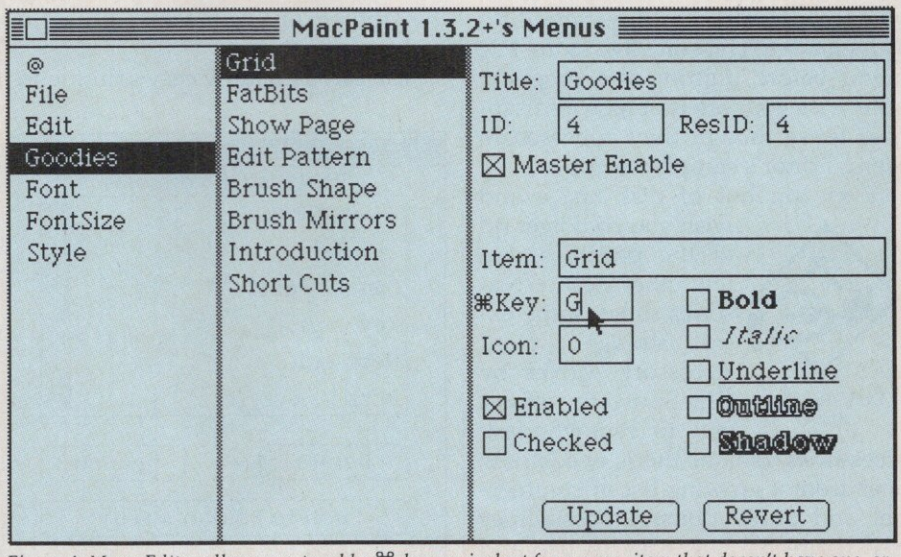


Figure 4: Menu Editor allows you to add a ⌘-key equivalent for a menu item that doesn't have one, or change one that does. Here Grid in the Goodies menu is being assigned ⌘-G in the small box, middle right. Note that the menu being worked on appears in the menu bar, so you can open it and confirm what you have done before quitting the program.

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free, so a little care is in order when you use it. (This caution applies to many public-domain programs, actually.) In particular, make sure that the command you are adding is not already provided by another menu item. Also, even though a selection box allows you to choose programs from any disk drive, it is best to place both Menu Editor and the program you wish to alter on the same disk. Remember to click on Save in the File menu before quitting the program; otherwise your alterations will disappear (even though they appeared in Menu Editor's sample menu).



Desk Accessory Mover

Ever run out of disk space and wish you could get rid of the puzzle and a few other desk accessories to get some extra storage? Desk Accessory Mover by CE Software allows you to remove desk accessories, rename them, or add new ones from a growing list of commercial and public-domain possibilities (see figure 5). It is easy to use and comes with a short but clear documentation file, as well as several amusing (but not very useful) desk accessories for experimentation.

The only drawback to the Desk Accessory Mover is its incredible slowness. The first time I used it, I was convinced that the program had crashed and my disk drive had gone berserk. I was wrong. It is just unbelievably slow. Sad to say, because the program permits you to install or delete only one desk accessory at a time, the problem of sluggishness is magnified even further.

You can try a fairly easy solution to the Desk Accessory Mover's slowness, however, if you have a 512K Mac. If you copy the System file and the Desk Accessory Mover to a RAMdisk and make the RAMdisk the start-up disk, the program will operate at a much more acceptable speed. A RAMdisk is a section of the computer's random-access memory that looks to you and acts to the computer just like a floppy-disk drive. Because it is actually a segment of RAM, however, it runs at electrical, rather than

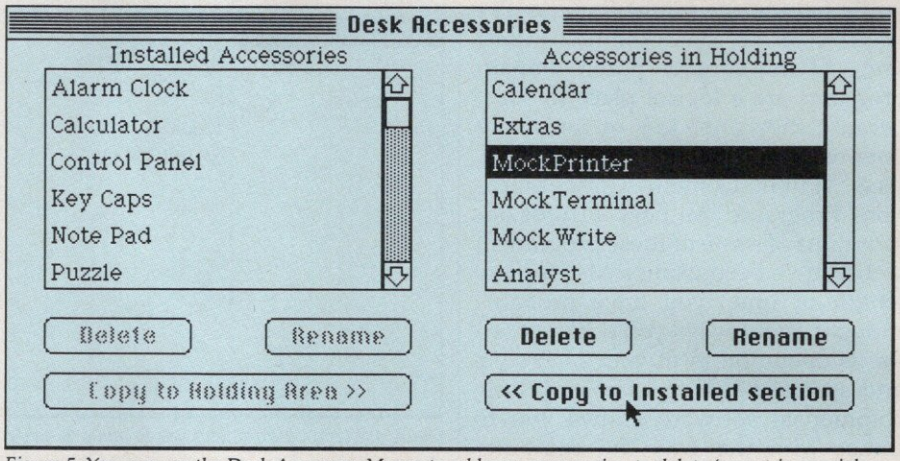
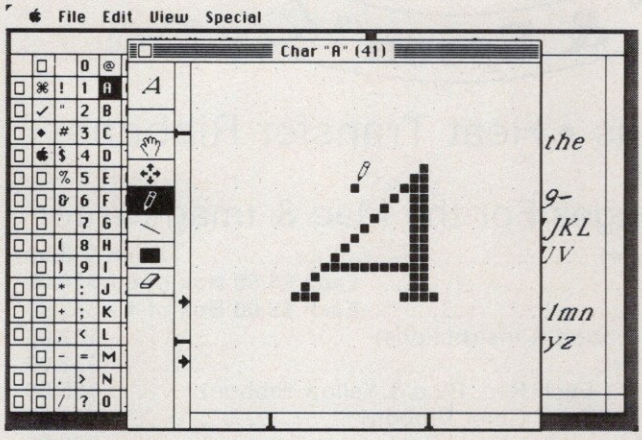


Figure 5: You can use the Desk Accessory Mover to add new accessories, to delete (or put in special storage files) the ones you no longer need, or to rename them. In this illustration, MockPrinter is about to be installed in the System.

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mechanical, speed. For the same reason, if you turn off the computer without saving the RAMdisk's contents to a real floppy, you will lose all the files on the RAMdisk.

If the idea of using a RAMdisk with the Desk Accessory Mover (or any other copyable program) appeals to you, then you should try a simple program called Ramdisk. It creates a

PUBLIC-DOMAIN SOFTWARE
A Selected List

Screen Maker
- MAUG's DL5 (SCRMAK.HEX)
- Club Mac BBS (SCRNMK.APL)

BinHex 4.0
- MAUG's DL4 (BNHX4.HCX)
- Berkeley MUG (Disk #10)
- Club Mac BBS (BHEXV4.APL)

Banner
- MAUG's DL4 (BANNER.HEX)
- Berkeley MUG (Disk #3)
- Club Mac BBS (BANNER.APL)

Rolodex
- Berkeley MUG (Disk #1)
- NYMUG (Disk #3)
- Club Mac BBS (ROLODX.APL)

File 1.0
- Friends

File 1.UTAH
- MAUG's DL4 (UTAHF1.HEX)
- NYMUG (Disk #7)
- Club Mac BBS (UTAH.APL)

Edit
- MAUG's DL5 (EDITOR.HCX)
- Berkeley MUG (Disk #10: MDS Edit)
- Club Mac BBS (NEWEDT.APL)

MacTEP 1.81m
- Friends

AutoTEP.vs2
- MAUG's DL8 (MAUGTE, MAUGTE.NOT)

Auto MacTEP Mouse 1.87
- MAUG's DL8 (AUTOTE.187)

TEP Plus
- MAUG's DL8 (TEP, TEPFIX.TXT, TEPHLP.BAS)

RLMTEP 3.0
- MAUG's DL8 (RLMTEP.302, RLMTEP.303, RLMTEP.111)

Pretty Good Terminal
- Club Mac Member Disk
- Club Mac BBS (PGTERM.APL and PGTERM.DOC)

Red Ryder 4.0
- MAUG's DL8 (RYDER.HQX, RRDOC1.HQX, RR1DOC.HQX, RR2DOC.HQX, RR3DOC.HQX)

Menu Editor
- MAUG's DL5 (MENUED.HCX)
- Berkeley MUG (Disk #10)

Font Editor
- MAUG's DL5 (FONTED.HEX)
- Berkeley MUG (Disk #6)
- NYMUG (Disk #5)

SetFile
- Berkeley MUG (Disk #6)

RMover
- MAUG's DL5 (RMOVER.HEX)
- Berkeley MUG (Disk #6)

Resource Editor
- MAUG's DL5 (REDIT.HCX)
- Berkeley MUG (Disk #10)
- Club Mac BBS (name not assigned at press time)

Desk Accessory Mover
Send a disk and a self-addressed mailer to:
C.E. Software
801 73rd Street
Des Moines, IA 50312
(515) 224-1995; or:
- MAUG's DL4 (DAM.V14)
- Berkeley MUG (Disk #10)
- NYMUG (Disk #6)
- Club Mac BBS (DAMV14.UTL)

Ramdisk
- MAUG's DL4 (RAMDISK.HCX and RAMDIS.DOC)
- Berkeley MUG (Disk #3)

Note: The sources mentioned are provided to help you locate the software—they are not by any means the only places you can find these programs.

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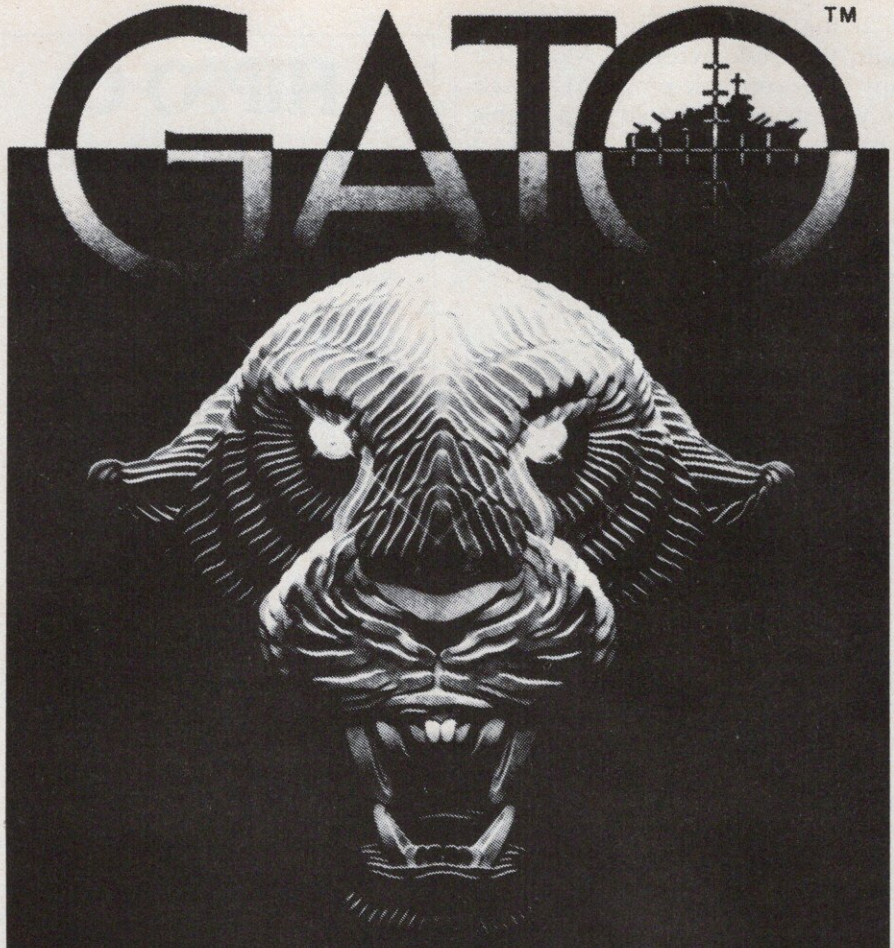
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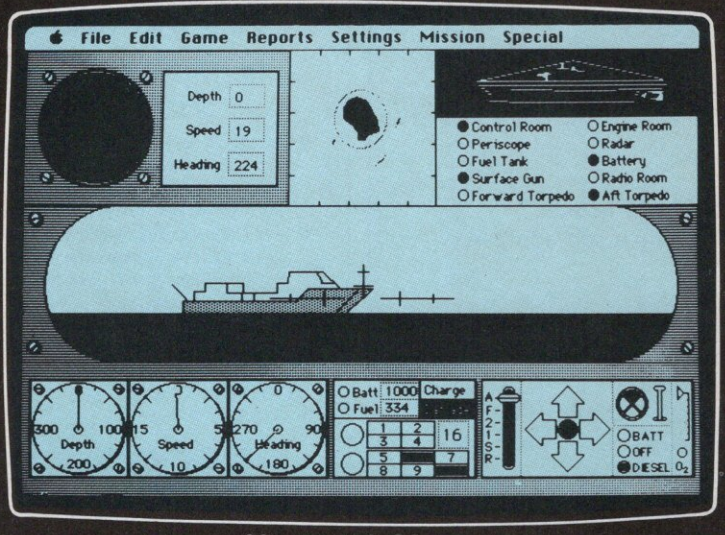
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RAMdisk of only one size (320K), and you must alter your System file with RMover (or the new Resource Editor) in order to run it, so it is considerably less versatile than Mac Memory Disk from Assimilation Process, which is a well-designed commercial RAMdisk program.

If you are unsure about whether or not RAMdisks are for you, though, experimenting with Ramdisk for a while may resolve your uncertainty—at which point you can go out and buy Mac Memory Disk. (For more information about Mac Memory Disk see "Mac Memory Disk Makes a Fat Mac Fast" in the March 1985 issue of *A+*, pages 86–91.)

Desk accessories you can install with Desk Accessory Mover, fonts, games, graphics for use with MacPaint, files for commercial programs such as Multiplan and Filevision, public-domain versions of Forth and Lisp, and more are in store for you in the second part of this article. ✚

Robert Eckhardt recently resigned as Vice President of Simon & Schuster's Electronic Publishing Group to devote more time to reading, writing, and being outdoors.

Macintosh Aficionados

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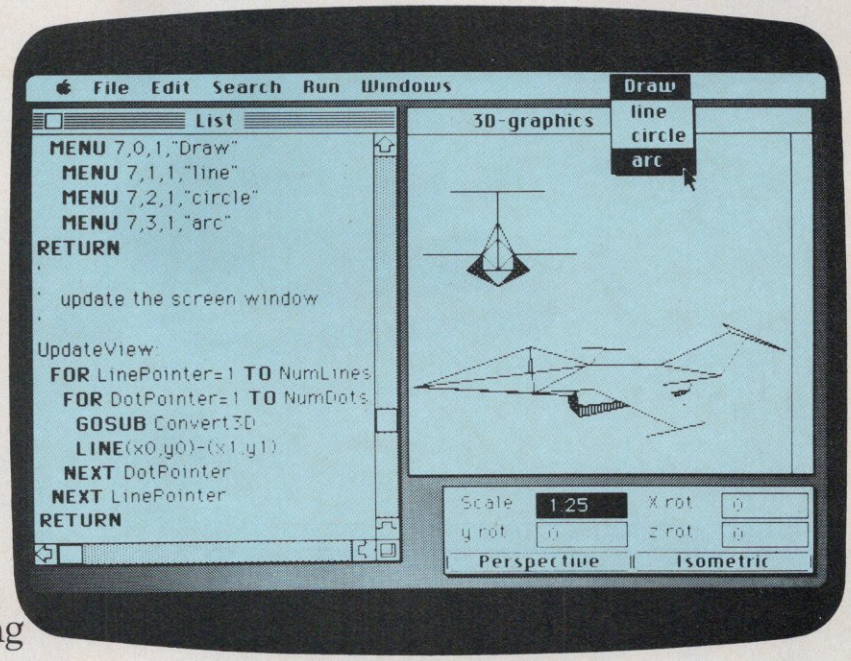
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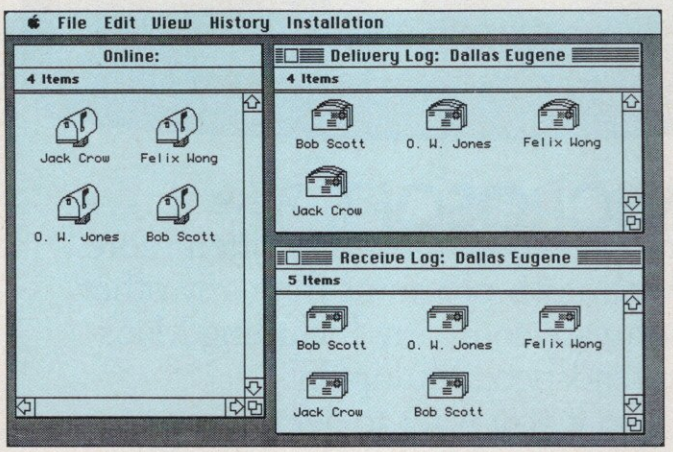
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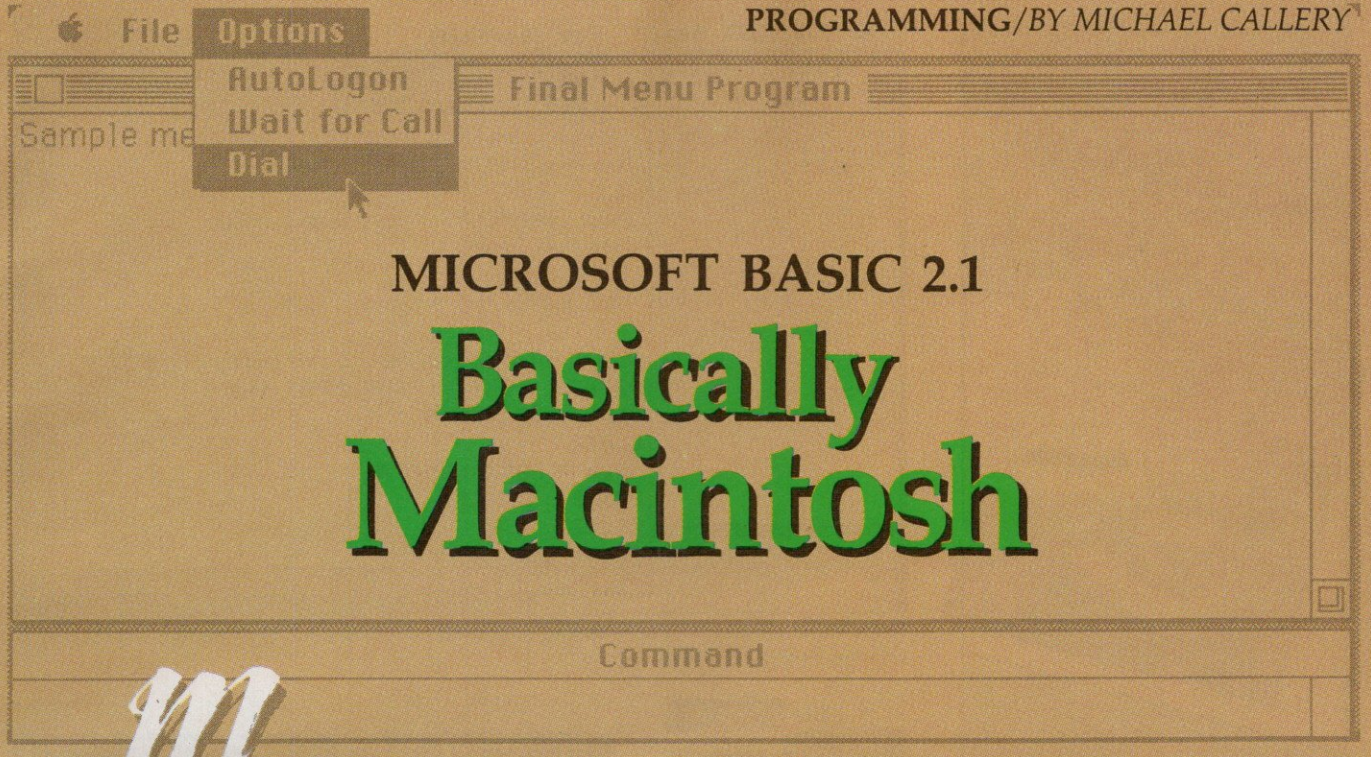
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MICROSOFT BASIC 2.1

Basically Macintosh

Many people used to believe that if you owned a personal computer, you had to know how to program it, but that belief is no longer valid. The multitude of off-the-shelf software allows you to use computers without having knowledge of programming languages.

The Apple II, the IBM Personal Computer, and most other popular microcomputers have a version of the BASIC programming language built into the computer's permanent memory. Thus, industry observers were surprised when Apple released the Mac without a built-in language. Apple had designed the Mac for nontechnical users.

So why would anyone want to program "the computer for the rest of us"? For one, programming is an unparalleled intellectual pursuit. The process of writing a program is a good, solid problem-solving exercise. When the bugs have been squashed and the program runs, the sense of achievement is real. Your program may also help you solve a problem or increase your productivity. Whether you program for intellectual stimulation or to create useful tools, you'll also learn a lot about the Mac.

Microsoft BASIC 2.1 for the Macintosh (MS-BASIC), which is an identical but speedier version of MS-BASIC 2.0, does allow you to use programs created with the more-primitive version 1.0. It includes a rich set of instructions to let you tap the power of Apple's custom software contained in the Macintosh ROM toolbox. It enables you to produce BASIC programs that take advantage of menu bars, alert boxes, edit boxes, and so on—all from your programs, all in BASIC. MS-BASIC 1.0 or 2.0 owners who want to upgrade to version 2.1 can do so for $50.

Programming is an unparalleled intellectual pursuit. When the bugs have been squashed and the program runs, the sense of achievement is real.

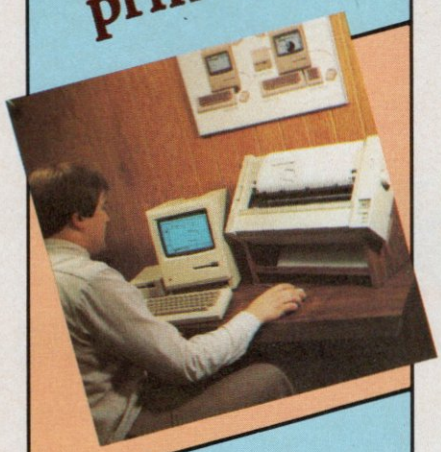
The Macintosh screen in Microsoft BASIC is divided into several windows, each with a different function. You write and view programs in the List window, look at output in the Output window or windows, and enter commands or individual program lines in the Command window. You can size, move, and close the windows with the mouse. (Figure 1 shows a typical screen during programming.)

You enter program lines in the List window. Unlike Microsoft BASIC on other computers, Mac MS-BASIC 2.1 allows, but does not require, line numbers. It executes program lines in order of their occurrence in the List window. To move a line to another location, you can use the Mac's Cut and Paste functions. The clipboard is fully functional and allows you to move blocks of code from one program to another or to move pictures into MS-BASIC.

MS-BASIC creates a primary Output window for text and graphics. The window bears the title of the program or is labeled "Untitled" if you haven't saved the program yet. Output is displayed only temporarily within the window. That is, if you open the List window and then close it, the text or graphics beneath the List window will be erased. You can open up to four output windows, but only one can be active at a time.

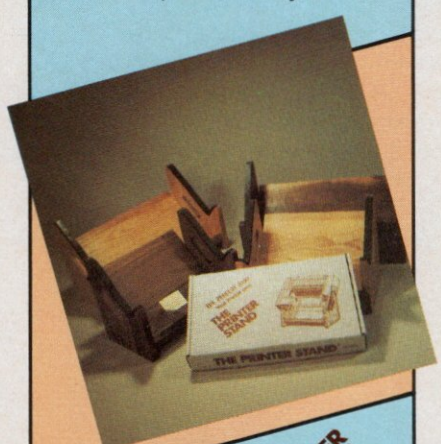
The primary use of the Command window is as a place to type a quick TRON (TRace ON) or to print the value of a variable. You can issue most commands—Save, Load, List, Find, Stop, Run, and so on—most efficiently by using a ⌘-key sequence or the menu bar. The MS-BASIC 2.1 menu bar also includes options that display the Command, List, or Output window.

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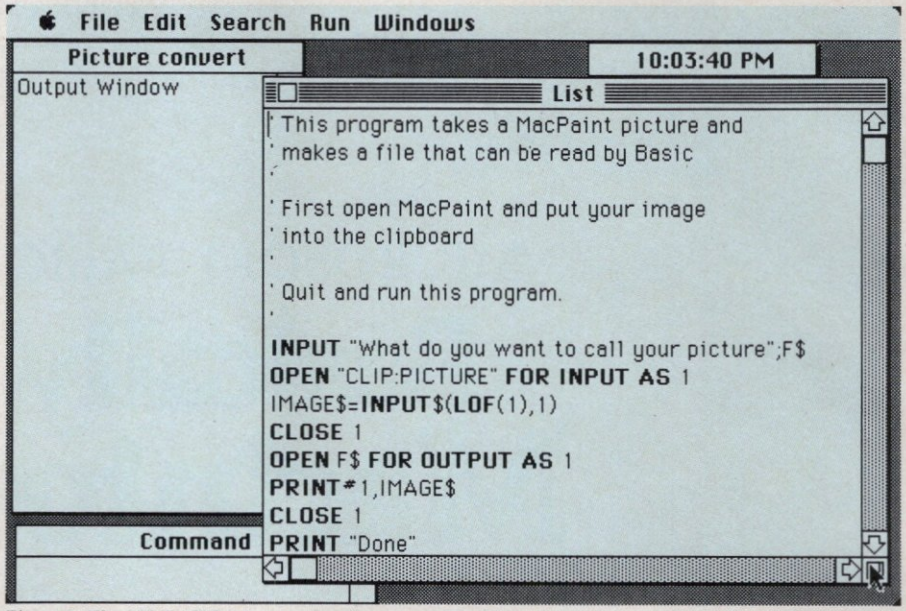


Figure 1: The MS-BASIC 2.1 programming screen. The List window is currently active, and the clock is the usual desktop accessory.

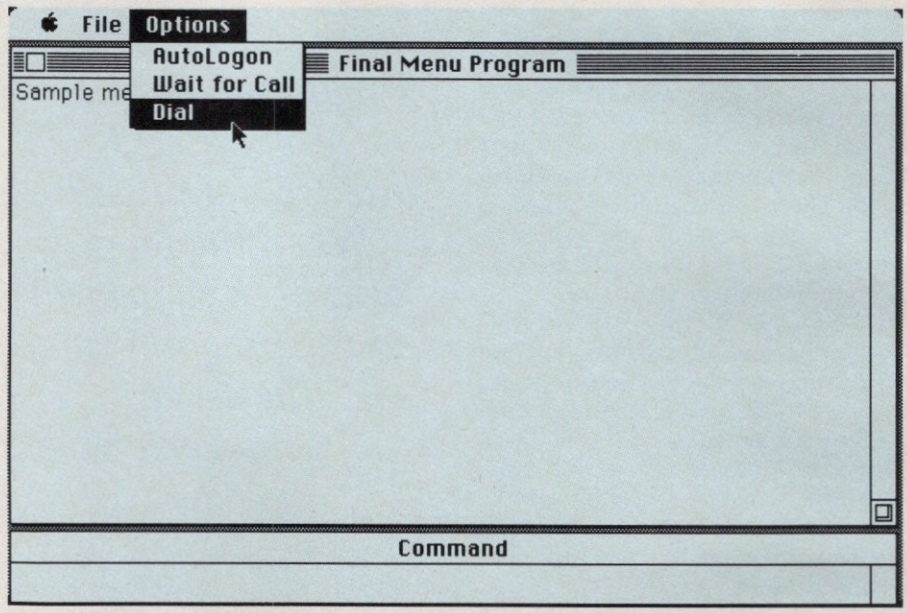


Figure 2: The output of the menu program with the Options menu pulled down. A dialing function has not been provided in the program.

MS-BASIC is a much-evolved version of the original Microsoft BASIC, distantly related to Applesoft BASIC. MS-BASIC for the Mac has improved control structures with IF/THEN/ELSE and WHILE/WEND, input with LINE INPUT, and output with PRINT USING. I/O is "device-independent," which simplifies programming for devices other than the screen or disk drive. PSET, PRESET, LINE, CIRCLE, PUT, and GET instructions all support graphics.

If you have never programmed or if the preceding language features are only so much jargon, suffice it to say that these features make MS-BASIC for the Mac simpler than Applesoft to learn. The most exciting part of this MS-BASIC, however, is the wide selection of instructions that enable you to tap into the Macintosh-toolbox software resources such as menus, dialog boxes, mouse functions, and QuickDraw graphics routines.

The following sample programs might be useful as subroutines in a simple terminal program, but they would need revision if you were to incorporate them into an actual terminal program. The first example shows you how to create a custom menu bar.

Making Menus

Most Macintosh applications should use a menu bar for the primary program commands. You pull

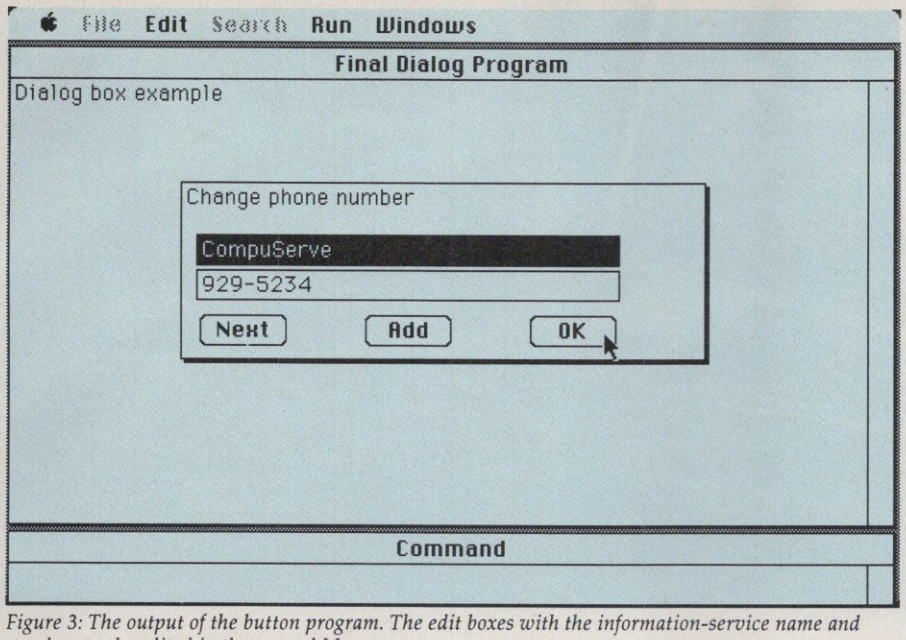


Figure 3: The output of the button program. The edit boxes with the information-service name and number can be edited in the normal Mac manner.

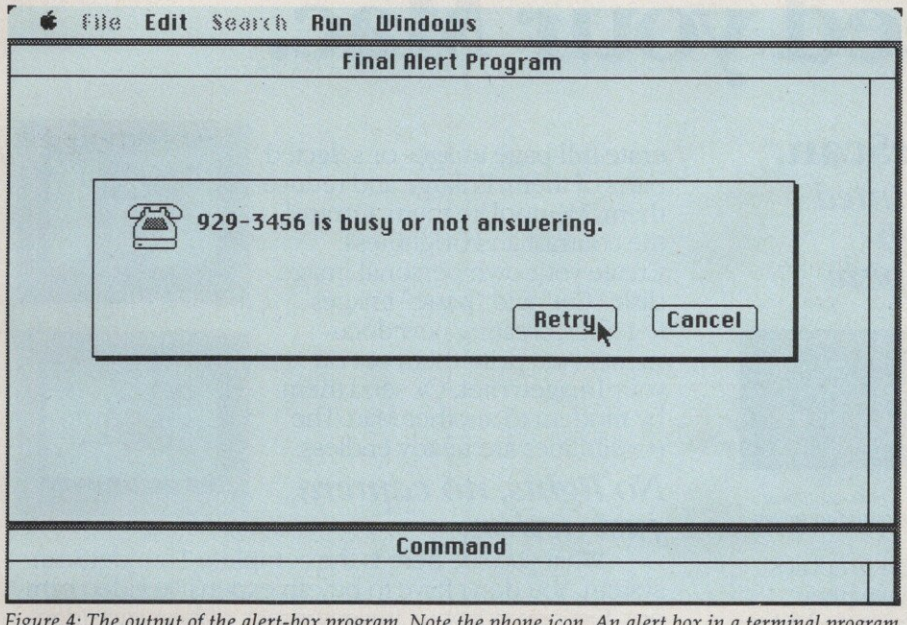


Figure 4: The output of the alert-box program. Note the phone icon. An alert box in a terminal program will tell you if the number you just called is not answering or is busy.

down the menu and select the command.

In MS-BASIC 2.1, you can create custom menu bars with the MENU statement, and you use the MENU function to specify items to be listed in each menu bar.

Here's a program that puts a sample menu on the screen for an imaginary terminal program (see figure 2 for output).

Program 1

```
' menu example
CLS
PRINT "Sample menu"
' erase normal menu
FOR i = 3 TO 5: MENU i,0,0,"": NEXT i
' put up new menus
' in locations 1 and 2 on menu bar
MENU 1,0,1,"File"
MENU 1,1,1,"Send"
MENU 1,2,1,"Save"
MENU 1,3,1,"Quit"
MENU 2,0,1,"Options"
MENU 2,1,1,"AutoLogon"
MENU 2,2,1,"Wait for Call"
MENU 2,3,1,"Dial"

' setup event queue notification
ON MENU GOSUB Menucheck:MENU ON

' do nothing until menu is selected
idle: GOTO idle
```


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```
Menucheck:
IF MENU(0)=1 THEN ON MENU(1) GOSUB
                  sendfile,savefile,done
IF MENU(0)=2 THEN ON MENU(1) GOSUB
                  autolog,callwait,dial
RETURN

' subroutines to handle menu selections
sendfile: F$=FILES$(1,"TEXT"): RETURN
savefile: F$=FILES$(0,"Name to save?"):
RETURN
done: MENU RESET: END
autolog: RETURN
callwait: RETURN
dial: RETURN
```

Note that I've named the subroutines with labels such as sendfile and autolog, rather than using line numbers. We don't have the space to detail the syntax of the instructions in this listing, but you can see how simply the MENU statement creates new menus. The arguments of the MENU statement specify where the menu will be located, its activity state, and the commands that should appear. The MENU function is equally easy to use to determine which item was selected.

The program will do nothing (i.e., it will idle) until you've made a selection. The MENU ON statement turns on "menu event trapping." When you've made a menu selection, the MENU function, MENU(0) returns the menu that you selected (0 through 20), and MENU(1) returns the item within that menu.

Mac-toolbox ROM routines take care of displaying the menu and handling all the menu functions. You have to include the activity that is supposed to occur after a menu selection in your program code, however.

Sendfile and Savefile

I've included two other Mac-toolbox routines in this program. The Sendfile and Savefile subroutines use the FILES$ function. These subroutines, as I have used them here, store a filename in the variable F$.

The FILES$ function in the Sendfile subroutine displays the filenames in a window, with all of the usual accoutrements: a Cancel button, an Eject button, working scroll bars, and even the ability to double-click on a selected file. The FILES$ function in the Savefile subroutine puts an edit

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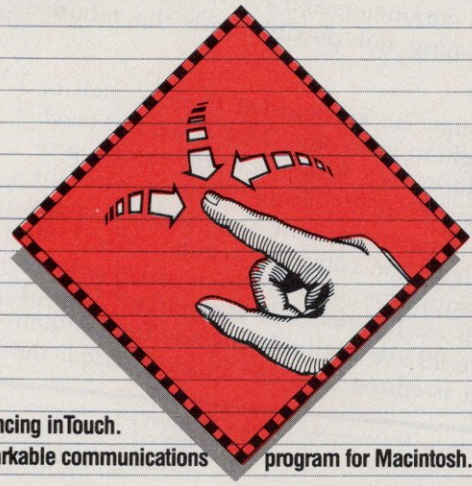
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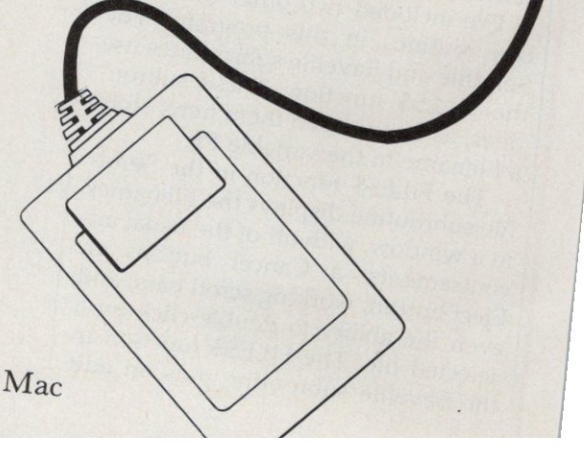
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box on the screen along with the usual Macintosh editing features. The first argument determines the action, a 0 produces the dialog box that lets you select and open files, and a 1 produces an edit box.

Having a Dialog

Dialog boxes are another commonly used Mac feature. The sample terminal program that follows might include them in order to provide phone numbers for different information services (see figure 3 for output).

Program 2

```
' dialog box example
PRINT "Dialog box example"
' read stored names
' a real program would probably use a file
nnum=4
FOR j = 1 TO nnum
  READ Na$(j),Nu$(j)
NEXT:j=1
DATA CompuServe,929-5234
DATA The Source,925-8434
DATA Dow Jones,342-4534
DATA Delphi,834-2233

' create dialog window with buttons
WINDOW 2,,(100,100)-(400,200),-4
PRINT "Change phone number"
BUTTON 1,1,"Next",(10,75)-(60,93)
BUTTON 2,1,"Add",(105,75)-(155,93)
BUTTON 3,1,"OK",(200,75)-(250,93)

' idle loop using polling
start:
EDIT FIELD 2,Nu$(j),(10,50)-(250,65)
EDIT FIELD 1,Na$(j),(10,30)-(250,45)
i=1
idle:
  d = DIALOG(0)
  IF d=1 THEN GOTO handlebuttons
  IF d=2 THEN i=DIALOG(2):EDIT FIELD i
  IF d=6 THEN IF j=nnum THEN GOTO done
                        ELSE nextnumber
  IF d=7 THEN i = (1 MOD 2)+1:EDIT FIELD i
  IF i=1 THEN Na$(j)=EDIT$(1)
                    ELSE Nu$(j)=EDIT$(2)
  GOTO idle
' subroutines to handle button selections
handlebuttons:
   ON DIALOG(1) GOTO
nextnumber,newnumber,quit
RETURN
newnumber: nnum=nnum+1: j=nnum:
           GOTO start
nextnumber: j=j+1: IF j>nnum THEN j=1
           GOTO start
quit: WINDOW CLOSE 2:WINDOW 1: END
```


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Unlike in the previous example, this program actively checks the status of the buttons with the idle loop, using a technique called polling. Like the menu program, this example uses the EDIT$ function. It displays the names and phone numbers stored in Na$() and Nu$() and lets you add a new name and phone number.

The BUTTON statements prior to the idle loop create three buttons in the dialog window. Arguments to the Button statement give the buttons' numbers, activity states, titles, size, and location.

The DIALOG(0) function informs the program of the type of dialog event that occurred—button, edit field, go-away box, and so on—and has the purpose here of handling the edit fields as well as the buttons. If someone clicks on a button, the program carries out the selected action. The DIALOG(1) function returns the number of the button that was pressed. Although MS-BASIC (and the Macintosh) take care of flashing the buttons, your program must make the buttons work. Thus, each button has an associated subroutine to effect the action of the button.

The WINDOW statement creates a new window, window 2, in which the dialog occurs. If you press the Cancel button, the program branches to the Quit subroutine, which closes the dialog window—releasing the memory required to maintain it—and reverts to the normal Output window (window 1) before ending. If you don't close windows that you've made, the Mac will resolutely maintain them, even though you are no longer running the program.

On the Alert

The final example I'll present is an alert box (see figure 4 for output). Alert boxes warn you about certain conditions. For example, you need an alert box in a terminal program to tell you that the number you have just called is not answering or is busy.

```
Program 3

' Alert Box Example
' dummy phone number
Nu$(i)="929-3456"

' get icon from file
OPEN "phoneicon" FOR INPUT AS 1
Icon$=INPUT$(LOF(1),1)
CLOSE 1
' create window with icon, text,
```


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```
' and buttons
WINDOW 2,,(50,100)-(450,200),4
PICTURE (10,10),Icon$
LOCATE 2,8:TEXTFONT(0)
PRINT Nu$(i);"is busy or not answering."
BUTTON 1,1,"Retry",(240,70)-(300,87)
BUTTON 2,1,"Cancel",(320,70)-(380,87)

' set up dialog event trapping
DIALOG ON
ON DIALOG GOSUB checkbutton
idle: GOTO idle

' handle dialog events
' can be buttons only
checkbutton:
IF DIALOG(0)<>1 THEN RETURN
ON DIALOG(1) GOSUB redial,quit
RETURN

' subroutines to handle buttons
redial:
LOCATE 2,8:TEXTFONT(0)
PRINT "Dialing ... ";Nu$(i);"
GOSUB dial
RETURN

dial:
' substitute dial code here
FOR t= 1 TO 1000:NEXT t
LOCATE 2,8:TEXTFONT(0)
PRINT Nu$(i);"is busy or not answering."
RETURN

quit: WINDOW CLOSE 2: WINDOW 1: END
```

This program uses event trapping, as the menu example does, but it acts only on button events, when DIALOG(0)=1. Although MS-BASIC does not directly support icons, this program displays one. I created it in MacPaint and transferred it to BASIC by using a file and the PICTURE$ instruction.

PICTURE$ converts a MacPaint image into a form that a BASIC program can use. A fully functional program for taking an image from the clipboard, translating it to a string, and writing it to a file appears in the List window of figure 1.

For the alert box, I borrowed the phone icon from MacTerminal. First, I captured the MacTerminal icon in the Finder with ⌘Shift-3; opened MacPaint; read in SCREEN0; captured the phone icon on the clipboard; quit MacPaint; and, finally, ran the program in figure 1.

To use the icon in the alert box, this program first reads the phone-icon file, assigning the contents of the "phone-icon" file to the variable Icon$. Once the program has defined Icon$, you can use the PICTURE command to create the icon.

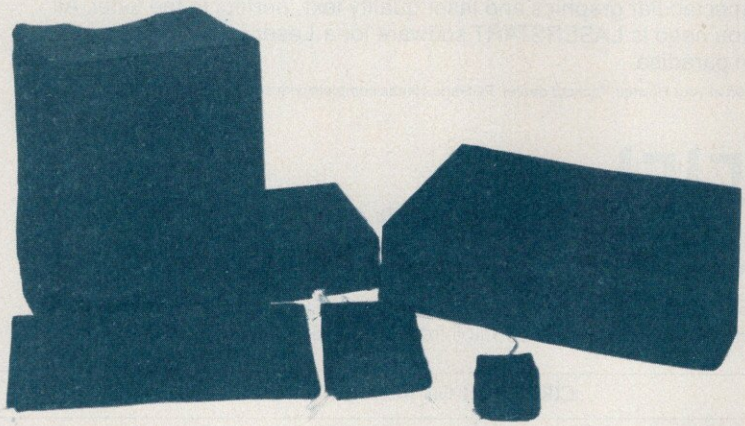
These few examples should give you some notion of how powerful Microsoft MS-BASIC version 2.1 for the Mac is. MS-BASIC also includes many other features that enable BASIC programmers to create programs that not only are useful or fun but also fully utilize the Macintosh's many unique features. ✚

Michael Callery teaches computer graphics at the New School in New York and creates instructional software. He is the author of Commodore Magic *(E.F. Dutton) and the coauthor of a book on Apple graphics coming soon from Prentice-Hall.*

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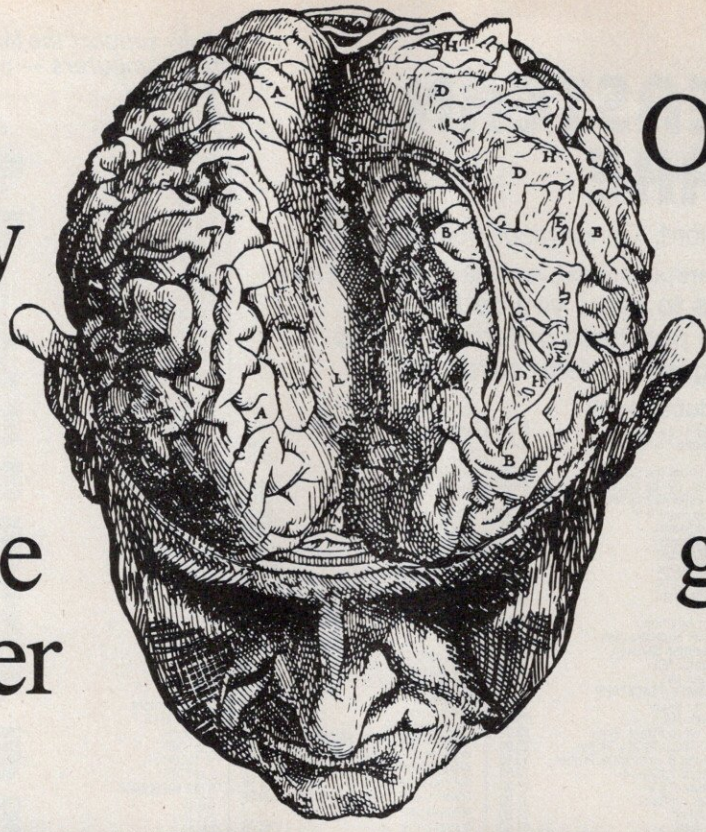
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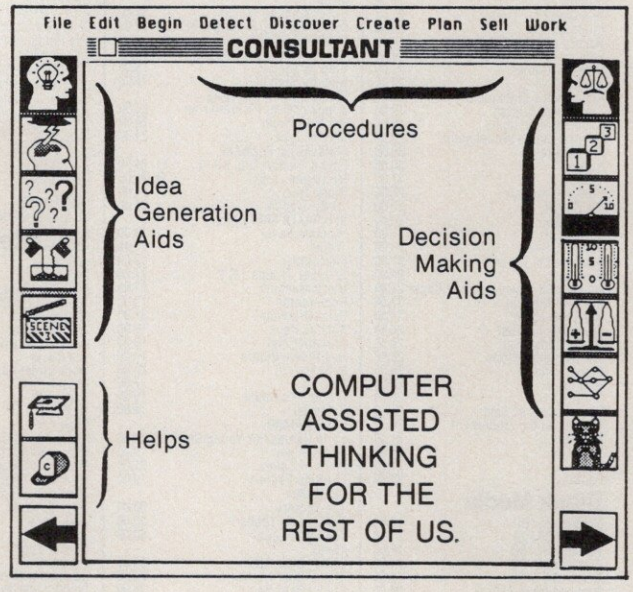
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CIRCLE 327 ON READER SERVICE CARD

A LOOK AT THE NEW Finder and MacForth

And an annotated chart of Macintosh programming languages

With much regret, I must announce that this is the last of my "Mac According to Hogan" columns.

Simply put, I find I don't have enough time to research and write the kind of quality material I think Macintosh users need. To all the readers who have written to me to thank me for things I've said in my column, thank you, and may your further Macintosh journeys be rewarding.

For this final column, we have two programs I think you should know more about, the new version of the Mac Finder and MacForth Level 2.

Finder's Keepers

This summer looks like a busy one for Apple, at least as far as software is concerned. At long last, we'll see MacDraw, MacBASIC, and the development system, and new versions of the Finder and MacWrite will also be available. For good measure, there's Andy Hertzfeld's Switcher program, which allows multiple programs in memory simultaneously (if you've got the memory—512K or more). From what I've seen in each of these programs and updates as they near final release, I can come up with only one comment: It's about time.



Figure 1: The Finder's new Shut Down command

The new Finder we've seen is version 4.1, and it is significantly improved in several respects. You can now shut down the system (i.e. save all folders and eject all diskettes) in less time by choosing the new Shut Down command from the Special menu (see figure 1). It takes only three seconds, by my count.

Loading files and moving from application to application is also faster. Hard-disk support has been improved, and the Finder can now work better with many files in a single directory.

Included in the version of the new Finder I saw was something called the miniFinder. It is a simplified program-selection system that can move you around more quickly but still makes use of some of the Macintosh graphic abilities (see figure 2 for a typical miniFinder display that I set up on one of my utility disks). Getting to the miniFinder is faster when you're booting than waiting for the whole Finder to take charge. The miniFinder looks like a nice enhancement that I'll make use of on my development-tool disks.

Also new in the Finder are some additional items in the File menu. You'll find that New Folder, Page Setup, and Print Catalog have been added to this menu. New Folder creates a new, empty folder; the new Finder no longer requires that an empty folder be on every disk even if you'll never use it (just one more thing to clutter

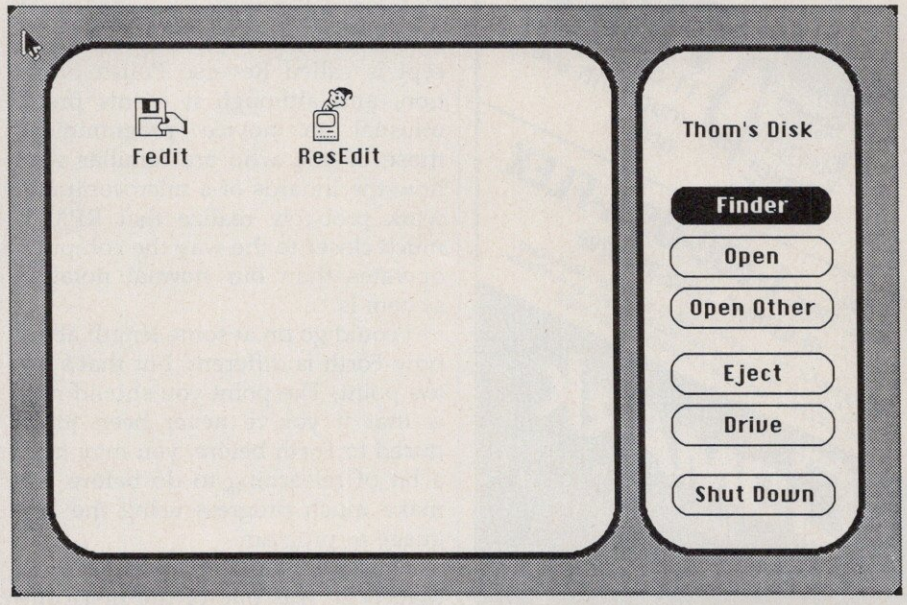


Figure 2: A typical miniFinder display

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up the display). Page Setup does the usual printer-driver-setup things, and Print Catalog does in the Finder what Print Catalog does in MacPaint: It prints a catalog of the indicated disk, complete with icons and filenames.

One thing that does not show on the display but certainly shows when you're using the new Finder is that on a 512K Macintosh, all those resources that the Finder used to swap in and out of memory are now stuck into memory automatically by the Finder. No more waiting patiently for some of those dialog boxes, controls, or font changes, at least for us 512K owners.

All in all, even though the changes in the Finder don't seem major, Apple has done a good bit of reworking, and the subtle changes will make life more bearable on the desktop.

As they once said on British television: "And now for something completely different." Forth is about as different a computer language as you'll find.

In Forth, you can program interactively by typing commands and getting immediate response (interpreted languages work this way), or you can type lines of program code, using an editor, and then have the language prepare and execute your code all at once (a process that is similar to compiling).

To perform math functions in Forth, you don't tell it things like 2 + 2 (which equals 4) but instead tell it 2 2 + (which still equals 4). This concept is called Reverse Polish Notation, and although it seems pretty unusual to novice programmers, those of you who are familiar with how the innards of a microcomputer work probably realize that RPN is much closer to the way the computer operates than our normal notation system is.

I could go on at some length about how Forth is different, but that's not the point. The point you should note is that if you've never been introduced to Forth before, you may have a bit of relearning to do before you make much progress using the language to program.

Creative Solutions, the maker of MacForth, was one of the first companies to provide any programming tools for the Mac, let alone high-quality ones. At the 1984 West Coast Computer Faire (about two months after the Mac's introduction), the firm introduced Level 1 MacForth.

Level 1 MacForth is a complete version of Forth that, Creative Solutions says, is suited for hobbyists as well as people who are just beginning to learn to program the Macintosh. Besides the usual things you expect to find in Forth, Level 1 includes some rudimentary graphics routines (rectangles, ovals, arcs, wedges, and rounded rectangles, among others) and access to the most useful toolbox routines. Level 2, which was released a month or two later, is geared toward professionals and includes some advanced graphics routines (polygons, regions, pictures), some floating-point-number routines (not usually available in basic versions of Forth) support for in-line assembly language, and the rest of the toolbox routines necessary to program the Macintosh's every bell and whistle.

A third level is available for those who want to turn their MacForth programs into commercial applications that hide Forth (other than including a message that the programming language was MacForth). You don't have to pay royalties to Creative Solutions if you use Level 3 Forth to create a product, although you will have to include some information about MacForth in your product in return for the no-royalty policy.

You can buy any level of MacForth and upgrade later to a higher level for the difference in price (Level 1 is $149, Level 2 $249, and Level 3 $499). Personally, I think that Level 2 is almost a necessity for doing any serious programming, since you won't be able to do some basic things such as using TextEdit or any controls with Level 1. Nevertheless, Creative Solutions' upgrade policy makes it easy to test the waters, so to speak.

And nice waters they are. MacForth comes with a simple tutorial, Going Forth, that will get you past that first, shy, stage most of us have when we're trying to learn something new on our computers. I found the tutorial good but wished there had been more to it. Also included are a few sample programs, mostly in the form of simple graphics demonstrations. Listing (and editing) them will show you just how easy it is to program the Macintosh.

Here's the code you use to create a

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IT WAS HER EYES...



. . . that tipped me off. They looked out through the fancy fur and perfume and told me something was wrong, dead wrong. I'd seen those eyes somewhere, in some long forgotten place, some dingy nightclub on the south side of Chicago. But here she was, strictly East Side Manhattan, if you catch my drift.

She was askin' me to stick my neck out for the long green, but a nasty feeling made me think twice before I made my move. I had to put those eyes to a face, and fast. The solution was on my desk: MAC PRIVATE EYE.™ One quick call to my inside man at headquarters was all it took. Within seconds he copied the mug shot with his MAC PRIVATE EYE video digitizer, modemed it straight to my Macintosh,™ and put the I.D. on this dame. The $595.00 I spent on that MAC PRIVATE EYE probably saved this flatfoot from some serious trouble. One thing WAS clear, my MAC PRIVATE EYE would never leave me short for important information like maps, graphs, blueprints, photos, security I.D.'s, and a thousand other things I hadn't thought of yet. There was only one question; how did I ever get along without it?

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new window, for instance:

```
(New Window Setup)
NEW WINDOW SHEET
  "My Window"        SHEET W.TITLE
  10 10 200 200      SHEET W.BOUNDS
  SIZE BOX CLOSE BOX +
                     SHEET W.ATTRIBUTES
  SYS WINDOW         SHEET W.BEHIND
SHEET ADD WINDOW
```

SHEET in the above example is simply a pointer to our window definition. Most of the rest of this simple example should be self-explanatory if you've read *Inside Macintosh*.

Other Macintosh-toolkit goodies are just as easy to use. Indeed, one of the aspects I like about Forth as a learning language for potential Macintosh programmers is that you can try things out interactively, watching what happens at each step.

The editor that comes with MacForth works pretty much like MacWrite does, except that it scrolls one Forth block (16 lines of code) at a time. Forth programmers are used to working in blocks, so they won't be put off by not having continuously-scrolling text entry, but I, having been raised primarily in the Pascal realm of languages, would have appreciated not always having to think in blocks of 16 lines.

The editor includes the ability to date-stamp the file you're editing and manipulate whole blocks at a time (as in erasing a block for reuse). Invoking the editor from Forth is as simple as typing the block number you want to edit and the word EDIT—10 EDIT, for instance.

Again, note that Forth wants you to specify the numbers it is to work with before you tell it what to do with those numbers (more RPN).

Two things distinguish MacForth from many of the other languages

AN APPRAISAL OF

COMPANY	PRODUCT	COMMENT	RS NO.
Absoft Corporation 4268 North Woodward Royal Oak, MI 48072 (313) 549-7111	MacFORTRAN	*Full ANSI FORTRAN 77 compiler with debugger. Full toolbox interface.*	395
Apple Computer, Inc. 20525 Mariani Avenue Cupertino, CA 95014 (408) 996-1010	Macintosh Pascal Mac BASIC Development System Assembler	*Good learning language.* *Not very BASIClike, but almost a pseudo-Pascal; I'd recommend MacPascal instead.* ***The** assembler system.*	396
Consulair Corporation 140 Campo Drive Portola Valley, CA 94025 (415) 851-3849	Mac C Compiler	*Very good, as far as it goes; integrates well with MDS assembler.*	397
Creative Solutions 4801 Randolph Road Rockville, MD 20852 (301) 984-0262	MacForth Level 1 MacForth Level 2 MacForth Level 3	*Excellent all-around.*	398
ExperTelligence 559 San Ysidro Santa Barbara, CA 93108 (805) 969-7874	ExperLogo ExperLisp ExperOPS5	*A powerful extension of the Logo computer language.* *The first complete implementation of LISP on a microcomputer.* *Complete implementation of OP5 expert-systems building tool.*	399
Hippopotamus Software 985 University Avenue Los Gatos, CA 95030 (408) 730-2601	Hippo-C Level 1 Hippo-C Level 2	*Good for newcomers to C.*	400
Kriya Systems, Inc. 505 N. Lake Shore Drive Chicago, IL 60611 (312) 822-0624	Neon	*A Smalltalk-like environment that offers an object-oriented language, with execution speed of Forth.*	401
MainStay Software 28611B Canwood Street Agoura Hills, CA 91301 (818) 991-6546	MacASM (assembler)	*First assembler available for Mac, but I haven't tested.*	402

available for the Macintosh. First, the manuals, both for Level 1 and Level 2, are clear, explain Macintosh programming rules much better than any others I've seen, and are well indexed and cross-referenced. Even though the MacForth manuals do not try to teach you Forth, the Level 2 manuals total more than 500 pages. I could not find any undocumented (or even poorly documented) commands, and, again, the indexing is complete and accurate.

Second, MacForth is supported by a special users' network on CompuServe (GO PS64 is the command to get to it). You use a supplied program, Terminal, written in MacForth, to call CompuServe. Once you've joined the special-interest group serving MacForth, you'll have access to lots (and I mean lots) of sample source code, discussions of problems encountered and how to get around them, plus general chitchat with other MacForth users. In addition, you can pose questions to Creative Solutions personnel who monitor the bulletin board.

I know of no other language for the Macintosh computer that is as fully developed and well explained and comes with such complete support. If you're serious about programming the Mac, you owe it to yourself to look at MacForth.

Roundup Time

Since this is the last column, I thought it appropriate to include a roundup of the languages that are available for the Macintosh, which you'll find in the accompanying annotated chart. ✚

Thom Hogan is the editor-in-chief of Business Software *and is the author of numerous computer books, including* InfoWorld's Essential Guide to the Apple II.

MACINTOSH LANGUAGES

COMPANY	PRODUCT	COMMENT	RS NO.
Manx Software Systems P.O. Box 55 Shrewsbury, NJ 07701 (800) 221-0440	Aztec C68K	*Reportedly fast, but doesn't use Mac interface when compiling.*	403
Megamax, Inc. Box 851521 Richardson, TX 75085 (214) 987-4931	C Compiler	*Just received. Appears to be faster than all but Manx, and includes some things that Consulair does not.*	404
Microsoft Box 97200 Bellevue, WA 98009 (206) 828-8080	Microsoft BASIC 2.1	*Good standard BASIC with decent access to many Mac features.*	405
Modula Corporation 1673 West 820 North Provo, UT 84601 (800) 545-4842	Modula 2	*For serious Pascal programmers, here's a language that will take you beyond what MacPascal or Lisa Pascal can do.*	406
Pterodactyl Software 200 Bolinas Road #27 Fairfax, CA 94930 (415) 485-0714	PC BASIC Compiler	*A BASIC compiler for the LISA (Mac XL), under the Pascal workshop, compatible with IBM PC BASIC.*	407
Softech Microsystems 16875 West Bernardo Drive San Diego, CA 92127 (619) 451-1230	MacAdvantage UCSD Pascal	*Entry-level Pascal with development tools and utilities.*	408
	UCSD Pascal	*Full-scale development system.*	
	FORTRAN 77	*A complete implementation of the 1977 ANSI version of FORTRAN.*	
Softworks Ltd. 2944 North Broadway Chicago, IL 60657 (312) 975-4030	SW Professional C Compiler	*Whitesmith's C for the Mac. I like it a little less than the Consulair version, but it's still worth looking at.*	409

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The Mac has incredible graphics and memory. Some of our games take up as much as 1 million bytes, include dazzling graphics and sound, and will give your Macintosh a run for it's money. We also produce a fine line of business packages and graphics utilities.

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This is the first of our series of practical business application programs, inspired by requests of our Midwest users. It includes a wealth of information on agriculture, animal husbandry, and farming. It also has an inventory control package and more information on AGRINET, our online information service on current meat and grain prices. We have received enormous support already for this package but still could use a lot more information. If you are currently involved in this industry and would care to share your know- ledge, we would be pleased to hear from you in writing or by phone.
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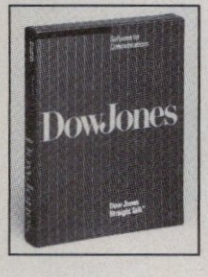
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A+ pipeline

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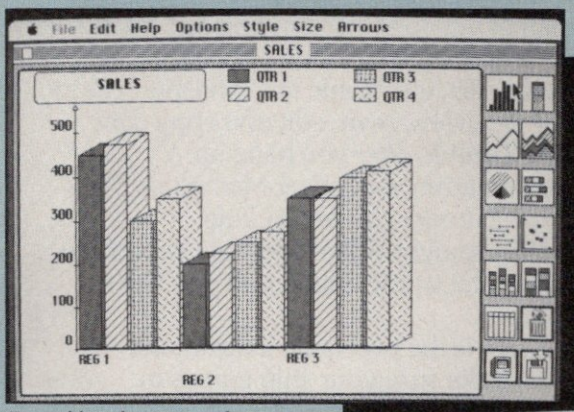
Systems now available are General Ledger, Accounts Payable, Accounts Receivable, Inventory Control, and the System Manager. Each system can be used alone or can be integrated with the General Ledger. The only required system is the System Manager, which includes a mailing-labels program.

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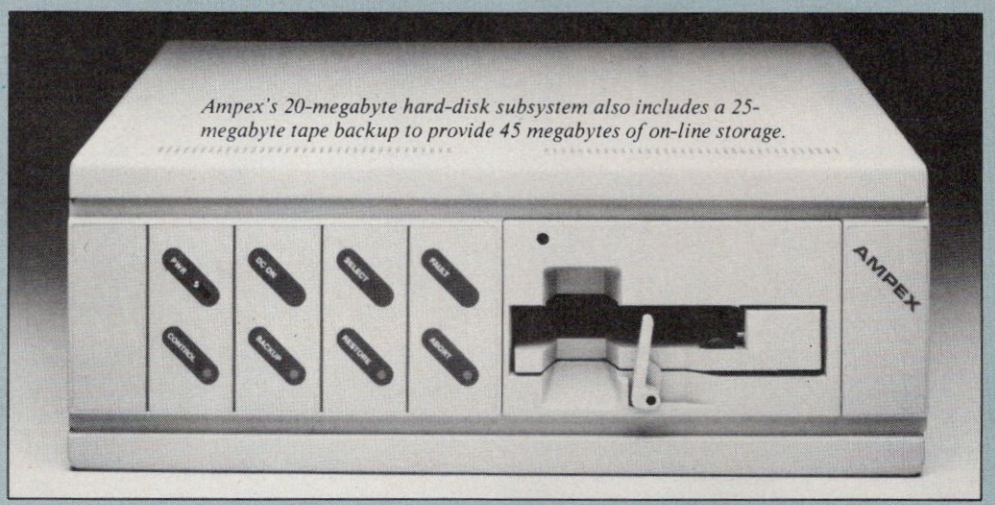
Requires: Apple IIe or IIc,



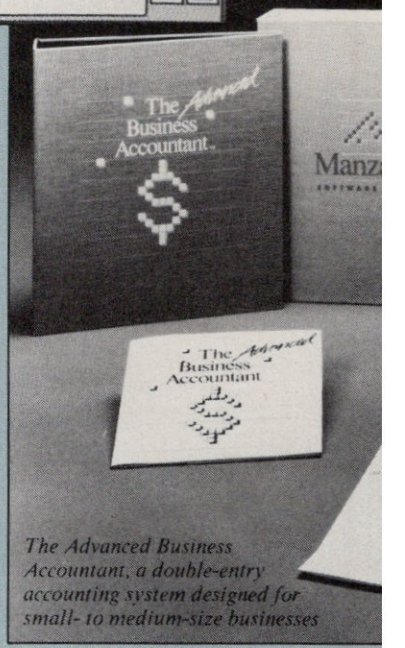
The Smart Switch Box, SSB1000, enables users to connect a modem and two peripherals to a single computer.



Ensemble, a business-software package for the Macintosh, includes a Charting feature with ten standard charts.



Ampex's 20-megabyte hard-disk subsystem also includes a 25-megabyte tape backup to provide 45 megabytes of on-line storage.



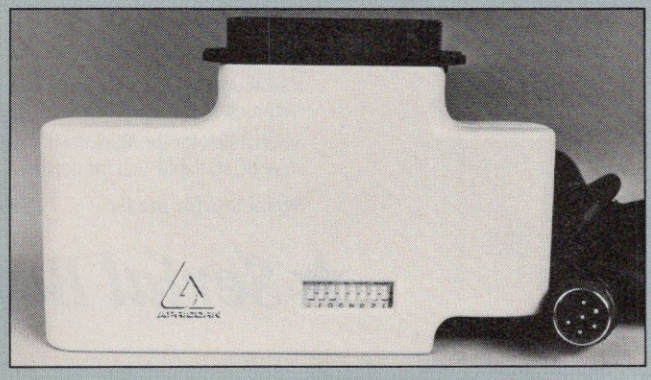
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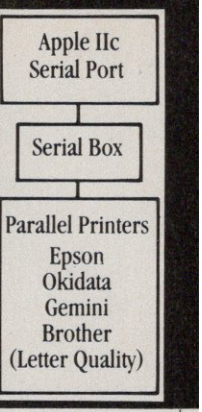
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Maccessories A-B Box lets you use three peripherals with the Mac.





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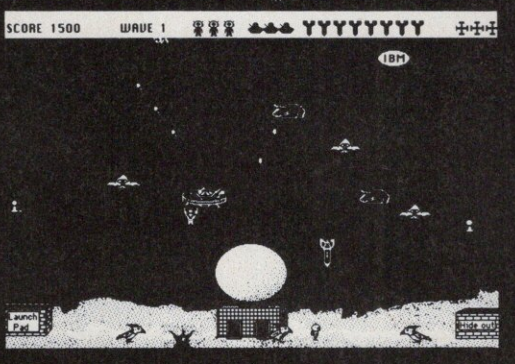
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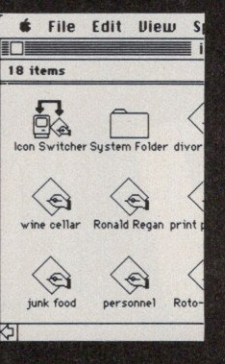
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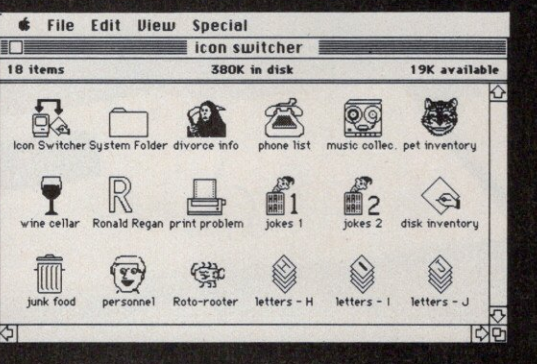
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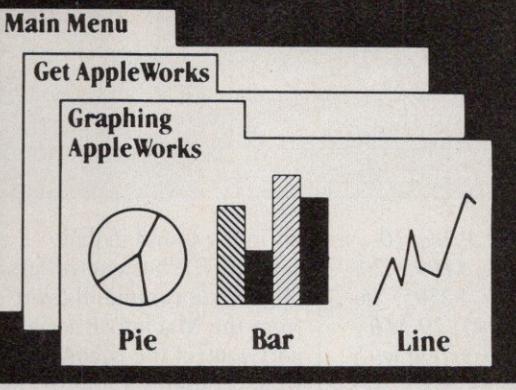
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1155B-H Chess Drive • Foster City, CA 94404

for the **Macintosh™**

archives. *(List Price: 10-MB hard disk, $1995; 20-MB hard disk, $2395; 25-MB tape, $1995; 20-MB hard-disk subsystem with 25-MB tape, $4295)*
Requires: Apple II Plus or IIe
Ampex Corporation
10435 North Tantau Avenue
Cupertino, CA 95014
(800) 421-6863
in CA (213) 640-0150
CIRCLE READER SERVICE NO. **554**

▸ HARDWARE

MAC

▸ MACCESSORIES A-B BOX

The Maccessories A-B Box lets you use three peripherals with the Macintosh by connecting two peripherals to one serial port on the computer. To do so, you plug the A-B Box into one serial port and then plug two peripherals into the box. You can then divert data output to the peripheral of your choice. The box also enables two computers to share one peripheral—you plug both computers into the A-B Box along with the single peripheral. *(List Price: $99.95)*
Requires: Macintosh
Kensington Microware Ltd.
251 Park Avenue South
New York, NY 10010
(212) 475-5200
CIRCLE READER SERVICE NO. **555**

MAC

▸ MAC488A BUS CONTROLLER

The Mac488A Bus Controller takes advantage of the high-speed serial abilities of the Macintosh to communicate at speeds of up to 57,600 bps. The interface includes all features normally found in dedicated IEEE bus controllers. High-level commands sent from the Macintosh serial port control the Mac488A, which contains a microprocessor that interprets the commands. The controller is compatible with all languages that can access the computer's serial port. Mac488A comes with power supply, manual, and a 12-foot cable. *(List price: $595)*
Requires: Macintosh
IOtech, Inc.
P.O. Box 21204
Cleveland, OH 44121
(216) 831-8646
CIRCLE READER SERVICE NO. **556**

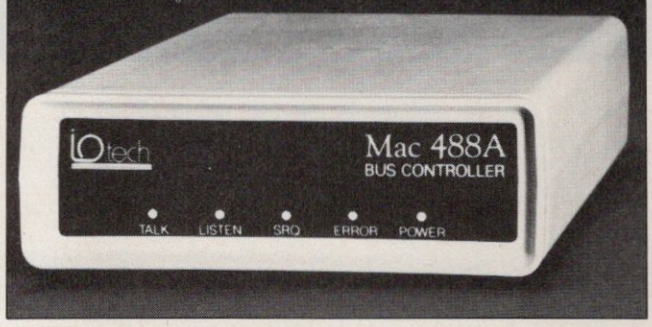
II SERIES III

▸ FORTIS DM20 DOT-MATRIX PRINTER

The Fortis DM20 dot-matrix printer, which produces high-quality graphics and letter-quality correspondence and can accommodate spreadsheets of up to 220 columns, is available from Dynax. The DM20 has rear-mounted switches that enable you to install it for either parallel or serial interfaces. It offers a choice of 10, 12, or 16.7 characters per inch or proportional print spacing in either word- or data-processing modes.

The DM20's high-resolution mode produces the equivalent of 17 × 16 dots per character, using a 0.30 mm 9-wire printhead. In pica draft mode, it operates at 160 characters per second (cps) and in letter-quality mode at 30 cps. *(List Price: $888)*
Requires: Apple II or III
Dynax, Inc.
6070 Rickenbacker Road
Commerce, CA 90040
(213) 727-1227
CIRCLE READER SERVICE NO. **557**

The Mac488A bus controller for the Macintosh, from IOtech, takes advantage of the Mac's high-speed serial abilities to communicate at speeds of up to 57,600 bpm.



II SERIES MAC

▸ QC20 MASS-STORAGE SYSTEM

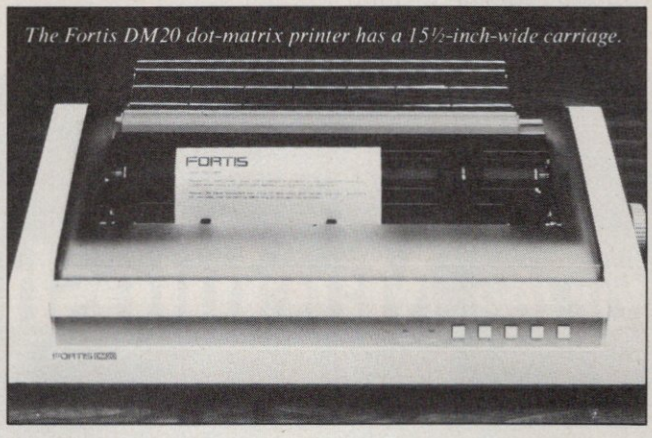
A 20-megabyte mass-storage system, the QC20 hard disk, is now available from Quark Peripherals. Users can segment the hard disk into separate volumes, each password-protected to limit or prevent access to its data. On the Macintosh, the QC20 plugs directly into the computer's floppy-disk port, leaving other ports free so that users can connect both a printer and a modem at the same time. *(List Price: $2595)*
Requires: Apple IIc, IIe, III, or Macintosh
Quark, Inc.
2525 West Evans
Suite 220
Denver, CO 80219
(303) 934-2211
CIRCLE READER SERVICE NO. **599**

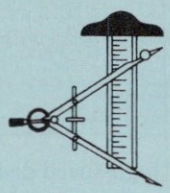
II SERIES

▸ C-PRINT PRINTER INTERFACE

The MW-100 C-Print parallel printer interface has a standard 36-pin connector that plugs into a printer and a 5-pin DIN connector that plugs into the Apple IIc's serial port. To use the interface, you need only plug it in—no special text software or configuration of the serial port is necessary. Data is output to the printer at 9600 baud with standard DTR handshaking, so no information is lost. *(List Price: $99)*
Requires: Apple IIc
Micro R&D, Inc.
3333 S. Wadsworth Blvd.
Suite A-104
Lakewood, CO 80227
(303) 985-1473
(303) 985-4077
CIRCLE READER SERVICE NO. **598**

The Fortis DM20 dot-matrix printer has a 15½-inch-wide carriage.





Introducing idd's

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The Ultimate Drawing Package for the Macintosh™

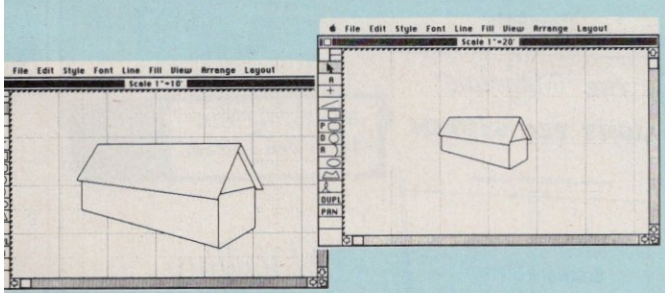
lacDraft™ is the most powerful object oriented drawing ol available for the Macintosh™ today. Its ease of use, mbined with its powerful capabilities, allows even the ost casual user to produce professional looking awings. The versatility of MacDraft™ makes it ideal r the beginner, as well as the professional.

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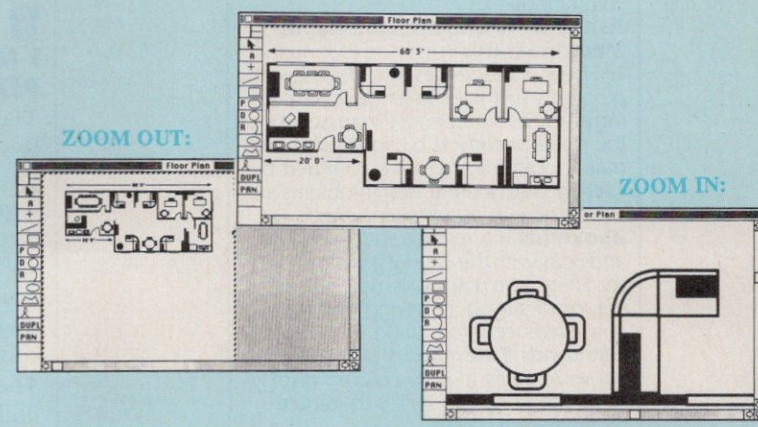
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- 16 Different scales.
- Zoom In and Zoom Out.
- Automatic dimension lines.
- Circles by radius or diameter.
- Arcs by radius or 3-points.
- Distribute objects along a line.
- Rotate objects in 1 degree increments.
- Create objects by inside or outside diameter.
- 4 Separate documents on the screen at the same time.
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- Paste pictures from MacPaint™.
- 64 Patterns for Fill & Ink.
- Flip objects.

lacDraft™ offers 16 different scales to suit your needs.



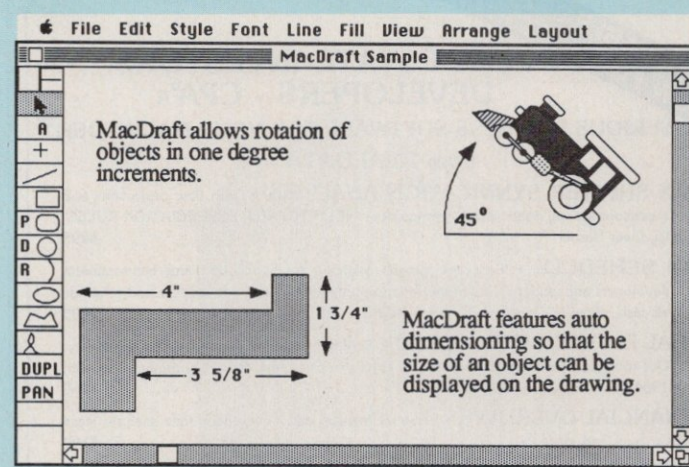
bjects created at one scale, can be pasted into a drawing at a different ale. The objects will reduce or enlarge to conform to the new scale. ou may also change the scale of the entire drawing.



The Zoom functions allow you to see either a reduced or enlarged view of the drawing. Regardless of the view, you still have full access to all of the drawing capabilities of MacDraft™.

ZOOM OUT: to see your entire drawing, and also add large objects that may stretch beyond a normal view.

ZOOM IN: to add fine details to your drawing that may not be convenient to create at a normal view.



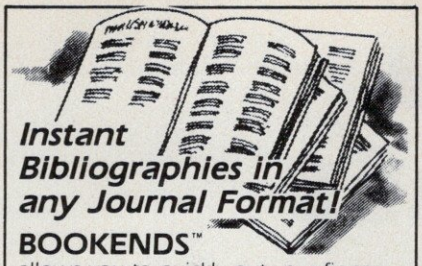
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idd inc.

Innovative Data Design, Inc.
1975 Willow Pass Road, Suite 8, Concord, California 94520 (415) 680-6818

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▶ HARDWARE/ SOFTWARE

II SERIES

▶ MAGELLAN LIGHT PEN SYSTEM II

The Magellan Light Pen System II has a high-resolution light pen with a built-in pushbutton that interacts directly with a monitor or TV screen. The pen allows you to create drawings with single-dot accuracy on the computer's graphic display. The system also includes a high-performance interface card that plugs into any expansion slot. The card includes 4K ROM containing light-pen and high-speed graphics routines.

The system comes with Quick-Draw and Amber-Pen software packages. The Quick-Draw program enables you to create and edit commercial-quality graphics designs. Its features include freehand drawing, color/pattern fill, a pattern editor, a Zoom mode, window operations, symbol tables, high-resolution text, high-speed disk commands, and more. *(List Price: $189.95)*

Requires: Apple II, II Plus, or IIe

Magellan Computer, Inc.
4371 East 82nd Street
Suite D
Indianapolis, IN 46250
(317) 842-9138

CIRCLE READER SERVICE NO. 5

II SERIES

▶ SYNTAURI COMPUTER MUSIC SYSTEM

Market Interface has ac
quired the exclusive lice
to manufacture and ma
the Syntauri Computer
Music System, which h
not been manufactured
since September 1984.
company will produce b
software and hardware
products for educators,
formers, and composer
Software currently ava
able includes Simply M
and alphaPlus, which
developed by Syntauri
poration, and Versatra
developed by Market
face.

The Syntauri Simp



*The Magellan Light Pen S
II includes a light pen, inte
card, software, and comple
documentation.*

Music System provides an easy-to-use, innovative way to learn, compose, perform, record, or teach music and is suitable for both beginner and professional musicians. It consists of a music keyboard, two foot pedals, special music cards that plug into the Apple computer, and music software and courseware. Three learning methods are available: Easy to Play, Traditional Piano, and Improvisation. Music selections include pop, rock, jazz, blues, old favorites, hymns, country, and classical.

Versatracs is a menu-driven integrated program that combines total instrument definition with multitrack recording and composition facilities. The software enables you to enter, save, process, sequence, play, and edit sound parameters in real or artificial time under computer control. Input data, such as pitch and duration, is received from a five-octave electronic keyboard to activate the computer's digital oscillators. Versatracs is compatible with the Syntauri Computer Music System and is also available complete with hardware as the Versatracs Computer Music System. *(List Price: Simply Music System, hardware and software, $1458; Simply Music software, $170; Versatracs Computer Music System, $1935; Versatracs software, price not available)*

Requires: Apple II Plus or IIe, Syntauri system, one disk drive, video monitor, amplifier, speakers

Market Interface, Inc.
126 South State
Roodhouse, IL 62082
(217) 589-4832

CIRCLE READER SERVICE NO. **560**

MAC

▸ EXPERLISP SOFTWARE AND WORKSTATION

ExperTelligence has released ExperLisp, a LISP development environment for the Macintosh. The product is available either as a complete workstation or as a stand-alone software package.

ExperLisp software is a complete implementation of the LISP programming language that provides access to the Macintosh toolbox, compiles directly to MC68000 machine code, and has extensive graphics capabilities including 3-D and spherical.

The ExperLisp Workstation includes ExperLisp software, a Macintosh XL with up to four megabytes of RAM, and a ten-megabyte hard-disk drive. *(List Price: ExperLisp, $495; ExperLisp Workstation, $6995)*

Requires: Macintosh, 512K RAM, external disk drive

ExperTelligence, Inc.
559 San Ysidro Road
Santa Barbara, CA 93108
(805) 969-7874

CIRCLE READER SERVICE NO. **561**

MAC

▸ MACCOMP PUBLISHING SYSTEM

An electronic-office composition and publishing system, MacComp combines hardware and software that enables you to compose both text and graphics into camera-ready artwork. The system includes a LaserWriter printer that can produce small numbers of professional-looking typeset copy, an enhanced hard-disk Macintosh, a Vidicon digitizing camera, approximately 80 font sets, printer-

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Allegro Software
79 Milk Street • Suite 1108
Boston, MA 02109

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MacLink
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MacLink allows you to translate spreadsheet and word-processing files between the Macintosh and the IBM PC...easily and quickly.

Now you can translate spreadsheets between Lotus on the PC and Multiplan on the Mac...including formulas, column formats, and functions.

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And you can translate documents between Wordstar or Multimate on the PC and MacWrite on the Mac...including margin settings, paragraphing, columns, and print styles.

via modems or with an optional PC to Mac cable.

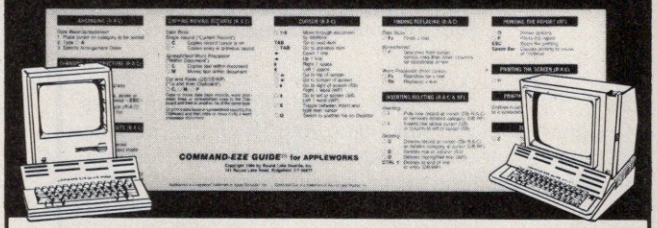
The cost is just $125: This includes the MacLink manual, and a MacLink disk for both the PC and the Mac.

DataViz, Inc.-16 Winfield Street-Norwalk, CT 06855
(203) 866-4944

Trademarks: IBM, Lotus, Macintosh, MacWrite, Multimate, Multiplan, Wordstar

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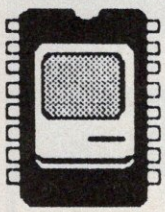
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MacMemory Electronics
500 W. Middlefield Rd., Suite 28
Mountain View, CA 94043 (415) 964-4176

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CIRCLE 132 ON READER SERVICE CARD

A+ pipeline

driver software, and other software such as a built-in word processor. Other features include a transparent electronic ruler; a scissor pointer that lets you clip columns of text into fragments or carryovers; separate Format, Layout, and Print menus; and dummy pages with miniatures of page-makeup layouts. *(List Price: $6495)*
Infotek, Inc.
56 Camille
E. Patchogue, NY 11772
(516) 289-9682)
CIRCLE READER SERVICE NO. **562**

▸SOFTWARE

II SERIES

▸WHERE IS CARMEN SANDIEGO?

The second release in Brøderbund's Explorations series of educational games, Where in the World is Carmen Sandiego? enables players to sharpen their mystery-solving skills while they learn about world geography. The game comes with a copy of the *1985 World Almanac and Book of Facts* to help players find clues as to the whereabouts of international thieves such as Sandiego. Every game is different—the mystery scenarios involve 10 different villains and 30 countries. *(List Price: $39.95)*



A sample screen from Where in the World is Carmen Sandiego?, an educational game from Brøderbund Software

Requires: Apple II Plus, IIe, or IIc; 64K RAM; one disk drive
Brøderbund Software
17 Paul Drive
San Rafael, CA
94903-2101
(415) 479-1170
CIRCLE READER SERVICE NO. **563**

MAC

▸DATAPAK MAC SOFTWARE

DataPak Software has released two new software products—Mac-Poker, a gambling game, and the Printer Interface—for the Macintosh.

Mac-Poker is a five-card-draw game that you can play against the Macintosh, using the mouse. Play starts with the ante being placed in the pot and the "dealer" dealing five cards. You bet or pass, the dealer sees your bet or passes, and you then discard unwanted cards and draw up to five new ones. You bet or pass again, and the dealer matches, passes, or folds. As well as clear graphics, the game has humorous editorial comments from the dealer regarding your skills.

Printer Interface allows you to interface the Macintosh with virtually any serial-interface letter-quality printer and several dot-matrix printers. The software works with all programs available for the Mac and can add features, such as boldface or underlining, if your program or printer does not have them. *(List Price: Mac-Poker, $39.95; Printer Interface, $59.95)*
Requires: Macintosh
DataPak Software, Inc.
14011 Ventura Blvd.
Suite 401
Sherman Oaks, CA 91403
(818) 905-6419
CIRCLE READER SERVICE NO. **564**

▸ ASCII EXPRESS PRO-DOS

A new updated telecommunications package designed to work with Apple IIe or IIc computers running under ProDOS is now available. ASCII Express Pro-DOS is compatible with all popular modems and direct-connect applications and allows users to dial up any public-information databases or to communicate with other computers. The program includes on-line help menus, support for baud rates up to 9600, error-free file-transfer protocols, macros, unattended operation, a data buffer, and an easy-to-use Install program that lets you customize the package.

(List Price: $129.95)
Requires: Apple IIe or IIc
United Software Industries, Inc.
1880 Century Park East
Suite 311
Los Angeles, CA 90067
(213) 556-2211
CIRCLE READER SERVICE NO. **565**

▸ KRELL SOFTWARE PROGRAMS

Two new programs are now available from Krell Software. Reading Assessment Program: Individual Diagnostic enables you to evaluate and analyze children's reading skills. The program not only identifies the student's specific reading problem areas but also provides reading practice, helps build vocabulary, and prepares students for state-mandated tests. Other features include a choice of difficulty levels and the ability to generate hard copy and disk records.

Study Money incorporates a large database of financial-aid sources that students can use to assist them in their search for aid. Students provide information about their career goals, personal background, academic training, and so on, and the program uses this information to identify those awards for which the student is qualified. The program then offers guidance in writing to the appropriate award sources. *(List Price: Reading Assessment Program, $199.95; Study Money, $49.95)*
Requires: Apple II, II Plus, or IIe
Krell Software Corporation
1320 Stony Brook Road
Stony Brook, NY 11790
(516) 751-5139
CIRCLE READER SERVICE NO. **521**

▸ GRAPHWORKS ProDOS PROGRAM

Offering business-graphics capabilities to users of AppleWorks, GraphWorks is a stand-alone ProDOS program that directly utilizes AppleWorks' spreadsheet data files and plots them as four graph types—bar, stacked bar, line, and pie. The program is menu-driven and folder-oriented.

RENT SOFTWARE

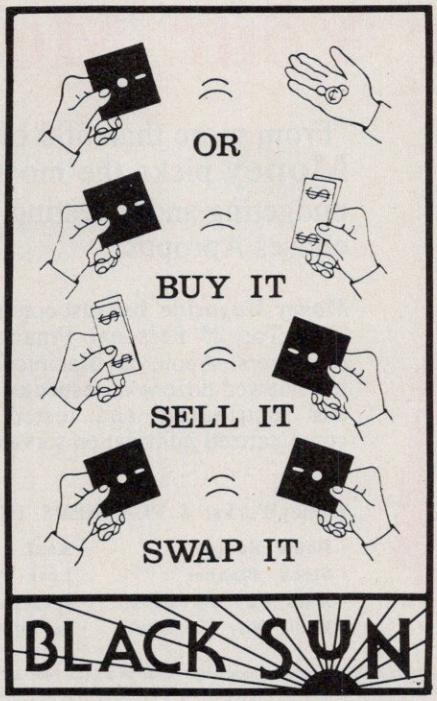
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For more information

Call (215) 967-3300

or write
Black Sun
411-A State Road
Emmaus, PA 18049

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Macintosh is a registered trademark of Apple Computer, Inc.

CIRCLE 160 ON READER SERVICE CARD

Other features include a title editor, a pop-up Option window, and a choice of two sizes of printouts. *(List Price: $79.95)*

Requires: Apple IIe or IIc, one disk drive, AppleWorks, optional printer

PBI Software
1155B-H Chess Drive
Foster City, CA 94404
(800) 843-5722
in CA (800) 572-2746

CIRCLE READER SERVICE NO. **547**

MAC

▸ FONT SETS FOR THE MAC

Two new font collections for the Mac are available from 21st Century Software.

The UltraFonts Technical & Business Set features a font that includes more than 100 commonly used medical, legal, mathematical, and engineering symbols that come in every standard Macintosh size, from 9 to 36 point. The set also contains two Greek fonts—serif and sans serif—and a mathematics font that enables users to create complex formulas in MacWrite.

The second product, UltraFonts Extended Character Set, includes 21 fonts, ranging from 6 to 36 points in size, that are equipped with all the special accents users need to type in languages such as Czech, Polish, Hungarian, Esperanto, and many more. The collection also includes a 6-point font for small lettering, a correspondence-quality font for letters and reports, a borders font that allows users to type in boxes and borders, and a symbols font that includes many of the standard icons that the Macintosh uses. *(List Price: $29.95 each; $49.95 together)*

Requires: Macintosh

21st Century Software
Malon Products, Inc.
2306 Cotner Avenue
Los Angeles, CA 90064
(213) 829-4436

CIRCLE READER SERVICE NO. **566**

MAC

▸ MACLINE NETWORKING

The third product in TouchStone Software's The Connectables series, MacLine is a networking software package for the Macintosh. Using the MacLine terminal emulator, users can connect their Macintosh computers to a variety of other computers and information services. When you use MacLine in conjunction with the other Connectables products—PCworks and UniHost—the Macintosh can transfer all types of files to and from UNIX systems or IBM PCs, exchange mail with other system users, and access a remote printer or disk. *(List Price: $145)*

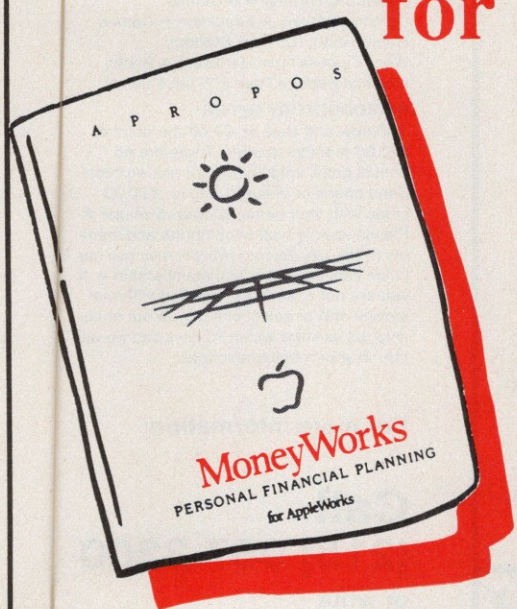
Requires: Macintosh

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MAC

▸ MASTERFORTH

An implementation of the Forth programming language for the Macintosh, MasterForth includes a 68000 macro-assembler and support for the mouse, the Finder, menus, and the graphics toolbox. Standard features include a string package and resident debugger, and relocatable utilities and transient definitions enable users to run substantial software packages. MasterForth exactly matches the Forth-83 standard dialect described in *Mastering Forth* (Brady, 1984), which is also included in the package. *(List Price: $125)*

Requires: Macintosh

MicroMotion
12077 Wilshire Blvd. Suite 506
Los Angeles, CA 90025
(213) 821-4340

CIRCLE READER SERVICE NO. **568**

MAC

▸ HEARTS CARD GAME

A card game designed for the Macintosh, Hearts offers realistic card and playing-table graphics; automatic shuffling, dealing, and point tabulation; variations of your opponent's skill level, passing, and first-trick discards; and more. The program makes use of the computer's mouse, and pull-down menus provide a tutorial and rules for play. *(List Price: $29.95)*

Requires: Macintosh

Artsci, Inc.
5547 Satsuma Avenue
North Hollywood, CA 91601
(818) 985-5763

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II SERIES

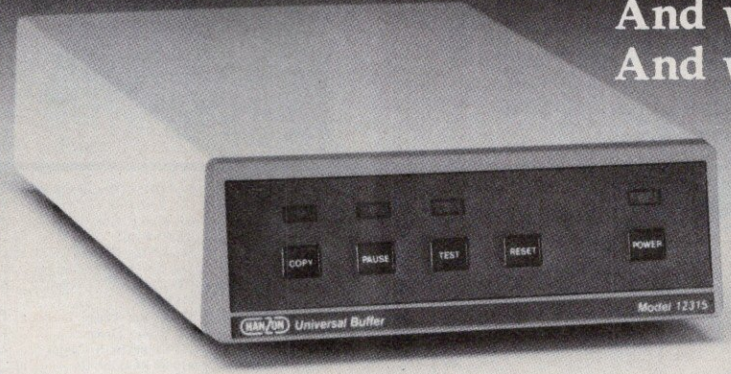
▸ NEW PIXELWERKS SOFTWARE

A new program is available in Mindscape's Pixelwerks line of educational software, which is designed to teach children eight years and older to use computers as creative tools and to develop programming skills. The program forms part of a series of six programs that can be used in conjunction with one another.

The new program, Mr. Pixel's Cartoon Kit, lets children select or build colorful cartoon characters and then

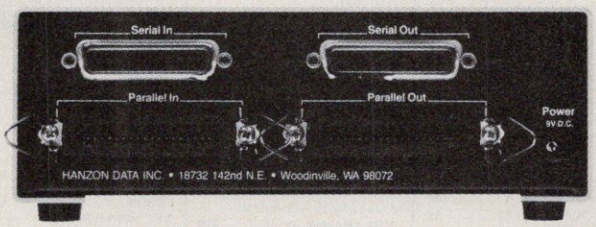
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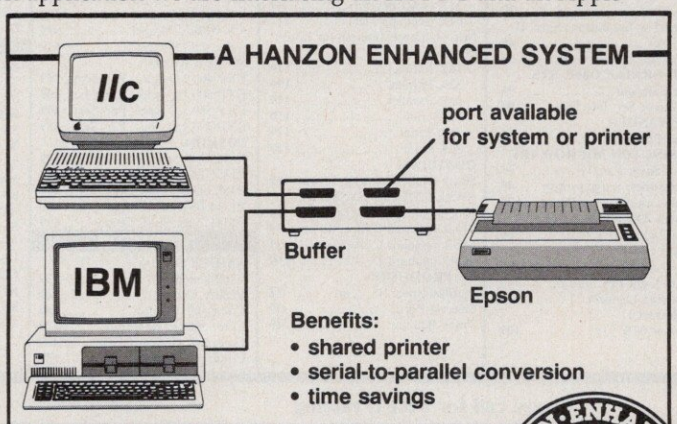


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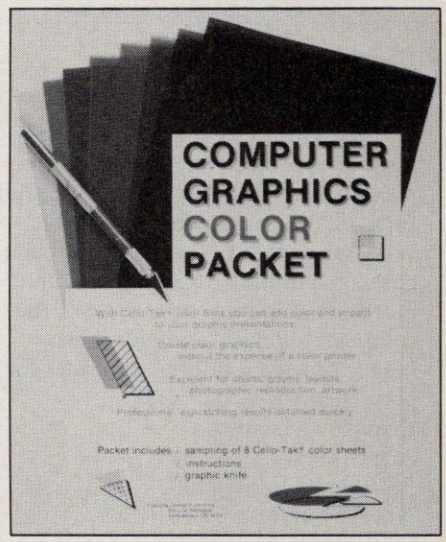
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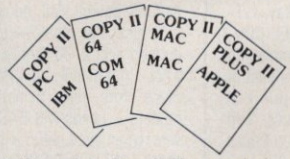
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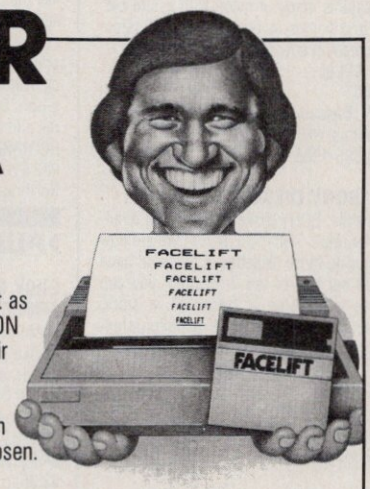
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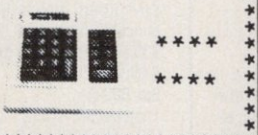
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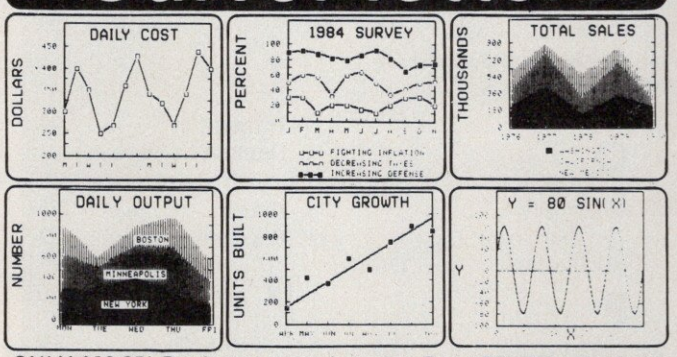
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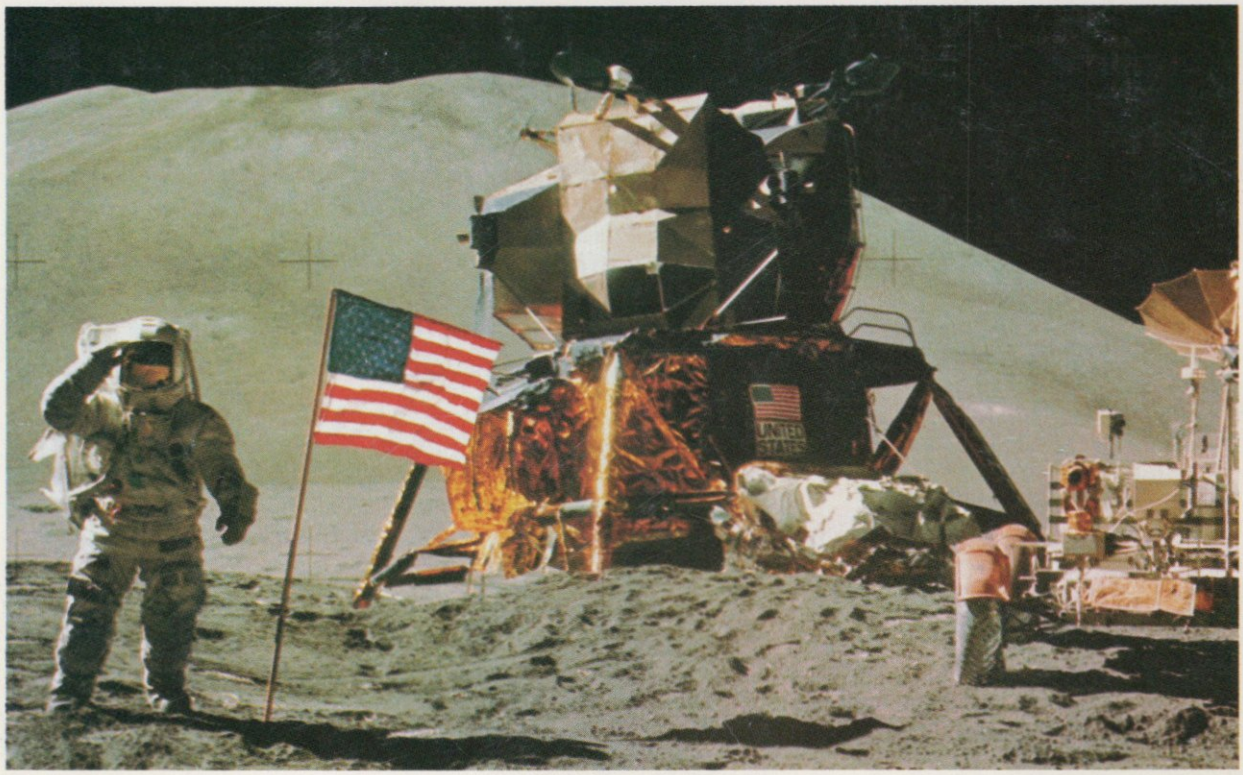
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