THE APPLE II MAGAZINE

inCider

Editors' Choice
The Apple Personal Modem

A CWC/I Publication
USA $2.95/Canada $3.95
December 1985

Special Holiday Gift Guide

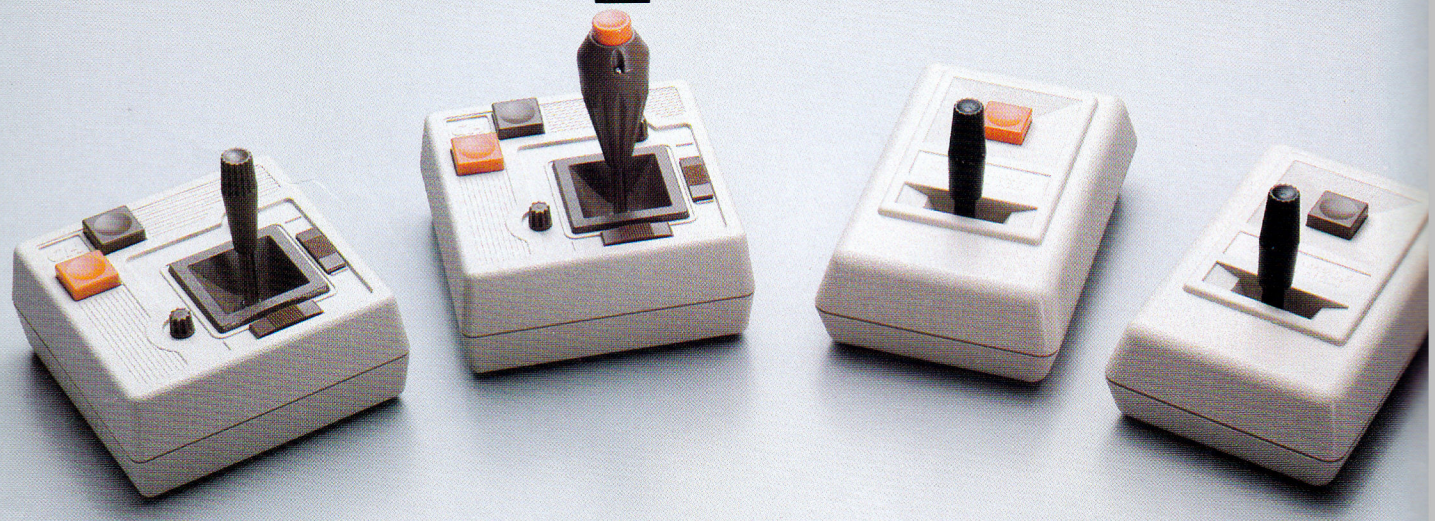
Make Wishes Come True

RAM Boards Close The Memory Gap Between Apples and IBMs

Reviews of
Visible Pascal
Kyan Pascal
Peterson's College Guides
The Railroad Works
and more

0 74470 12066 12

Superior firepower



►MACH II™ and MACH III™ JOYSTICKS

The second generation MACH II and MACH III Joysticks incorporate a new slide-switch spring disconnect feature that requires no stick deflection and new rotary trims which are four times more precise.

Additional features include: "spring centering" or "positive true-positioning" modes of operation, electrical trims for each axis, two fire buttons on the deck of the control and a stainless steel ball as the main pivot for added precision and durability. Our MACH III Joystick has an added fire button on the stick handle.

These highly accurate and reliable 360-degree microcomputer cursor controls used for games, business and graphics applications provide more features, greater durability, and longer life cycles. Plug-in compatible with Apple II, IIE, IIC, IBM PC, PCjr and TRS-80 Color Computers.
MACH II **$44.95** / MACH III **$54.95**

►PADDLESTICKS™

PADDLESTICKS are a new and unique paddle control design that promises to return the fun and excitement back to paddletype games. They are faster, easier to operate and less fatiguing than conventional-type paddles. The PADDLESTICKS operate as a single-axis joystick and are currently plug-in compatible with the Apple II, IIE and IIC personal computers.
$44.95 (pair)

We manufacture a complete line of OEM Joysticks for industrial applications. Dealer and OEM inquiries invited. Apple II, IIE, IIC, IBM PC, PCjr and TRS-80 are registered trademarks of Apple Computer Inc., International Business Machines and Tandy Corp., respectively.

CH products™

Formerly Hayes Products
1558 Osage Street
San Marcos, California 92069
(619) 744-8546

More bang for the buck.

Manufactured in U.S.A.

Original Page Torn

...ET PHI BETA KAPPA

...er's Academic American ...yclopedia's Electronic Edition ...vers a complete set of encyclope-

...right to your living ...m just in time for ...ay's homework. It's ...tinuously updated... ...doesn't take an inch ...xtra shelf space.

...e **College Board,** operated by the ...llege Entrance Examination ...ard, gives tips on preparing for the ...T, choosing a college and getting ...ancial aid.

KEEP HEALTHY

...althnet will never replace a real, ...doctor—but it is an excellent and ...dily available source of health and ...dical information for the public.

...man Sexuality gives the civiliza- ...that put a man on the moon an ...lligent alternative to the daily ...vice to the Lovelorn" columns. ...ndreds turn to it for real answers.

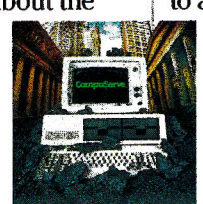
BE INFORMED

the latest news is at your ...ertips. Sources include the AP ...s wire (covering all 50 states plus

national news), the Washington Post, USA TODAY Update, specialized business and trade publications and more. You ...find out instantly what Congress ...yesterday; who finally won the ...ne; and what's happening back in ...kaloosa with the touch of a button. ...d our electronic clipping service ...s you tell us what to watch for. We'll ...ctronically find, clip and file news ...you...to read whenever you'd like.

INVEST WISELY

...mprehensive investment help ...st might tell you more about the ...ock you're looking at ...an the company's ...hairman of the Board ...nows. (Don't know who ...e is? Chances are, we ...an fill you in on that, ...o.) CompuServe gives you com- ...lete statistics on over 10,000 NYSE, ...MEX and OTC securities. Historic ...ding statistics on over 50,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And more than a dozen other investment tools.



Site II facilitates business decisions by providing you with demographic and sales potential information by state, county and zip code for the entire country.

National and Canadian business wires provide continuously updated news and press releases on hundreds of companies worldwide.

GET SPECIALIZED INFORMATION

Pilots get personalized flight plans, weather briefings, weather and radar maps, newsletters, etc.

Entrepreneurs use CompuServe too for complete step-by-step guidelines on how to incorporate the IBMs of tomorrow.

Lawyers, doctors, engineers, military veterans and businessmen of all types use similar specialized CompuServe resources pertinent to their unique needs.

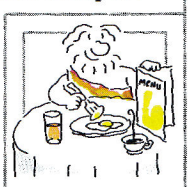
And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. With CompuServe, you get low start-up costs, low usage charges and local phone-call access in most major metropolitan areas.

Here's exactly how to use CompuServe.

First, relax.

There are no advanced computer skills required.



In fact, if you know how to buy breakfast, you already have the know-how you'll need to access any subject in our system. That's because it's "menu-driven," so beginners can simply read the menus (lists of options) that appear on their screens and then type in their selections.

Experts can skip the menus and just type in "GO" followed by the abbreviation for whatever topic they're after.

In case you ever get lost or confused, just type in "H" for help, and we'll immediately cut in with instructions that should save the day.

Besides, you can either ask questions online through our Feedback service or phone our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit, a computer, a modem to connect your computer to your phone, and in some cases, easy-to-use communications software. (Check the information that comes with your modem.)

With your Subscription Kit, you'll receive:

- a $25 usage credit.
- a complete hardcover Users Guide.
- your own exclusive user ID number and preliminary password.
- a subscription to CompuServe's monthly magazine, *Online Today.*

Call **800-848-8199** (in Ohio, 614-457-0802) to order your Subscription Kit or to receive more information. Or mail this coupon.

Kits are also available in computer stores, electronic equipment outlets and household catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.

☐ Please send me additional information.
☐ Please send me a CompuServe Subscription Kit.
☐ I am enclosing my check for $39.95, plus $2.50 handling. *(Add sales tax if delivered in Ohio.)*

Please make check payable to CompuServe Information Services, Inc.

☐ Charge this to my VISA/MasterCard

#_____

Expiration Date _____

Signature _____

Name _____

Address _____

City _____

State _____ Zip _____

MAIL TO:

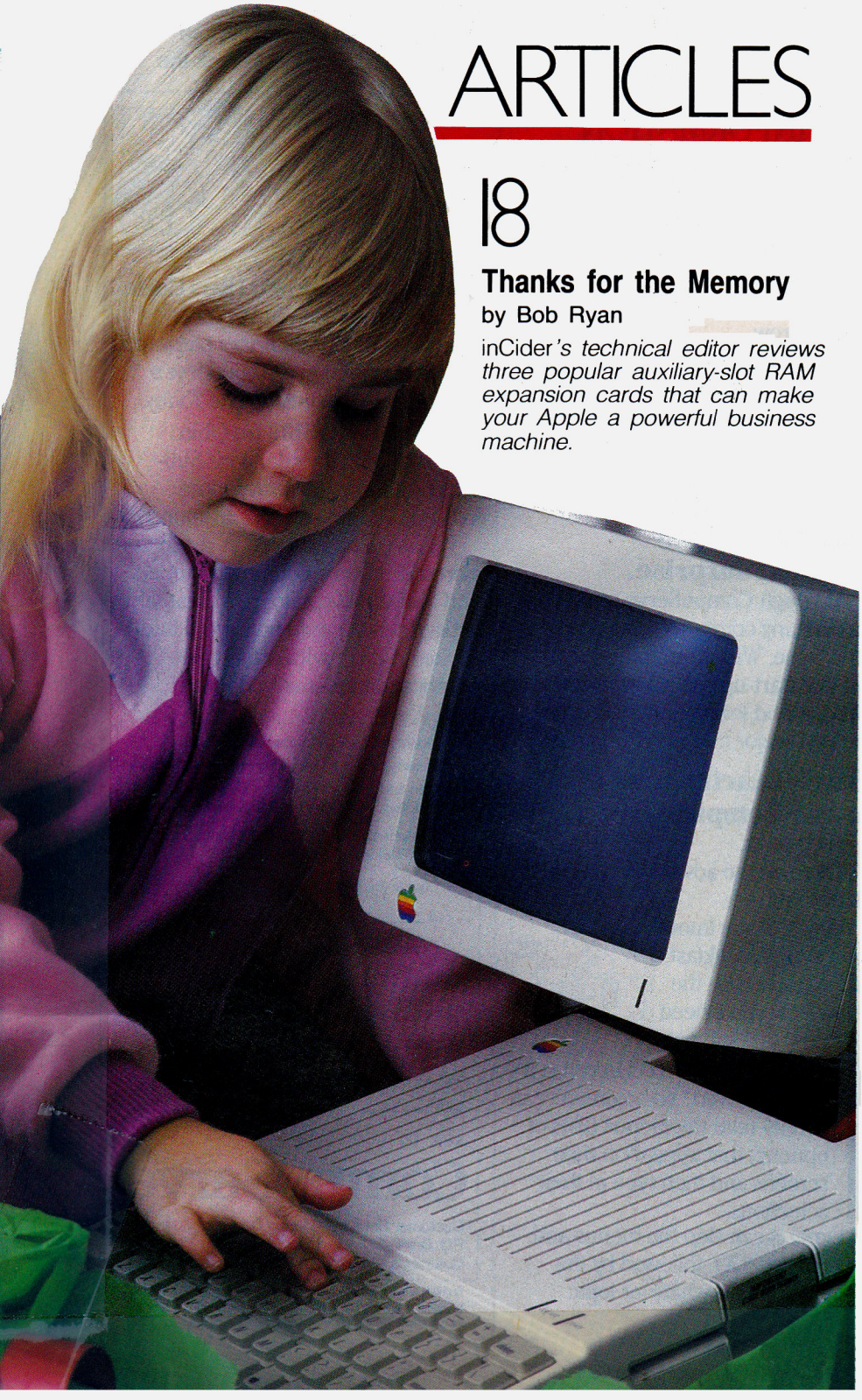
CompuServe®

Customer Service Ordering Dept.
P.O. Box L-477
Columbus, Ohio 43260 PRI2812

An H&R Block Company

EasyPlex and ELECTRONIC MALL are trademarks of CompuServe, Incorporated. Travelshopper is a service mark of TWA.

inCider



ARTICLES

18

Thanks for the Memory
by Bob Ryan
inCider*'s technical editor reviews three popular auxiliary-slot RAM expansion cards that can make your Apple a powerful business machine.*

28

Gray Flannel Sorts
by Peter C. Lincoln
There's more than one way to sort a data base—this graphics program demonstrates five techniques on screen.

38

The Gemini 10X: A Reformed Character
by Phillip M. Jockell
Your Gemini 10X can print a slashed zero—our program lets you define its shape, then download to your printer's RAM.

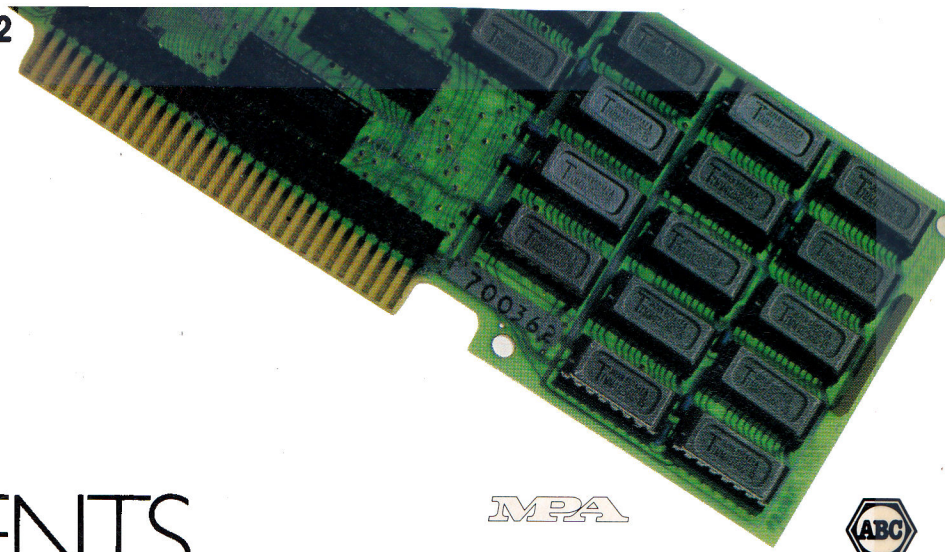
46

Holiday Gift Guide
inCider *presents a host of holiday gift ideas for your favorite Apple II user.*

149

***inCider*'s 2-Bit Programming Contest: Winners Announced!**
What can you do in two lines of Applesoft code? Plenty—just take a look at the top three entries in our 2-bit challenge.

December 1985 Vol. 3 No. 12



DEPARTMENTS

Editorial 6

Letters 8

News Line 14
Tee Off; Computer Law; A New Order

BackTalk 56
This month's survey: Christmas wishes

Applesoft Adviser 65
Trivial Trivia: Part 2
by Dan Bishop

Ask *inCider* 81
Strings & Things; Controls in File Names; Garbage Collection

Pascal Primer 88
Facts on Filer: Part 2
by Tom Swan

Apple Clinic 101
Trains Again; 80-Column Cards; //c Ports
by Jim Sather

Right of Assembly 106
An Assemblage of Assemblers
by Roger Wagner

Reviews 118
UniDisk; Visible Pascal; Kyan Pascal; V-Color Graphics Tool Kit 1.0; Remember!; Peterson's Financial Aid Service and *Peterson's College Selection Service; Standard & Poor's Stockpak II; Willy Byte in the Digital Dimension; Think Fast*

Extract 134

New Products 136

DataGram 140
by Matthew Lesko

Game Room 145
The Railroad Works; Baltic 1985; Micro League Baseball; World's Greatest Baseball Game; Wishbringer
by Brian J. Murphy

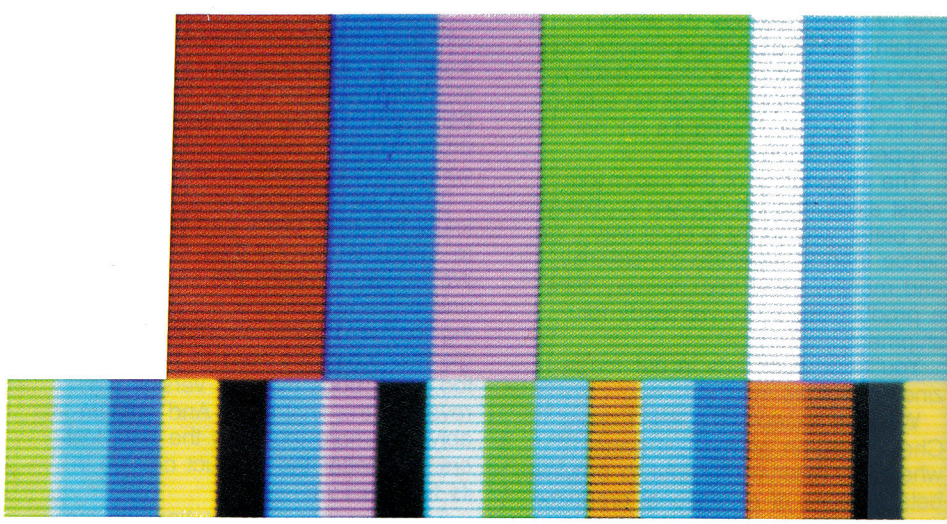
Hints/Techniques 150
Portal Update; Multipage Dump; Picture Combine

Coming Attractions 156

Reader Services 156

Editors' Choice 160
Apple Personal Modem

Photo credits: cover, Ed Judice; p. 18, Frank Cordelle; p. 46, Ed Judice; p. 160, Frank Cordelle.



inCider (ISSN #0740-0101) is published monthly by CW Communications/Peterborough, Inc., 80 Pine Street, Peterborough, NH 03458. Phone: (603) 924-9471. Second-class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second class mail registration number 9590.) Subscription rates in U.S. are $24.97 for one year, $38.00 for two years and $53.00 for three years. In Canada and Mexico, $27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), $44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. All U.S. and Canadian subscription correspondence should be addressed to *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Please include your address label with any correspondence. For questions concerning your subscription and to place subscription orders, please call us toll free at 1-800-645-9559 between 9 a.m. and 5 p.m. or write to *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Postmaster: Send address changes to *inCider*, Subscription Services, P.O. Box 911, Farmingdale, NY 11737. (Send Canadian changes of address to: *inCider*, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.) Entire contents copyright 1985 by CW Communications/Peterborough, Inc.

EDITORIAL

Great Expectations

by Susan Gubernat

Recently, the following item from *The Boston Globe* created a bit of a ripple in our offices:

"Paradox, a software program made by Ansa Software, was shipped to dealers three days before it was officially announced, venture capitalist Benjamin Rosen said last week. In an industry known for 'vaporware,' or software that never materializes, Rosen was justly proud."

Paradox, indeed, we thought.

We've all grown jaded enough to bide our time when we first hear the distant, then ever-widening, circles of new-product rumors, followed by a deluge of press releases. We've learned a certain kind of grudging patience after going to a trade show like COMDEX, let's say, and laying hands on a product in May, then finding it's still not shipped in October.

The importunity of the eager journalist aside, though, there's probably no better way to try a consumer's patience than to advertise consistently, and months away from delivery date, a product that's not yet ready for shipment.

You'll find such ads in our magazine as well as in others.

With the exception of our Editors' Choice column on the last page, where we reserve the right to preview beta versions of exceptional products that come to our attention, our policy is to review products only in their final versions. All things being equal, our reviewers are appraising the same version of software, the same configuration of hardware that you'd buy from your retailer or through the mail.

So we're well aware that a full-page advertisement, even accompanied by a coupon to be clipped and mailed along with paper or plastic payment, doesn't necessarily mean availability. We know this because "final versions" of products sometimes reach our offices months after they've appeared among our ad pages.

Let's not be naive, either, about the power of suggestion—blatant or subliminal. Marketing people aren't dummies. Their job is to create expectation, even need. And that they do eminently well.

But there's a cut-off time, too—and I wonder if anyone has determined what it is—between excitement about and anticipation of a product, and other stages: consumer anxiety, frustration, even anger and resentment toward the company that's advertising but not shipping.

The press has been accused, along with the marketeers, of touting "vaporware": products that are still gleaming in some developer's eye. Through our policy of reviewing only deliverable products, we're keeping your—the consumer's—interests in mind.

To be fair to advertisers, we also know that their plans can be subject to situations beyond their control. We've seen (literally) the inventory of one of these products a-building, waiting for the delayed shipment of a single microchip. It's hard to predict, too, what bugs that last version will reveal in the final tests. And presumably, the more thorough the beta testers, the better the product can be in its final version.

Some companies have handled the time gap between announcement and delivery date by indicating a date of availability in the ads themselves. "Coming soon" or "at your local theater this summer" works for trailers in the movies. Why not an analogous banner for microcomputer advertising? I find I'm attracted to the ads that announce a date of readiness. To me they portray both a concrete promise of delivery and at the same time stimulate an expectation that can reasonably be met.

What's the promise a famous vintner used to make in its advertising? "We will sell no wine before its time"—rather effective marketing, that.

Beyond the Operating System

Steve Jobs' split with Apple, and the subsequent litigation over proprietary product information—along with some key employees—that Jobs may have taken with him have occasioned more postmortems than an obituary page in a retirement-community newsletter could handle.

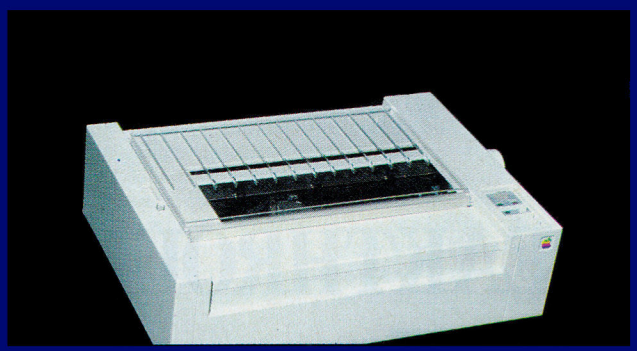
Let's not mourn Jobs; he can (and does) take care of himself. Recognize instead how much life there is after Apple for Apple alumni like Bill Cleary of International Solutions (The Mouse Series) and Jeff Raskin of Information Appliance. (Next month we'll be looking at his amazing SwyftCard, a //e plug-in board for writing, filing, communicating, and calculating that creates its own universe separate from DOS.)

The irony in Raskin's case, as he made clear to us, was that his intention to make the Macintosh (he was on the original development team) much easier to use than it is today was thwarted by Jobs. His—and others'—responses, though, have created a host of products that are extending the life of the Apple II—as aficionados of that computer, who continue to keep the user in mind, are bound to do.

As a newly defined, market-driven operation, Apple Computer now must stay close to the consumer. The positive indicators of this consumer consciousness range from increased dialogue with user groups to new-product releases for the II line (see last month's *inCider*), holiday price cuts, and, ultimately, the promise of upward compatibility for the new iteration of the II we all hope to see next year. ■

THE RIGHT CONNECTIONS

CLOCK ONLY VERSION NOW AVAILABLE AT REDUCED PRICES

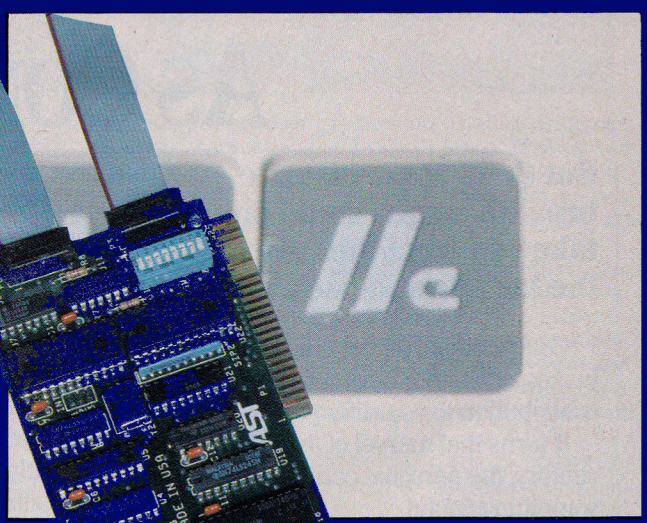


Printer serial port

Modem serial port

Clock/Calendar

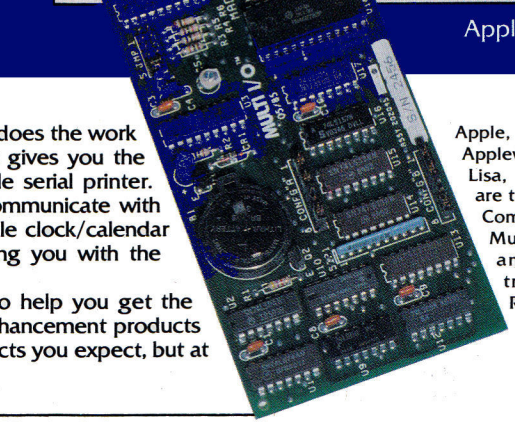
Software Utilities



Apple IIe compatible

AST's Multi I/O™ is a multifunction card for the Apple IIe™ that does the work of three individual boards. First, the Multi I/O printer serial port gives you the right connection to hook up your ImageWriter™ or a compatible serial printer. Second, Multi I/O provides you with the right connection to communicate with the outside world via the modem/terminal port. And the versatile clock/calendar is the right connection for AppleWorks™ and ProDOS™ providing you with the accurate date and time even when your computer is turned off.

At AST we are consistently providing the right connections to help you get the most out of your personal computer. We set the standard for enhancement products for personal computers by bringing you the type of quality products you expect, but at a very cost effective price.



Apple, Apple IIe, ProDOS, Appleworks, ImageWriter, Lisa, and Macintosh XL are trademarks of Apple Computer, Inc.
Multi I/O, RamStak, and MicroStor are trademarks of AST Research, Inc.

MicroStor™ is the 10 MB hard disk and tape backup (opt.) system that provides the right connection between the Apple IIe and dependable 3.5" Winchester Disk/Cartridge tape mass storage.

RamStak™ is the right connection for expanding the memory capability of your Macintosh XL™ (Lisa™). The card provides additional memory in configurations ranging from 512K to 2.0 MB.

We help Apples™ grow!™

AST RESEARCH INC.

2121 Alton Avenue, Irvine, CA 92714
(714) 863-1333 Telex 753699 ASTR UR

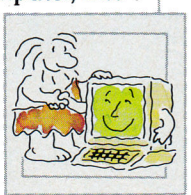
Circle 216 on Reader Service Card.

SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPUSERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to your life.

It turns that marvel of the 20th century, the personal computer, into something useful.



Unlike most personal computer products you read about, CompuServe is an information service. It isn't software. It isn't hardware. And you don't even have to know a thing about programming to use it. You subscribe to CompuServe —and 24 hours a day, 7 days a week, it puts a universe of information, entertainment and communications right at your fingertips.

A few of the hundreds of things you can do with CompuServe.

COMMUNICATE

EasyPlex™ Electronic Mail lets even beginners compose, edit, send and file messages the first time they get online. It puts friends, relatives and business associates—anywhere in the country —in constant, convenient touch.

CB Simulator features 72 channels for "talking" with thousands of other enthusiastic subscribers throughout the country and Canada. The chatter is frequently hilarious, the "handles" unforgettable, and the friendships hard and fast.

More than 100 Forums welcome your participation in "discussions" on all sorts of topics. There are Forums for computer owners, gourmet cooks, veterinarians, pilots, golfers, musicians, you name it! Also, Electronic Conferencing lets businesses put heads together without anyone having to leave the shop.

Bulletin Boards let you "post" messages where thousands will see them. You can use our National Bulletin Board or the specialized Bulletin Boards found in just about every Forum.

HAVE FUN

Our full range of games includes "You Guessed It!", the first online TV-style game show you play for real prizes; and MegaWars III, offering the ultimate in interactive excitement. And there are board, parlor, sports and educational games to play alone or against other subscribers throughout the country.

Movie Reviews keep that big night at the movies from being a five star mistake.

SHOP

THE ELECTRONIC MALL™ gives you convenient, 24-hour-a-day, 7-day-a-week shopping for name brand goods and services at discount prices from nationally known stores and businesses.

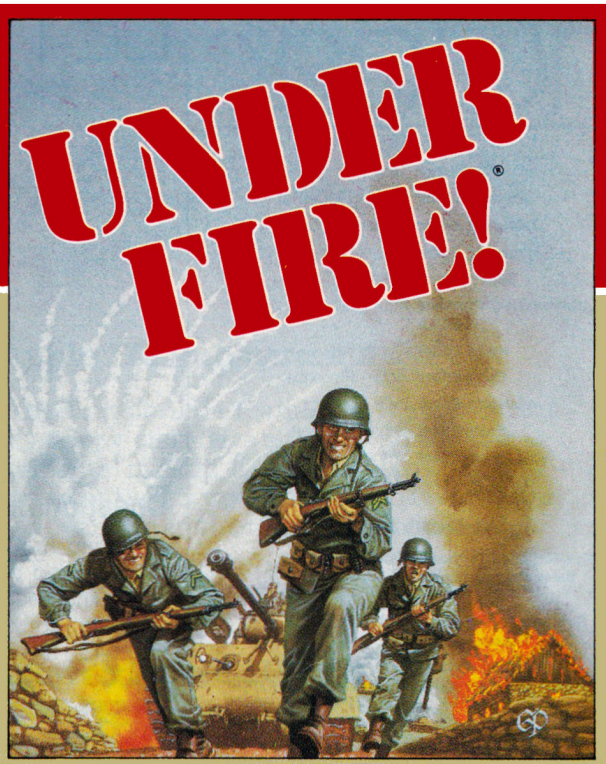
SAVE ON TRIPS

Travelshopper℠ lets you scan flight availabilities (on virtually any airline — worldwide), find airfare bargains and order tickets right on your computer.

Worldwide Exchange sets you up with the perfect yacht, condo, villa, or whatever it takes to make your next vacation *a vacation*.

A to Z Travel/News Service provides the latest travel news plus complete information on over 20,000 hotels worldwide.

UNDER FIRE!



It was quiet under the blistering Russian sun except for the rumble of gunfire off through the hills. Through his binoculars, the Soviet lieutenant could see the road leading into the dacha. The hedge blocked his view of most of the ground, and nothing could be seen moving among the second story windows. His orders were to take his squads and three T34/76 tanks in and occupy the abandoned country house.

From the wheatfields of Russia to the hedgerows of northern France, this is the world of **Under Fire**, the game of tactical World War II combat. Commanding an array of armor, infantry and support guns, take your men into the razor's edge of combat.

The lieutenant stood up and waved his arm in a circle. Around him arose fifty men who deployed in a line. Silently, they passed through the cool woods toward the hedge, their eyes scanning the windows, their fingers calmly resting on the trigger guards of their rifles.

Men and weapons from the United States, Germany and the Soviet Union are represented. The map is a topographic re-creation of the ground they fought over, shown in three different scales. Choose the situational map for the strategic flow of battle, or the tactical screen that shows the terrain in amazing detail.

They were 30 meters from the hedge when the land exploded in smoke and flame. A machine-gun nest spoke from a window, sending the patrol to the earth. The hissing rocket from a panzerfaust caused one of the tanks to explode, its crew bailing out of all hatches. Two Panther tanks moved out from under their cover. The lieutenant ran forward in a crouch, waving to the squads that were not pinned under fire to follow.

Strategic and Tactical Maps.

Front line combat is never predictable. Hidden units can appear out of nowhere, attack and vanish again. If caught in the open, a green squad can break and suffer horrendous casualties, while veterans rush for cover. In **Under Fire**, squads are rated for morale and training. The computer handles all line-of-sight problems, and can direct the fire of your units. Without the complexities of figuring odds and terrain charts, finding the proper strategy depends upon instinct and experience. All of the uncertainties of combat are present.

The lieutenant and his patrol moved swiftly and methodically through the woods. One of the T34's entered the yard and was trading shots with the Panther. A German squad was suddenly flushed from their hidden position and was cut down by the tank's machine gun.

Under Fire, lets you begin play immediately! All orders are entered using simple keyboard or joystick commands, and there is a helpful tutorial in the rulebook to take you step-by-step into your first battle. The nine scenarios range from open-field firefights to house-to-house conflict. Each scenario can be different when you change the ten variables, including nationality, skill level and victory conditions.

A Wargame Construction Set!

Design your own maps and scenarios. It's easy with **Under Fire**. The Mapmaker disk can re-create the **bocage** of Normandy, the Russian steppes and the final assault on Berlin! Design the order of battle to emphasize infantry, armor or a mixture of the two. Choose among other factors, the weather, map scale, general orders and victory conditions. Order a squad to attack or defend terrain, destroy the enemy, delay the advance or break out of the pocket. Finally, save your own scenarios to disk and they'll be ready to play anytime (the computer is always willing to play). **Here's what you get:**

- **Three disks:** containing the game, a roster of German, Russian and American infantry and tanks, and nine scenarios. The Mapmaker disk helps you create maps for your own scenarios.
- An extensive **rulebook**, containing all the rules, tactical notes, a tutorial to start you on your first scenario right away, and an index of screen commands.

$59.95

Computer Requirements:

Apple® II family of computers (II+, IIe, or IIc), 64K
One disk drive
Joystick required for II+; optional for IIe and IIc
Mockingboard™ optional
TIME SCALE: varies.
MAP SCALE: From 12 meters/position to 72 meters.
UNIT SCALE: infantry squad, individual tanks and guns.
PLAYERS: One or two, also recommended for team play.
PLAYING TIME: From 10 minutes for a two-squad battle to five hours for 32-squad firefight.
COMPLEXITY: High.
SOLITAIRE SUITABILTY: Very high.

Under Fire is The Avalon Hill Game Company's trademark for its Microcomputer Game of World War II Infantry Combat

Call TOLL FREE:
1-800-638-9292

AH GAMES OF STRATEGY

microcomputer games DIVISION
The Avalon Hill Game Company
4517 HARFORD ROAD, BALTIMORE, MD 21214 (301) 254-9200

Circle 153 on Reader Service Card.

inCider LETTERS

Publisher Terri Hamilton
Editor in Chief Susan Gubernat
Technical Editor Robert M. Ryan
Managing Editor Dawn F. Matthews
Senior Editor Eileen T. Terrill
Review/New Products Editor Paul Statt
News Editor Cynthia K. Carr
Copy Editor Robin Florence
Assistant Editor Lafe Low
Proofreader Peter Bjornsen
West Coast Editor Wendy Lea McKibbin (415) 328-3470

Advertising

Sales Manager/Northeast Sales Representative Paul Boulé (800) 441-4403 (603) 924-7138
Southeast and Central Sales Representative Rich Alden (800) 441-4403
Northwest Sales Representative Donna Pomponi 1060 Marsh Road Menlo Park, CA 94025 (415) 328-3470
Southwest Sales Representative Charles Durham 2082 S.E. Bristol Street Santa Ana, CA 92707 (714) 756-1984
Advertising Coordinator Kim Labbe (800) 441-4403
Marketing Services Manager Michael Duran

Design

Art Director Donna Wohlfarth
Production Supervisor Phyllis Pittet
Production Assistant Cindy Boucher
Ad/Graphics Production Fiona Davies

Graphic Services

Graphic Services Manager Dennis Christensen
Manufacturing Manager Susan Gross
Film Preparation Supervisor Robert M. Villeneuve
Typesetting Supervisor Linda P. Canale

CW Communications/Peterborough

President/CEO James S. Povec
Vice President/Finance Roger Murphy
Assistant General Manager Matt Smith
V.P. of Planning and Circulation William P. Howard
Circulation Manager Frank S. Smith
Direct & Newsstand Sales Manager Raino Wirein (800) 343-0728
Director of Credit, Sales, and Collection William M. Boyer
Executive Creative Director Christine Destrempes
Founder Wayne Green

inCider's BBS (bulletin-board system)
On line 24 hours
(603) 924-9801

Questionable Commands

"Using ProDOS—Part 6" (August 1985) added a new wrinkle to the continuing series of misinformation presented to *inCider* readers. On page 43, Table 2 lists FP and INT as ProDOS commands—not bad, since these commands were never in ProDOS.

Apple Computer no longer publishes two manuals listed on page 44. They're available from Addison-Wesley Publishing—call (800) 238-3801. That company has published the *Technical Reference Manual* since May 15, 1985, and *Basic Programming with ProDOS* since April 15, 1985.

I believe you owe it to your readers to print a sequel to this series—"Using ProDOS, Unpart 1"—to correct the errors presented in parts 1–6. Production versions of ProDOS have been available since January 1984, giving the author more than ample opportunity to check his information before publication. I've been writing you with my comments for several months, and continue to find some of the same incorrect information in print.

Kenneth Kashmarek
6 Cherokee Court
Eldridge, IA 52748

inCider *apologizes for treating FP and INT in the same manner as MAXFILES and NOMON. The former commands are discontinued DOS 3.3 commands that result in ProDOS syntax errors. The latter commands are also discontinued DOS 3.3 commands, but will not produce syntax errors in ProDOS. Apple left these commands in ProDOS to maintain compatibility with DOS 3.3 Applesoft programs, although they don't serve any purpose. Thank you for your update on the* Technical Reference Manual *and* Basic Programming with ProDOS. *—eds.*

Searching Forth

Let me begin by saying that I really enjoy your magazine—I look to *inCider* as a solid source of accurate information.

I am writing about an ordinary problem. Before I purchased my //e, I owned a TI 99/4A. I used Forth with that system and really enjoyed it. Now I'm looking for a solid Forth program for my //e. Few people know anything about Forth, and I can't find any magazine reviews. I'd appreciate any information you could provide on Forth programs for Apples. I'm interested in a system with floating-point, hi-res graphics support and a liberal licensing policy. I'd like to write and distribute software with Forth as the supporting structure.

Anthony D. Alley
PSC Box 147
APO, NY 09321

In "Digital Dialects: A Guide to Apple Languages" (August 1985, p. 14), author Jeff Hurlburt includes a section on the Forth programming language. For more information, write to the Forth Interest Group, P.O. Box 8231, San Jose, CA 95155. —eds.

Enhancing Financing

I don't dispute Robert Alekshun's complaints about Apple Computer (Letters, July 1985, p. 8), nor do I refute *inCider*'s response to him. Apple must expand as any business does. It should be commended for its ability to maintain a large degree of compatibility over the past ten years, when many other companies don't even make an attempt at compatibility in newer models.

The last two sentences in Alekshun's letter show his somewhat childish attitude. He has a considerable investment in his computer. When he is ready to upgrade it, he should "buy Apple." Probably the only item he would have to buy is the main CPU assembly. His disk drives, con-

troller, monitor, printer interface, and cards will most likely be completely compatible with the new CPU. Most, if not all, of his software should also be compatible.

Regarding his complaint about Apple's software working only on newer models, it is widely known that software sells computers. As a marketing strategy, distributing software that utilizes the greater capabilities of a new machine will increase sales of that machine. Apple is in the best position to distribute that software, and certainly can't depend on another company to do it.

I'm also concerned that my "unenhanced" Apple //e will become passé (it has the 6502 microprocessor, instead of the 65C02). As software authors begin using the additional capabilities of the new microprocessor, I won't be able to run certain programs because of that. I would like to get the enhancement, but keep the old chips, an arrangement I understand is against Apple's current policy. With the old chips still installed, I could do a little hardware modification and have a machine with dual processors.

Larry Cline
461 S.E. 39th Avenue
Hillsboro, OR 97123

Your response to Robert Alekshun paints a rosier picture than reality suggests. Many problems exist for owners of the older systems.

I'm a graduate student in comparative literature, and use Apple Writer //e extensively on an "unenhanced" //e (Eve) to prepare reports. My department uses a II Plus, an enhanced //e, and a //c. I consult the members of the department in the matter of purchases because the dealers in our area know so little about third-party products. Trying to find products that work on all these machines is a hassle.

We currently use the older Apple Writer only on the II Plus, and I use the //e version at home. Now the nightmare begins. If you have Apple

TeamMate... Top-Rated in inCider

TeamMate's Apple IIe Subsystems...

"In that category, the dark horse is TeamMate. It's fast, it can use a large-capacity floppy-disk drive either as an additional storage or for incremental backup, and it's just too simple to use to pass up. Consequently, it's my hands-down favorite and my only choice for a business environment needing a stand-alone hard disk."

—Bill O'Brien, inCider Magazine
September 1985

Yes!...TeamMate's Apple IIe Subsystems Now Support ProDOS, DOS 3.3, CPM and PASCAL!

Now your Apple IIe can have the best storage system available, no matter what operating system you use. In fact, you can now run a combination of operating systems on a single TeamMate subsystem!

Replace up to 19 Apple floppies with one TeamMate diskette.

Your Apple IIe can have high capacity data storage like a Winchester while you enjoy the convenience and familiarity of a standard floppy regardless of your operating system. TeamMate's flexible disk drive from Eastman Kodak gives you 2.78 megabytes of data storage on one diskette. You get expandable storage and access to Winchester capabilities...at a very low cost.

TM 2203...A single Kodak flexible disk drive giving you 2.78MB on one diskette.
TM 2206...Two Kodak drives for a total of 5.56MB of online, expandable storage.
TM 2210...10MB of Winchester storage.
TM 2220...20MB of Winchester storage.
TM 2213...A 10MB Winchester combined with the Kodak 2.78MB flexible drive for built-in back-up.
TM 2232...32MB of Winchester storage—the ultimate in high performance mass storage.

TeamMate Model	Quantity 1-2	Quantity 3 +
TM 2203	$ 795	$ 716
TM 2206	$1195	$1036
TM 2210	$ 895	$ 850
TM 2220	$ 995	$ 950
TM 2213	$1495	$1356
TM 2232	$1495	$1356
Kodak Diskettes	$ 15	$ 14

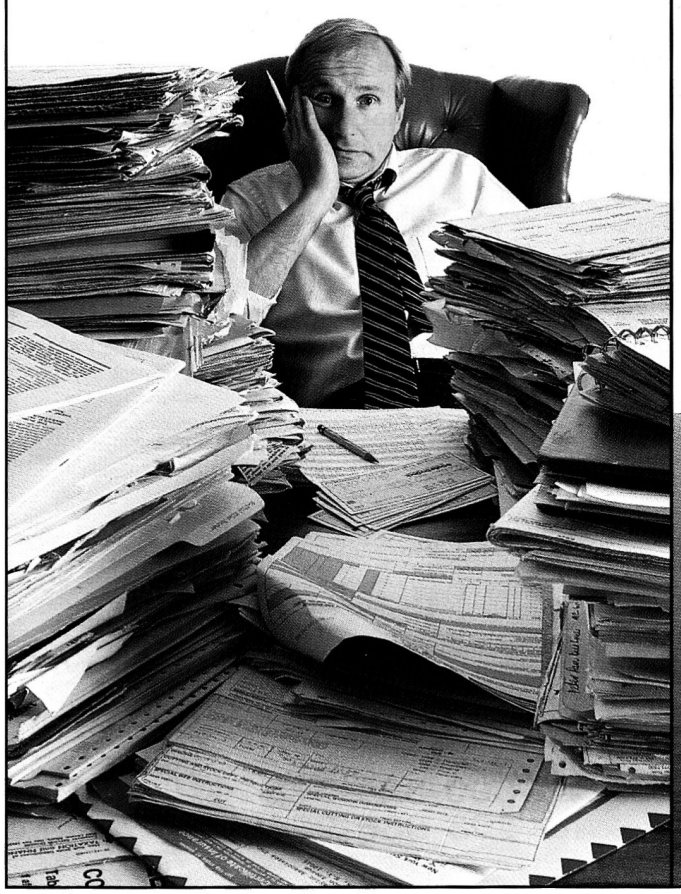
All TeamMate subsystems include drive(s), controller, TeamMate chassis, power supply, necessary cabling, and manual. Kodak subsystems include a Kodak diskette.

Team• Mate

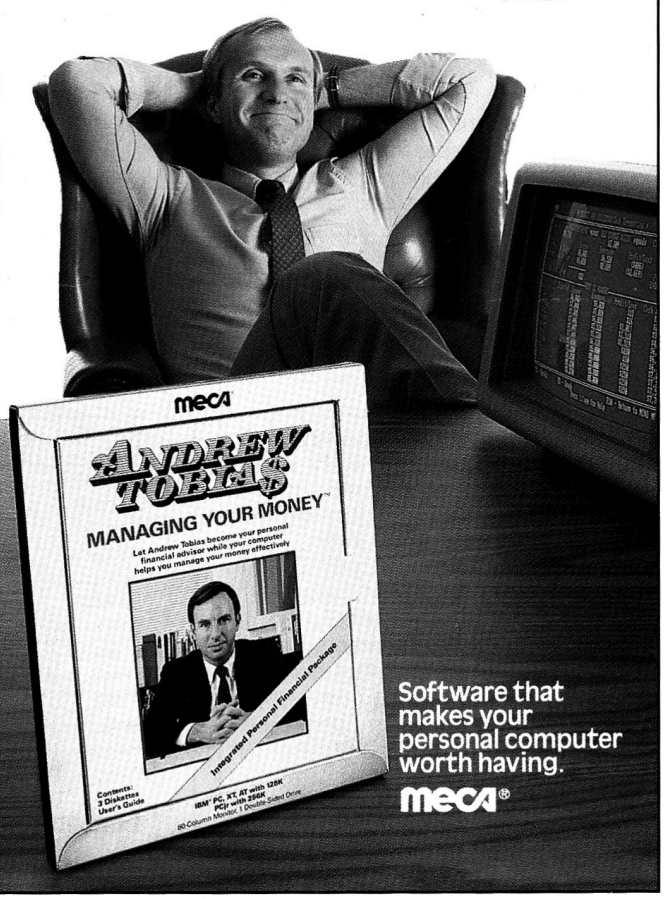
To Order Call: 1-800-824-3724
In California Call: 408-986-9545
Data Technology Corporation 2525 Walsh Avenue Santa Clara, CA 95051

Circle 101 on Reader Service Card.

MANAGING YOUR CHECKBOOK?
MANAGING YOUR BUDGET?
MANAGING YOUR BILLS?
MANAGING YOUR CASH FLOW?
MANAGING YOUR TAXES?
MANAGING YOUR INSURANCE?
MANAGING YOUR STOCKS?
MANAGING YOUR BONDS?
MANAGING YOUR REAL ESTATE?
MANAGING YOUR TAX SHELTERS?
MANAGING YOUR SAVINGS?
MANAGING YOUR MORTGAGE?
MANAGING YOUR AUTO LOAN?
MANAGING YOUR RETIREMENT?
MANAGING YOUR CALENDAR?
MANAGING YOUR CHARGE ACCOUNTS?
MANAGING YOUR CAPITAL GAINS?
MANAGING YOUR ANNUITIES?
MANAGING YOUR APPOINTMENTS?
MANAGING YOUR DIVIDENDS?
MANAGING YOUR INTEREST?
MANAGING YOUR RECORDS?
MANAGING YOUR VALUABLES?
MANAGING YOUR KEOGH'S?
MANAGING YOUR IRA'S?



MANAGING YOUR MONEY®
BY ANDREW TOBIAS.
THE ONLY FINANCIAL
SOFTWARE THAT DOES IT ALL.



Software that
makes your
personal computer
worth having.

meca®

©1985 • MECA • 285 RIVERSIDE AVENUE, WESTPORT, CT 06880 • (203) 222-1000 • For IBM PC, XT, AT, PC jr (256K), TANDY 1200HD, TANDY 1000 (256K), APPLE IIe, IIc (128K, Two Drives)

Circle 105 on Reader Service Card.

Writer II Plus, you do not qualify for the upgrade to the new ProDOS version. If you have Apple Writer //e, you were qualified until August 1, 1985. This means I can get the upgrade, which costs $50, but the office can't. I can't supply the office with a copy without violating copyright laws, so the office must purchase the new version. If it does, every time a file developed on the II Plus is used with the new program, it must be converted to ProDOS. Furthermore, we can't change entirely to the ProDOS version, since that would exclude the II Plus from our system. We could solve all this if Apple would simply make a renewed commitment to the II Plus by providing compatible versions of new programs. My friends, my dealer, and I know of no such programs.

I'm an ardent, loyal fan of Apple computers, but at this point, the relationship is strained.

J. William Hayes
104B Sue Ann Court
Carrboro, NC 27510

Dealership Dilemma

I've recently had a rather severe problem with one of your advertisers. I had some difficulty with the RamWorks memory-expansion card, so I called the manufacturer, Applied Engineering, with a couple of questions. The man to whom I spoke asked me where I had purchased the card. I had ordered it from Coit Valley Computers (Dallas, Texas), and when I told him, he refused to give me any information. He said he could lose his job if he did, and implied that I may not have a "legitimate" card.

I have never heard of anything like this before. Obviously, Applied Engineering is having some sort of problem with its distributors or dealers, and seems to feel that I should be the one to pay for it.

While I realize Applied Engineering is a major advertiser in your magazine, I hope you feel an obligation to your readers to look into such an unethical, overtly hostile policy.

David Parsons
310 West 72nd Street
New York, NY 10023

My company, Coit Valley Computers, has recently had some bad experiences with Applied Engineering, manufacturers of the RamWorks card.

I contacted the firm about opening an account and was flatly rejected. I suspect it was because I sell at a mail-order discount and would compete with the company. I obtained the product through another of Applied's few dealers. This method of obtaining a product is very common for many retail operations.

Soon after, Applied Engineering placed an ad in a local Apple magazine; the ad warns that the company may not honor its three-year, "no hassle" warranty if customers don't buy cards directly from Applied Engineering or an authorized dealer. The ad further cautions customers to be suspicious if prices are below normal or are quoted by a mail-order firm. The following week I was contacted by a customer who said the people at Applied Engineering had rudely refused to even answer a minor technical question or honor the warranty, because they found out he had purchased the card from me. Since RamWorks packages do not mention one word about any warranty, it would appear that Applied Engineering's three-year, "no hassle" warranty, seen only in ads, is both subject to any interpretation Applied Engineering cares to use, and is anything but "no hassle."

Coit Valley Computers would like to reassure its customers that we will honor any warranty that Applied Engineering refuses to on Applied products purchased from us. We have also discontinued Applied Engineering products in favor of Checkmate Technology products.

Michael B. Norton, D.V.M.
Coit Valley Computers
14055 Waterfall Way
Dallas, TX 75240

Applied Engineering has ended its policy of denying support to customers who don't buy through its company or an authorized dealer. According to Dan Pote, Applied Engineering urges consumers to buy from an authorized source, but the company will not penalize those who don't. —eds.

---

inCider *welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters,* inCider, *80 Pine Street, Peterborough, NH 03458.*

MANAGING YOUR MONEY® IS NOW AVAILABLE ON APPLE IIe AND IIc.

Special Introductory Edition!

Contains both 5¼" and new 3½" UniDisk 3.5® disk formats

APPLE IIe, IIc (128K, 80-Column Monitor, Two Drives)

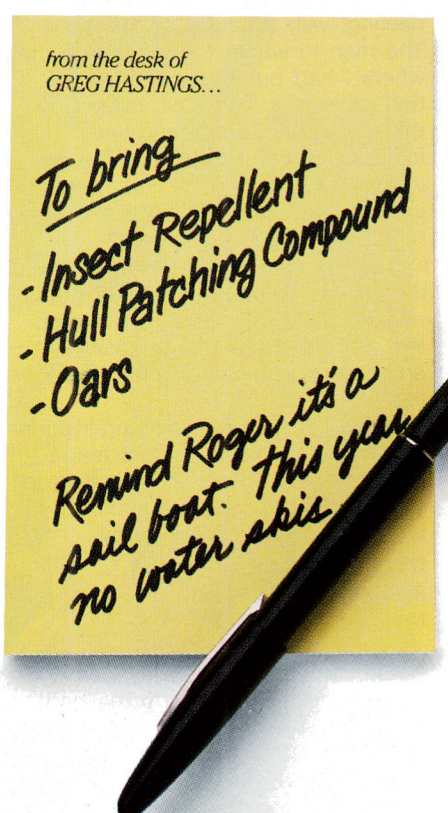
AppleWorks

Only Pinpoint adds pictures to any AppleWorks document. So you can create party invitations that are truly exciting. Even if the weather isn't.

One glance and you can see your social schedule for months ahead. So it's a snap to slip this year's party in between the garlic festival and your breakdancing lessons.

Don't spend hours addressing envelopes and misspelling names. Pinpoint picks up names and addresses from invitations (or any documents) and drops them, letter perfect, onto envelopes. Even if you don't always spell those tongue-twisting names right, at least you'll be consistent.

Jot down important thoughts whenever they strike. The note pad is perfect for reminding you of things you can't do without. Or things you can.



Impress a friend with a personal invitation. It's easy. The automatic dialer finds phone numbers displayed anywhere on the screen, not just in special files.

And it re-dials busy numbers automatically. So you're next in line as soon as your friend's broker hangs up.

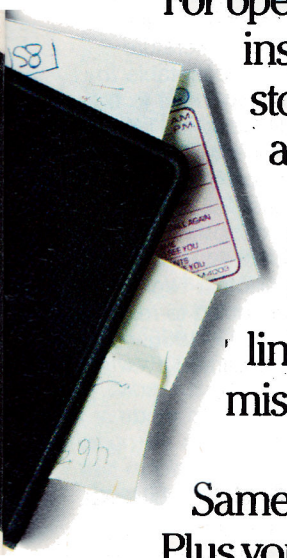
© 1985 Pinpoint Publishing
AppleWorks, ProDOS, UniDisk 3.5, and Enhan
Memory Card are trademarks, while Apple is
registered trademark, of Apple Computer, Inc.

Circle 133 on Reader Service Card.

Accessories. $69.

Nine accessories to be precise. And in no time, they'll be so much a part of your AppleWorks routine, you'll think of them as built-in, not added-on. Why?

For openers, these handy desktop timesavers "pop-up" via windows from inside AppleWorks *(and most other ProDOS programs)*. So you can stop what you're doing to jot down a note, address a letter, or call a friend.



You can even figure out some figures with our calculator. Tap data bases or other computers through our communications window. Even whip out short memos, forms and labels with our line-at-a-time typewriter. And then continue AppleWorks without missing a beat. Or a byte.

What's more, Pinpoint's as easy to use as AppleWorks itself. Same commands. Same hardware.

Plus you can boost Pinpoint's performance by adding an Apple Extended Memory Card, the new, high-capacity UniDisk 3.5 floppy, a hard disk, a modem, or one of many popular printers. And with our Pinpoint Toolkit, you can even add desktop accessories of your own.

Want more?

Then visit your local computer shop.

Or call (415) 530-1726 for a dealer near you. You'll see that Pinpoint does more than give AppleWorks a handful of accessories.

It gives AppleWorks the works.

SPECIAL PURCHASE– MAXIMUM PERFORMANCE BUNDLES

10MB SIDER Hard Disk, Siderware, plus Pinpoint for only	*$660.00*
20MB SIDER Hard Disk, Siderware, plus Pinpoint for only	*$960.00*
Pinpoint, plus 256K RAM for RamWorks/Multi-Ram/Apple	*$100.00*
64K RAMWORKS, AppleWorks Expander Software, plus Pinpoint	*$218.00*
64K RAMWORKS, AppleWorks Expander, Pinpoint, plus 256K RAM	*$278.00*
512K RAMWORKS, AppleWorks Expander Software, plus Pinpoint	*$318.00*
1Meg RAMWORKS, AppleWorks Expander Software, plus Pinpoint	*$408.00*
256K Z-RAM, AppleWorks Expander Software, plus Pinpoint	*$418.00*
512 Z-RAM, AppleWorks Expander Software, plus Pinpoint	*$468.00*

FAMOUS BRAND MODEMS, Bundled with Pinpoint

Prometheus 1200A, 1200 Baud External	*IIc/IIe*/MAC*/IBM**	*$368.00*
Prometheus 300c, Compact 300 Baud External	*Mounts on the IIc*	*$208.00*
Volksmodem 1200, 1200 Baud External	*IIc/IIe*/MAC*/IBM**	*$238.00*
ZOOM IIe, 300 Baud Internal	*IIe/Enhanced IIe*	*$188.00*

**Requires $10-15 cable and/or serial interface card, Subject to availability and price changes. Most items available from your dealer.*

NEWS LINE

by Cynthia K. Carr, *inCider* staff

Making Par

Tee off anytime before April 30, 1986, and you could win $17,000 in prizes from 1 Step Software's World Golf Hall of Fame Benefit Tournament. And the best part is you don't need a caddy to take in the 18 holes. The tournament comes packaged with Golf's Best Course Simulator Series from 1 Step Software. Golf's Best presents the golfing challenges found on the Pinehurst Hotel's famous No. 2 course in the sandhills of North Carolina.

To enter the tournament, send your best round on disk to 1 Step Software. You can play the course as often as you like, but tournament officials allow only one entry per person. The computer-golf simulation includes hazards, sloping greens, deep bunkers, and fairways.

"The response has been tremendous," President Martha Sharp says. "We've heard of people buying a computer just so they could play Golf's Best and the tournament."

The tournament winner earns entry into the 1986 World Golf Hall of Fame Pro-Am Invitational and a trip for two to Pinehurst. Other finishers will receive golf clubs, bags, and various prizes.

For more information, contact 1 Step Software, Charlotte Plaza, Suite 1300, Charlotte, NC 28244, (800) 525-GOLF, or (704) 554-7255 in North Carolina.

Long Arm of the Law

Lawmakers in California are setting a precedent other states may soon follow—a precedent not favored by the computer industry. The California legislation, Assembly Bill 1507, establishes tougher warranties on the sale or lease of all new computer hardware and software costing $25,000 or less.

Introduced by California Assembly member Gloria Molina, the bill prohibits manufacturers and sellers from assigning disclaimers on product warranties. Also, manufacturers would have to honor products with full refunds up to one year from purchase.

While Molina explains that the proposed law protects the consumer, *InfoWorld* reports the bill would make vendors pay twice the cost of the product, plus attorneys' fees if a consumer followed through with legal action.

If AB 1507 becomes law, every computer dealer and manufacturer selling its products in California will have to rewrite marketing and ad copy to conform to new legal guidelines and restrictions. This policy extends to manuals, sales literature, point-of-sale materials, brochures, and documentation. Literature that is legally acceptable in other states may have to be altered to fit California law.

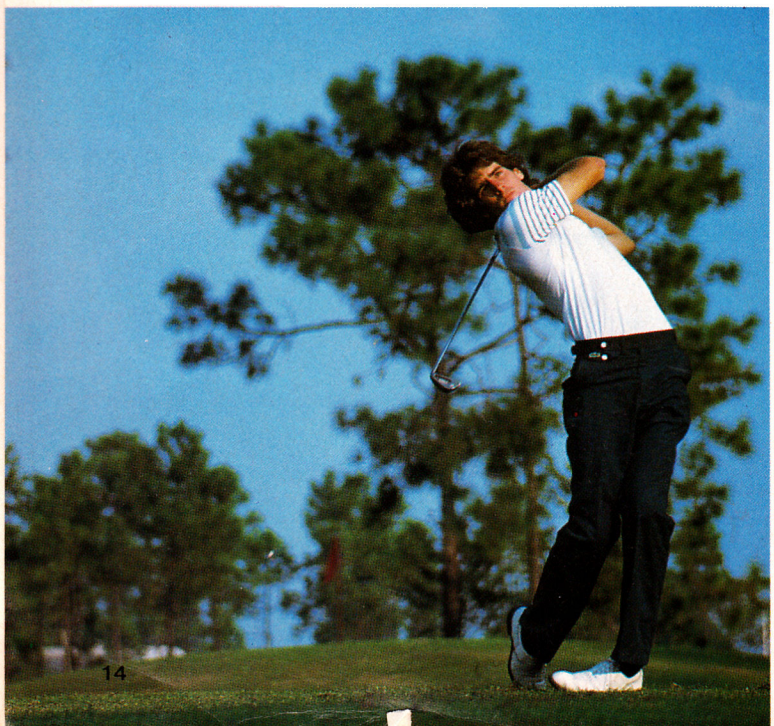
AB 1507 went before a state-Senate committee hearing on August 21, 1985, but because of opposition the bill was tabled. At press time, the California Legislature was scheduled to recess on September 13, 1985, so the bill will be carried over to the 1986 session.

Changing of the Guard

Apple Computer marks a new era in 1986 with the resignation of co-founder and chairman of the board Steven P. Jobs in September.

Jobs, who was relieved of day-to-day responsibilities in the corporation's restructuring this past May, will

Photo by COMSTOCK, INC./R. MICHAEL STUCKEY



INSIDE OUT

● **Give away. . .**As part of a $350,000 educational campaign, Corvus and other software vendors are awarding ten school systems an Omninet network, a 45-megabyte hard disk, back-up system, print enhancement capabilities, and software. The program runs until November 29, 1985, and educators must have at least five Apple computer systems. Winners will be announced in December.

● **That's entertainment. . .**Despite the softening home-computer software industry, the market for home-entertainment software isn't petering out. Dataquest, a research firm, estimates that entertainment-software sales will escalate from about eight million units in 1984 to almost 14 million in 1989.

● **Helping out. . .**Program administrators at Eastern Kentucky University and Madison County Schools plan to use graphics, animation, and videotapes combined with teletext to help deaf and multiply handicapped teenagers learn sign language, reading and language skills. The program was made possible through an equipment grant from Apple Computer.

—Wendy Lea McKibbin
inCider *staff*

Photo of Johannesburg, South Africa by COMSTOCK, INC./ HARTMAN-DEWITT

start a new company aimed at developing computers for universities. According to *The Wall Street Journal*, such a computer would appeal to many universities looking for machines that go beyond what personal computers can offer. At press time, Jobs had not revealed the company's name.

Jobs' resignation startled members of the board when he announced that five Apple employees would join his new venture. They are: Rich Page, a senior engineer; Daniel Lewin, manager of education marketing; Bud Tribble, manager of software engineering; George Crow, manager of hardware engineering; and Susan Barnes, controller for sales and marketing.

The announcement came after industry sources speculated that Jobs' stock sale during the summer indicated his plans to move into politics or a new business. No sooner had Jobs filed with the Securities and Exchange Commission to sell 850,000 shares of Apple stock than he filed to sell another 500,000 shares. The sale represents 19.7 percent of his stock holdings.

Even after selling the stock, Jobs will still own 9 percent of Apple stock and remain the Cupertino-based company's largest stockholder.

Apart No More

Apple Computer joins the growing number of organizations discontinuing business relations with South Africa because of that government's policy of apartheid.

According to the computer company, the sales restriction was to become effective October 31, 1985, when its contract with the South African distributor ends. The announcement concludes six years of business transactions between Apple and South Africa.

Micro Marketworld reported that Apple Computer International in Paris, the company's new international division, originated the proceedings and received approval from company headquarters in Cupertino, California.

High Cost of Change

Apple Computer's reorganization and consolidation of its operations last spring left the company with its first quarterly loss. The maneuvering, as reported for the quarter ending June 28, cost Apple $40.3 million, resulting in a net loss of $17.2 million.

Apple reported that plant and equipment write-downs, facility-lease cancellations, and compensation were among the reorganization expenses. The $40.3 million figure was larger than industry analysts anticipated.

The quarterly report also indicated that net sales were down 11 percent from last year. And a recent *InfoWorld* article reported that President John Sculley expects sales to "remain soft through Christmas."

We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line, inCider, *80 Pine Street, Peterborough, NH 03458.*

CALENDAR

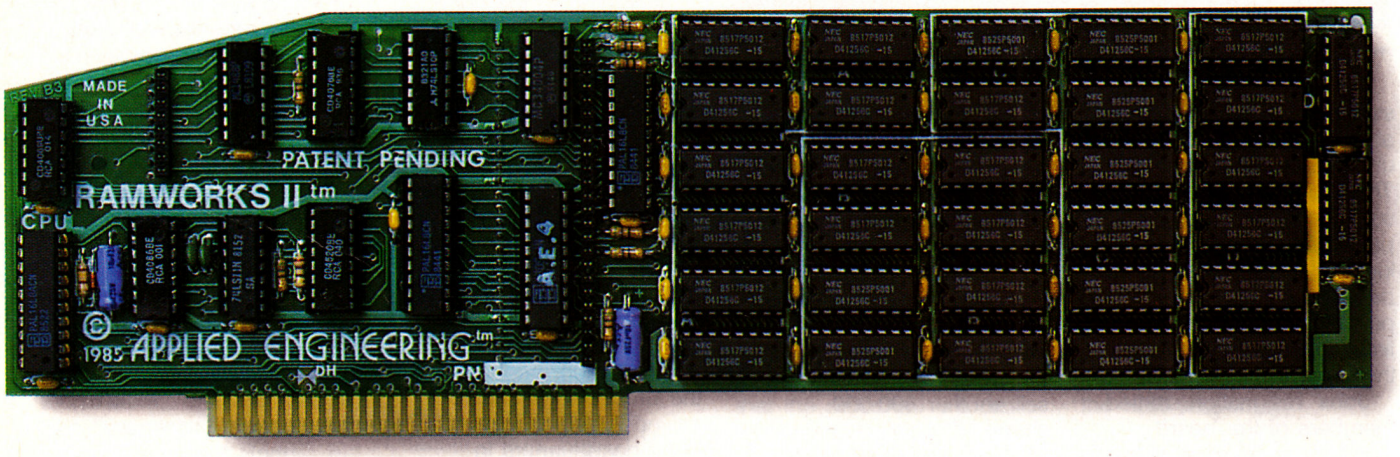
December 3–6
MICROCOMPUTER SYSTEMS IN GOVERNMENT
Washington, DC
contact:
Conference Manager
U.S. Professional Development Institute
1620 Elton Road
Silver Spring, MD 20903
(301) 445-4400

December 4–5
CALIFORNIA COMPUTER SHOW
Palo Alto, CA
contact:
Norm DeNardi Enterprises
289 South San Antonio Road
Suite 204
Los Altos, CA 94022
(415) 941-8440

December 5–7
THE ASSOCIATION FOR PERSONS WITH SEVERE HANDICAPS—NATIONAL CONFERENCE
Boston, MA
contact:
Hiroko Roe
TASH
7010 Roosevelt Way N.E.
Seattle, WA 98115

Meet RamWorks II™

The Recognized Industry Standard For Memory Expansion of the Apple IIe.



RamWorks II. A Generation Ahead. Again.

The best selling expansion card for the Apple IIe just got even better. With RamWorks II, expand your IIe to an incredible 3 megabytes of usable RAM.

Turbo Charged AppleWorks.

RamWorks II plugs into the IIe auxiliary slot and acts just like Apple's extended 80 column card, only better—because if you buy a 256K or larger card, AppleWorks will automatically load itself into RamWorks II. This dramatically increases AppleWorks' speed and power because it effectively eliminates the time required to access disk drive 1. Now, switch from word processing to spreadsheet to database management at the speed of light. AppleWorks responds the moment your fingers touch the keyboard.

But AppleWorks has certain internal limits, independent of available memory. Fear not. Only RamWorks II (and the original RamWorks of course) removes those limits. Only RamWorks II increases the maximum number of records available from 1,350 to over 16,000. Only RamWorks II actually increases the number of lines permitted in the word processing mode. And only RamWorks II features a built-in printer buffer, so you no longer have to wait for your printer to stop before going back to AppleWorks (256K or larger RamWorks II required).

With RamWorks II, you won't have to split your data into 2 or more separate files because you'll have the necessary memory to access ALL your data ALL the time, quickly and conveniently.

RamWorks II	AppleWorks Desktop
128K	101K
256K	188K
512K	378K
1 MEG	758K
1.5 MEG	1136K
3 MEG	2277K

The Most Friendly, Most Expandable Card Available.

RamWorks II is compatible with more off-the-shelf software than any other RAM card. Popular programs like Advanced VisiCalc, Magic Office System, Flashcalc, The Spread Sheet, Diversi-DOS, Supercalc 3A, Magicalc, etc. (and hardware add-ons like Profile and Sider hard disks). Fact is, only RamWorks is 100% compatible with all software written for the Apple 80 column and extended 80 column cards. In addition, RamWorks II can emulate most other RAM cards, so you can use programs written for them without modification. And any size RamWorks II can be user upgraded later to any larger size.

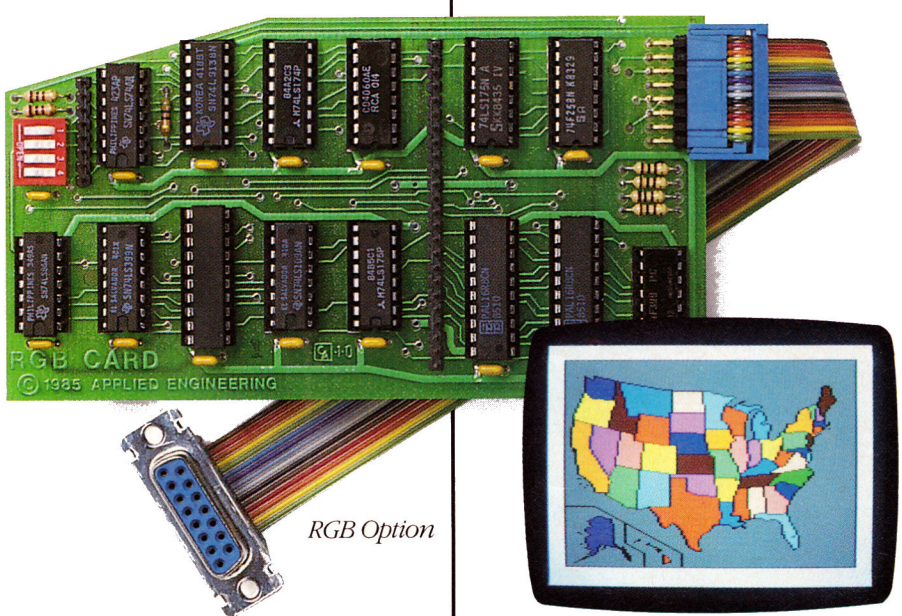
RamWorks II was designed so you could take full advantage of future developments in 16 and 32 bit microprocessors. As your needs grow, so can RamWorks II. A handy coprocessor connector allows the latest and greatest coprocessor cards to access all 3 MEG

of RamWorks II memory. And speaking of more memory, RamWorks II has a memory expansion connector on board so a low profile (no slot 1 interference) memory expansion card can add another 512K or 2 MEG of memory.

Should you ever run low on memory with RamWorks II (unlikely) you can add these expander cards to your RamWorks II at any time. And of course, these expander cards are compatible with original RamWorks too.

It's In Color.

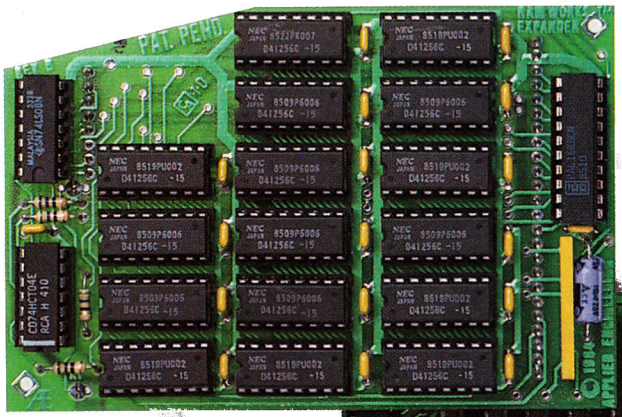
The same slot that's used for memory expansion is also the slot that's used for RGB color display. RamWorks II lets you decide later to add RGB color. For only $129, an RGB option can be added to RamWorks II to give you double high resolution color graphics and 80 column text. All with razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of RamWorks II with no slot 1 interference (works on the original RamWorks, too) and attaches to any Apple compatible monitor. And remember. You can order the RGB option with your RamWorks II. Or add it on at a later date.



RGB Option

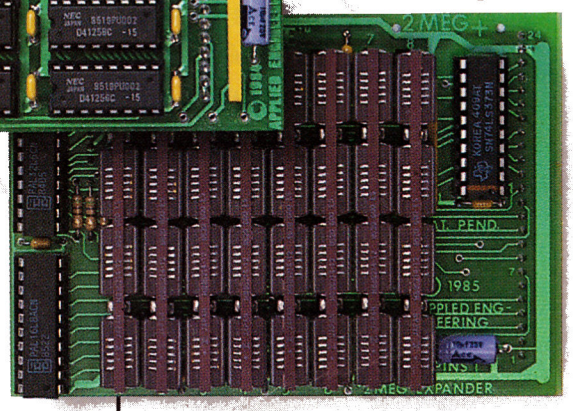
It Corrects Mistakes.

Let's say you bought some other RAM card (and that's a mistake) and your RAM card is not being recognized by AppleWorks, Advanced Visicalc, Flashcalc, Supercalc 3A, or other programs, and you want RamWorks II.



512K Expander

2 MEG Expander



No problem. The memory chips on the card that you now have, which is where most of the money is, can be unplugged and then plugged into the expansion sockets on RamWorks II.

It's Got It All.

- 15 Day Money Back Guarantee
- Super sharp 80 column text (patent pending) with or without RGB option
- Double high resolution graphics (with or without RGB option)
- Expandable up to 1 Meg (1024K) on main board
- Expandable to 3 Meg (3072K) with expander (piggyback) card
- Can use 64K or 256K RAMS in any combination
- Linear addressing coprocessor port
- Automatic AppleWorks expansion up to 2205K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
- RAMDRIVE™ the ultimate disk emulation software included free
- 16 Bit option
- Compatible RGB option
- Built-in self diagnostics software
- No slot 1 interference
- Lowest power consumption (patent pending)
- Takes only one slot
- Software industry standard
- Advanced Computer Aided Design
- Used by Apple Computer, Steve Wozniak and virtually all software companies
- 5 Year no hassle warranty

RamWorks II with 64K	**$ 179**
RamWorks II with 256K	**$ 219**
RamWorks II with 512K	**$ 269**
RamWorks II with 1 MEG	**$ 389**
RamWorks II with 1.5 MEG	**$ 549**
RamWorks II with 3 MEG	**$1699**
RGB Option (may add later)	**$ 129**
16 Bit Option (may add later)	**$ 89**

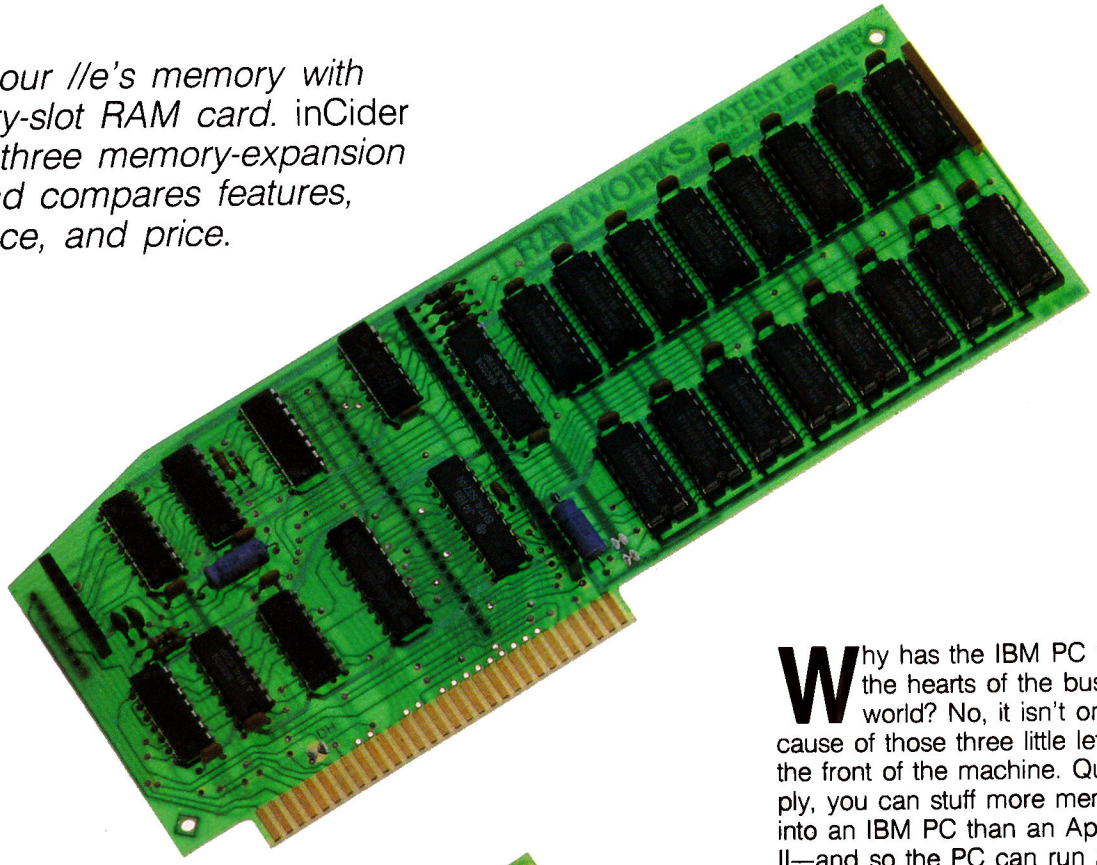
RamWorks II. Like the original, it's rather extraordinary. But then some things never change.

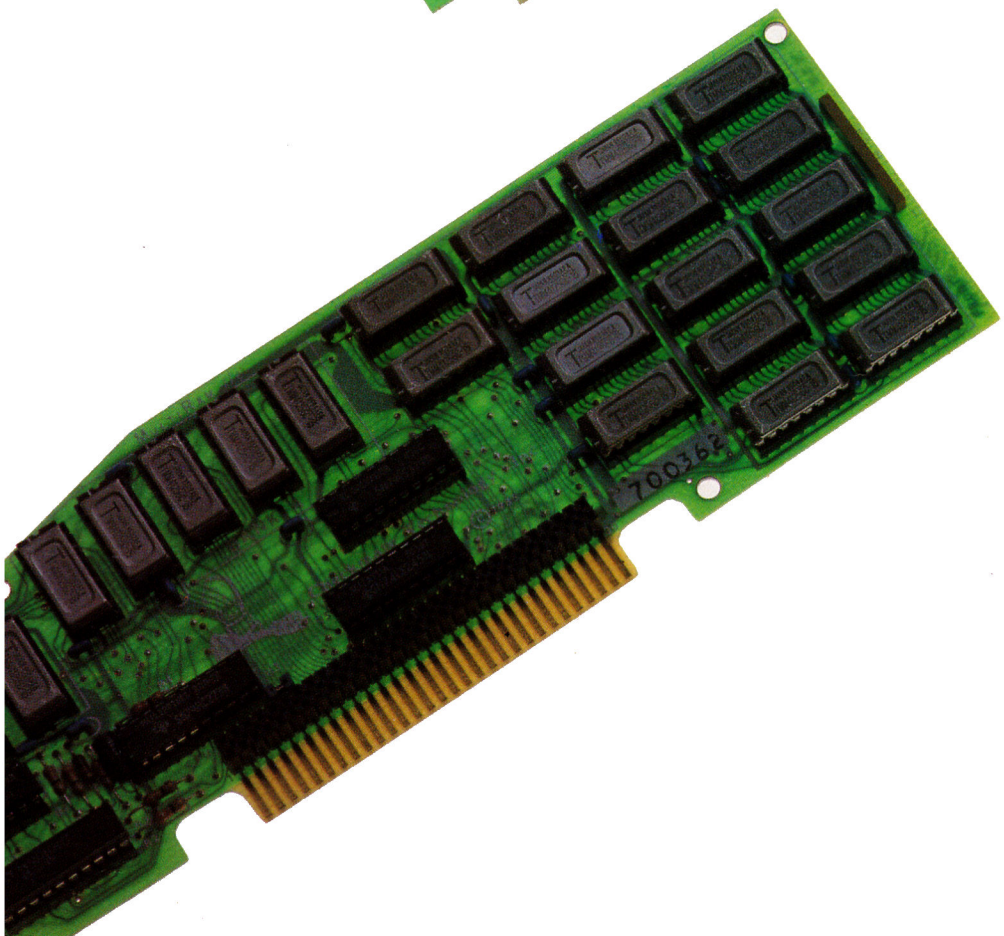
ORDER YOUR RamWorks II TODAY. 9 a.m. to 11 p.m. 7 Days, or send check or money order to Applied Engineering.

MasterCard, Visa and C.O.D. welcome. Texas Residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

Applied Engineering
P.O. Box 798, Carrollton, TX 75006
(214) 241-6060

Improve your //e's memory with an auxiliary-slot RAM card. inCider *evaluates three memory-expansion boards and compares features, performance, and price.*





Why has the IBM PC won the hearts of the business world? No, it isn't only because of those three little letters on the front of the machine. Quite simply, you can stuff more memory into an IBM PC than an Apple II—and so the PC can run more powerful software than the Apple. But the Apple //e is now closing the "memory gap," thanks largely to the three memory-expansion boards I'll evaluate in this article: Applied Engineering's RamWorks II, Checkmate Technology's MultiRam //e, and the E' Card from Legend Industries.

These RAM cards slip into the auxiliary slot of the //e. There they have direct access to the machine's video circuitry and firmware, and, more importantly, they can take advantage of the bank-switching scheme built into the //e. Bank-switching lets the //e overcome the most serious deficiency of the Apple's microprocessor—its 16-bit address bus.

Magic Bus

What's wrong with 16 bits? Nothing, if you're talking about the number of data bits a microprocessor can handle. A 16-bit

THANKS FOR THE MEMORY

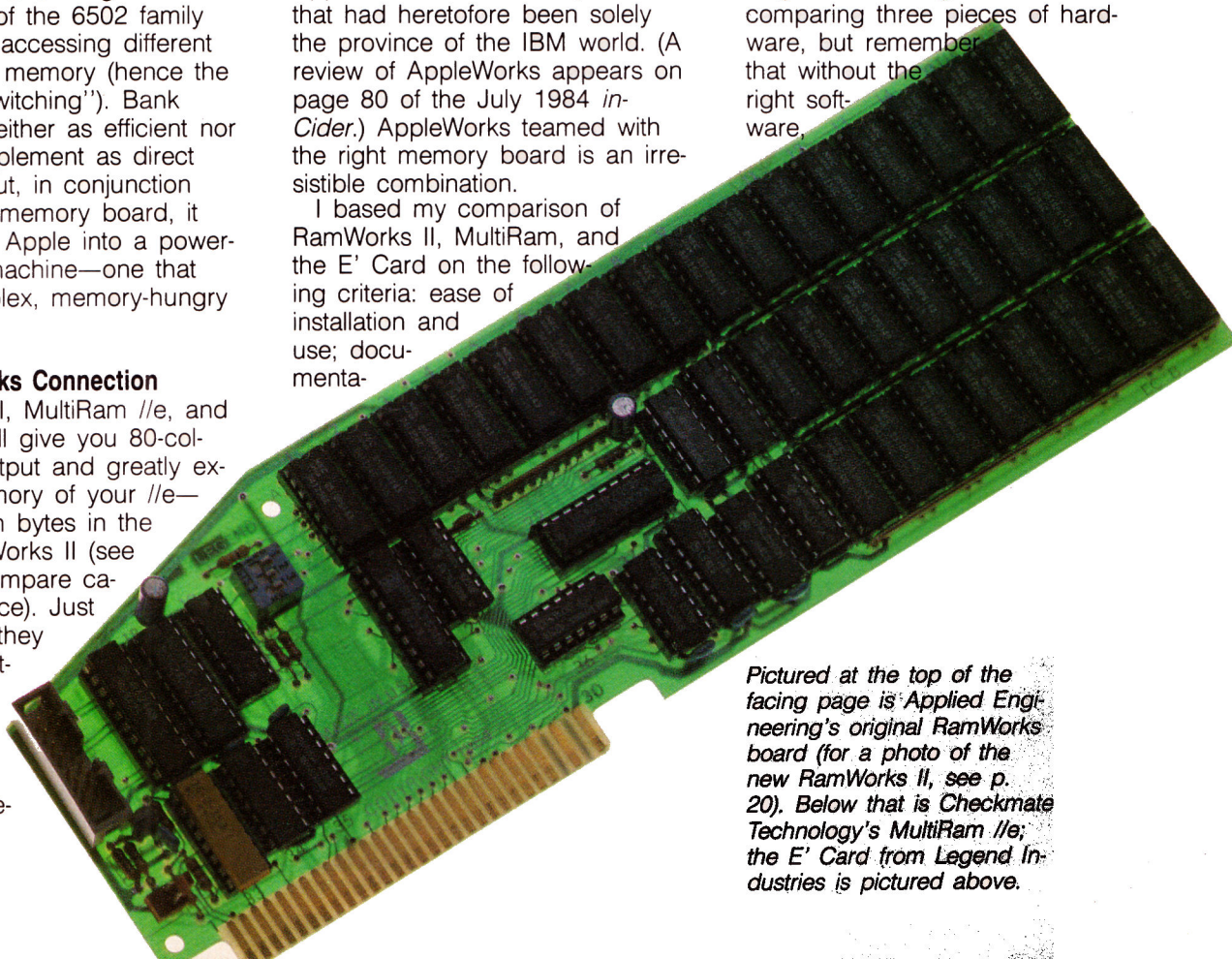
by Bob Ryan, *inCider* Technical Editor

address bus, though, can access only 65,536 bytes (64K) of memory at one time. The IBM PC has a 20-bit address bus, circumventing the 64K memory restriction. The Apple //e and //c get around the 64K limit of the 6502 family by alternately accessing different 64K banks of memory (hence the term "bank switching"). Bank switching is neither as efficient nor as easy to implement as direct addressing, but, in conjunction with the right memory board, it can turn your Apple into a powerful business machine—one that can run complex, memory-hungry software.

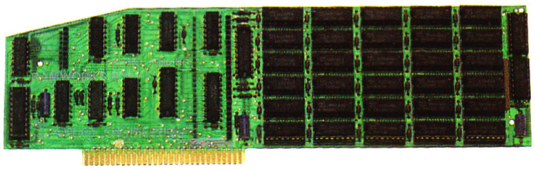
The AppleWorks Connection

RamWorks II, MultiRam //e, and the E' Card all give you 80-column video output and greatly expand the memory of your //e—up to 3 million bytes in the case of RamWorks II (see **Table 1** to compare capacity and price). Just as important, they come with software that lets AppleWorks—the most popular package among serious Apple users—take advantage of all that extra memory. AppleWorks incorporates a data-base manager, spreadsheet, and word processor in one package, thereby giving Apple users the kind of power that had heretofore been solely the province of the IBM world. (A review of AppleWorks appears on page 80 of the July 1984 *inCider*.) AppleWorks teamed with the right memory board is an irresistible combination.

I based my comparison of RamWorks II, MultiRam, and the E' Card on the following criteria: ease of installation and use; documentation and support; performance; and—of critical importance—compatibility with AppleWorks (see **Table 2** for a summary of the evaluation). It may seem strange to give such weight to software in comparing three pieces of hardware, but remember that without the right software,



Pictured at the top of the facing page is Applied Engineering's original RamWorks board (for a photo of the new RamWorks II, see p. 20). Below that is Checkmate Technology's MultiRam //e; the E' Card from Legend Industries is pictured above.



Applied Engineering's RamWorks II card

the most impressive piece of hardware is just so much silicon and plastic.

Installation and Use

As mentioned above, each of these boards fits into the auxiliary slot of the //e. In each case, the installation process is easy—it's impossible to put these boards in backwards. Plugging in the E' Card is a little more involved because its standard version comes with two features that are optional or not available on the other cards—RGB color output and 16-level grey-monochrome output. You must attach two cables to the E' Card to access these features—but that's simple to perform.

Once you've installed these boards, you won't have to touch them again. All three use the //e's 80-column firmware, so software written for Apple 80-column cards works with these boards. If you do any program development, though, MultiRam has a slight advantage over the other two boards: four LEDs that let you see which bank of memory the microprocessor is currently addressing.

Documentation and Support

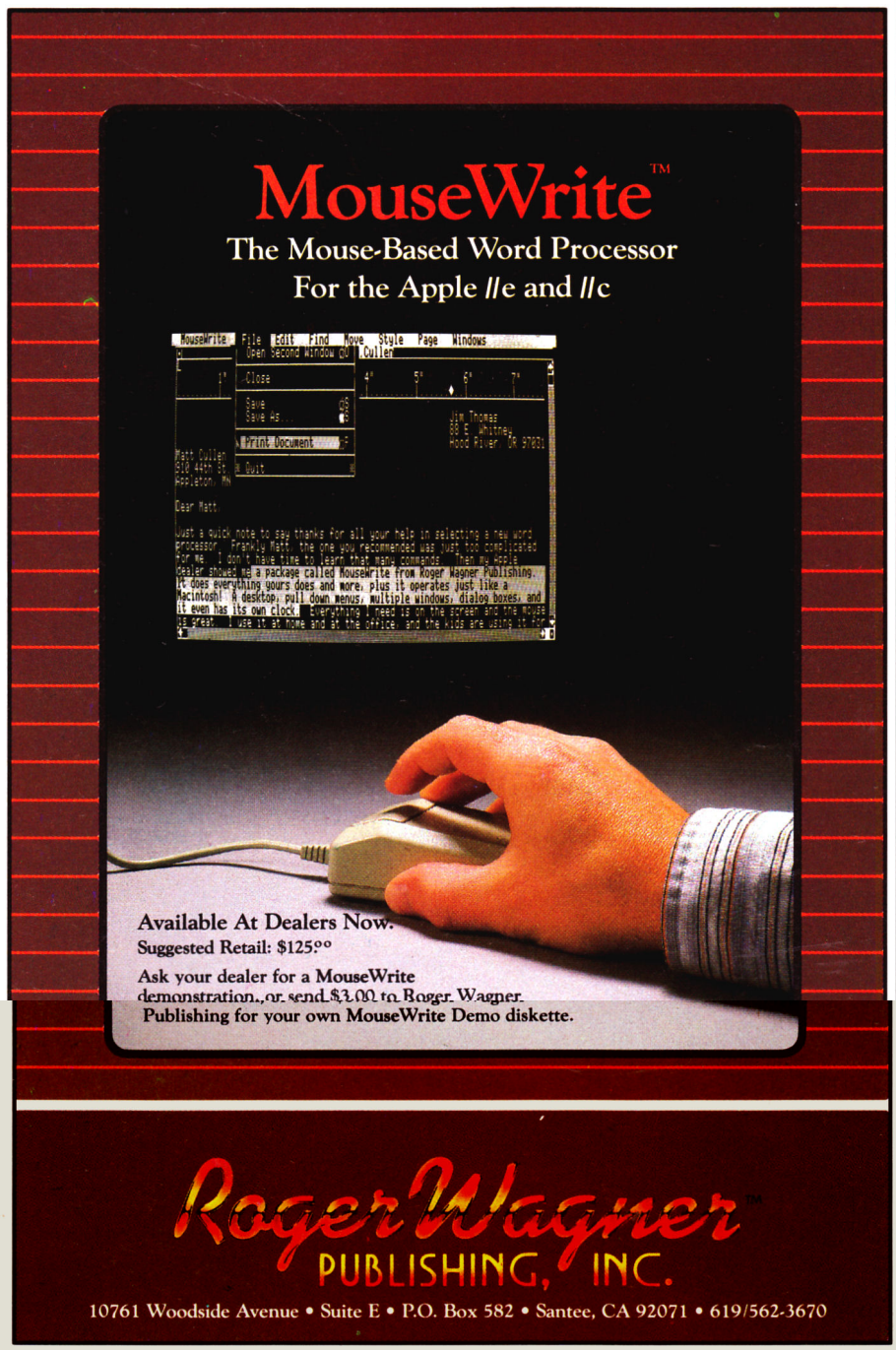
Without doubt, MultiRam comes with the best documentation. The manual contains just about all you'll ever need to know about the card and its operation, including how to program the card, how to manually segment large AppleWorks files, and how to get the most out of your Apple system. It's beautifully organized and well written—all in all, one of the better manuals I've seen.

Support for MultiRam is also exceptional. The package includes a five-year warranty you can extend for another five years for an additional $25. Registered owners can call Checkmate Technology's help line during business hours for the cost of the phone call.

The RamWorks II documentation is very good, but not as complete as MultiRam's. Much of the material on the operation of Applied Engineering's AppleWorks expansion software is found not in the manual, but on the disk itself. This arrangement is bothersome if, for example, you forget how an AppleWorks file is segmented and need that information quickly. I want documentation I can hold in my hand.

Like Checkmate, Applied Engineering now offers a five-year warranty on its board. It also provides free telephone help. In the past, Applied Engineering has restricted its support to those people who purchased their RamWorks boards directly from Applied or from an authorized dealer. Reportedly, this qualification no longer applies.

Of the three cards, Legend's



Give The Gift Of Education

Keyboarding software from South-Western. The perfect gift for the whole family.

KEYBOARDING ALPHA-PAC and MICROTYPE, THE WONDERFUL WORLD OF PAWS make learning how to keyboard the right way fun—and effective.

Designed for children ages 8 to 12, MICROTYPE, THE WONDERFUL WORLD OF PAWS uses "PAWS," an animated cat, to teach basic keyboarding skills.

And, for adult learners, KEYBOARDING ALPHA-PAC uses animated graphics to demonstrate which fingers should strike which keys and show correct hand position.

Get the most out of your family computer, order these unique software packages for this holiday season!

To order your software packages, fill out this form and return it today!

Please send me:

_____ copies of **MICROTYPE, THE WONDERFUL WORLD OF PAWS** at $39.95* each ☐ Apple® II Plus, IIe, IIc ☐ Commodore 64™ ☐ IBM PC, PCjr®

_____ copies of **KEYBOARDING ALPHA-PAC** at $39.95* each ☐ Apple® II Plus, IIe, IIc ☐ Commodore 64™ ☐ IBM PC, PCjr® ☐ TRS-80™ Models III and 4 ☐ Tandy® 1000

_____ Enter total cost of all software ordered

_____ Add 6% for shipping and handling, plus local sales tax

_____ TOTAL PRICE

Name _____

Address _____

City/State/ZIP _____

☐ MasterCard ☐ VISA

Card No. _____ Expires _____

Cardholder's Name _____

Cardholder's Phone No. _____

Cardholder's Signature _____

☐ Check enclosed for $_____

*Price subject to change without notice

Customers outside the U.S. or its possessions should contact our office for the nearest agent or distributor before placing an order.

South-Western Publishing Co., ATTN: Consumer/Professional Products Division, 5101 Madison Road, Cincinnati, Ohio 45227

Circle 164 on Reader Service Card.

Great Games for Great Game Players

RELAX and PLAY the Prizewinning Computer Bridge Programs

For Apple, C64, IBM Compatibles

Tom Throop's Bridge Baron™
Winner of the First Computer Bridge Tournament

Bid, play, or bid and play over a million random deals in the strongest computer bridge playing program available on major computers.
C64 $39.95 All others $49.95

Play Bridge with Sheinwold™
Winner of the Consumer Electronic Software Award 1985

Improve your declarer play as you are guided along correct play in 91 challenging deals designed by Alfred Sheinwold and accompanied by an 185 page book written in his entertaining style.
$29.95

(Also available for the Atari 800)

Here is what the experts say:

Alan Truscott—Bridge Editor of the New York Times—"BRIDGE BARON *is the most advanced bridge program in the country.*"

Alfred Sheinwold—Noted columnist and author—"*Tom Throop...the most knowledgeable person in the world on the combination of bridge and computer science.*"

Purchase through participating retailers, or order directly from

GREAT GAME PRODUCTS™.

Please print or type

NAME

ADDRESS

CITY STATE ZIP

( )
TELEPHONE ICD

FORM OF PAYMENT

☐ Check enclosed. (Make check or Money Order payable to GREAT GAME PRODUCTS).
☐ Visa ☐ MasterCard

CARD# EXP. DATE

SIGNATURE

☐ Please send me additional information on other GREAT GAME PRODUCTS.

	# Copies	Format	Total
Bridge Baron	_____	_____	$_____
Sheinwold	_____	_____	$_____

Add $2.50 Shipping/Handling for each copy.

Order Now by Telephone for Holiday Delivery: **800/GAMES 4 U** (800/426-3748) or Mail to: **Great Game Products**, P.O. Box 76, Cabin John, MD 20818-0076

Table 1. RAM capacities and prices of three memory-expansion boards.

Capacity	E' Card	MultiRam //e	RamWorks II
64K	$299	$159.95	$179
256K	$419	$289.95	$249
512K	$519	$359.95	$319
768K	$644	$429.95	NA
1M	$769	NA	$519
1.5M	NA	NA	$719
3M	NA	NA	$1699

Note: Chip prices are constantly falling. Check with the manufacturer for the latest prices. NA indicates that the manufacturer does not make the specified memory board.

E' Card has the poorest documentation. Although it contains a complete section on installing the card, much of the text is repetitious. Also, the documentation doesn't explain how to segment large AppleWorks files over multiple data disks. What good is having a 300K data-base file if you can't save it to your 140K Apple disks?

Performance

To check on the speed of the hardware and the efficiency of the AppleWorks expansion software, I created a 180K AppleWorks spreadsheet and kept track of the time it took each card, running its own software, to recalculate the spreadsheet. I used simple N = N + 1 formulas throughout the spreadsheet. **Table 3** shows the results of this test. The E' Card and software enjoys a small speed advantage over the other two boards. RamWorks II and MultiRam exhibited virtually the same performance.

The quality of the 80-column display is similar for all three boards—not surprising, since they all use the //e's 80-column firmware. The RGB output of the three cards varies, though. The E' Card uses a different RGB scheme from that of the Apple RGB interface, which I see as the *de facto* standard for Apple II computers. Consequently, you sometimes get strange results when you run double-hi-res graphics software with the E' Card.

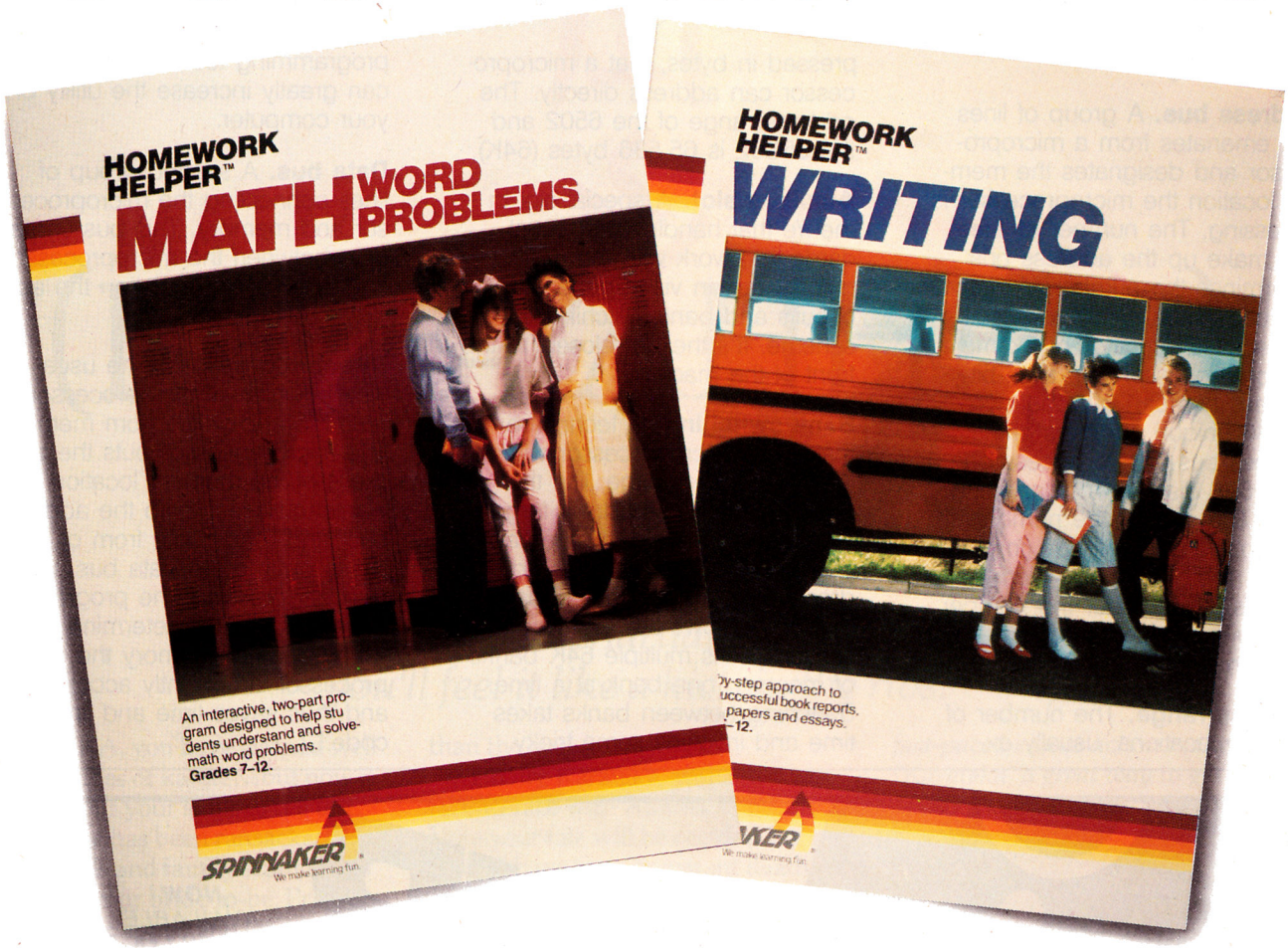
On the plus side, the E' Card offers 16-level grey video output. This feature greatly enhanced the quality of graphics on a monochrome monitor. Sixteen-level grey output is not available on RamWorks II or MultiRam.

AppleWorks Compatibility

The software that comes with these cards modifies AppleWorks to take advantage of the extra memory the cards provide. The size of the AppleWorks files you create depends on the amount of memory on your expansion card. All three cards alter AppleWorks so that it can handle large files. They also let you load most of the AppleWorks program into memory, thereby cutting down on disk-access time while you're running it. The only drawback to putting most of AppleWorks into memory is that the program then takes a couple of minutes to boot. RamWorks II and MultiRam offer this AppleWorks acceleration as an easily accessible option. This feature is standard with the E' Card.

Beyond file expansion and program acceleration, there are huge differences among the AppleWorks-modifying programs sold with the cards. Without doubt,

BLOCK BUSTERS.



Ever run into a mental block while doing your homework? Like how to start an essay? Or solve a tough math problem?

Well now there's help. The HOMEWORK HELPERS™ from Spinnaker. They're designed to bust these blocks and help you produce your homework assignments.

Through a unique system of prompts, the HOMEWORK HELPERS ask stimulating questions, inspire new ideas, and help you organize. And they cover two of the toughest homework challenges: writing well and solving math word problems.

Take WRITING. It has a unique, 3-part program for developing essays and book reports. It gets you started by asking key questions and shows how to organize an outline. Then its built-in word processor actually helps you write, edit, and print out the final work.

Then there's MATH WORD PROBLEMS. Its special grid system helps translate word problems into workable equations. It has a built-in calculator which shows the solution step-by-step and prints out homework calculations ready to hand in.

The Spinnaker HOMEWORK HELPERS are the mental block busters that produce homework results. Look for them at your local software retailer.

SPINNAKER®
We make learning fun.

Spinnaker is a registered trademark of Spinnaker Software Corp. Homework Helper is a trademark of Spinnaker Software Corp.
©1985 Spinnaker Software Corp., One Kendall Square, Cambridge, MA 02139.

Glossary

Address bus. A group of lines that emanates from a microprocessor and designates the memory location the microprocessor is accessing. The number of lines that make up the address bus determines the number of memory locations a microprocessor can access directly. For example, a microprocessor with a 16-bit address bus can put one of 65,536 unique numbers on its address bus (2^{16}) to access one of 65,536 discrete memory locations. The greater the number of lines in the address bus (in other words, the greater the width of the bus), the greater the number of individual memory locations the bus can define and access.

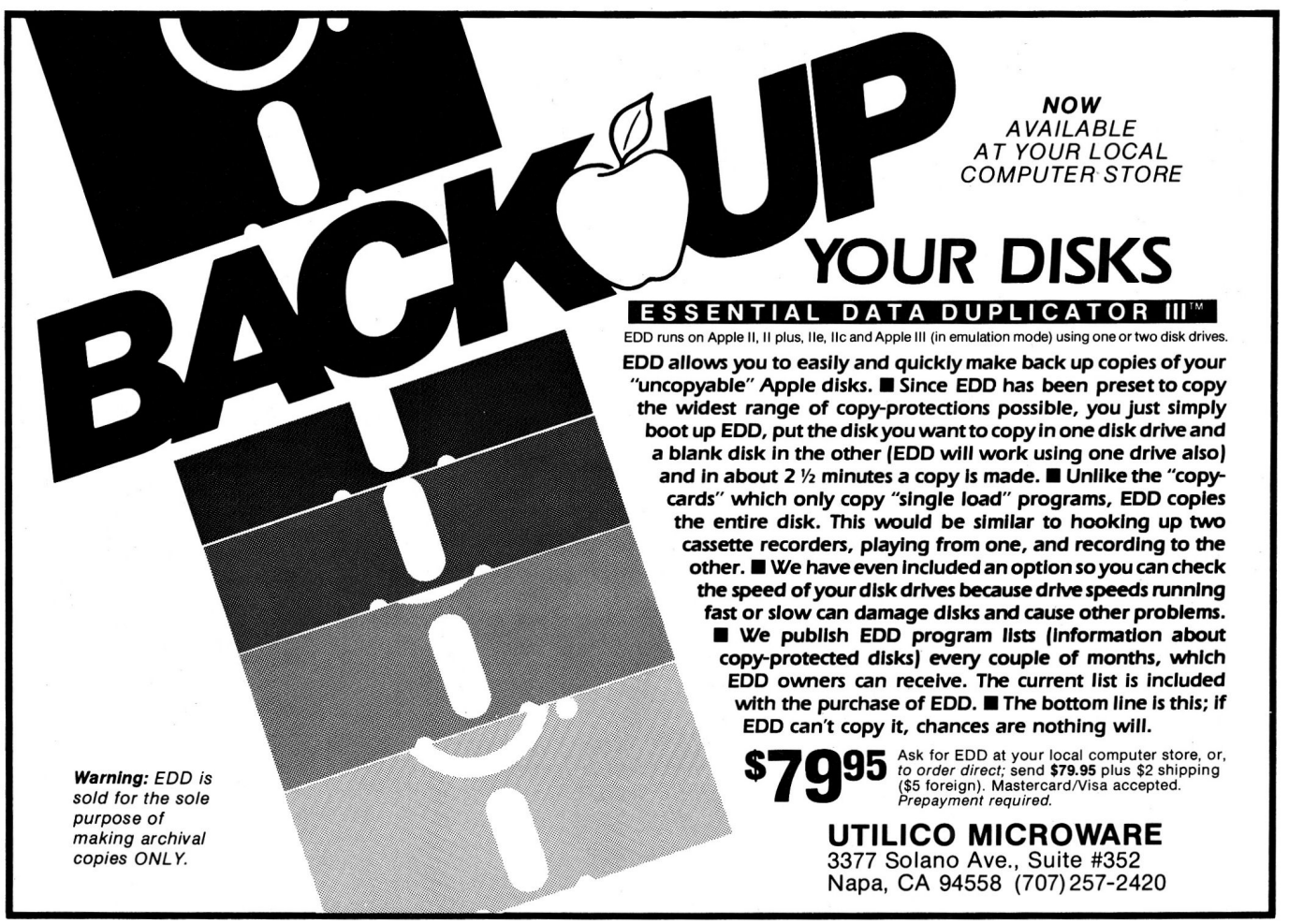
Address range. The number of memory locations, usually expressed in bytes, that a microprocessor can address directly. The address range of the 6502 and the 65C02 is 65,536 bytes (64K).

Auxiliary slot. A special slot in the //e that handles peripheral cards that work with the machine's built-in video-generation circuits and bank-switching scheme. It's the slot closest to the front of the machine.

Bank switching. A technique that lets a microprocessor with a limited address range, like the 6502 (or 65C02), address large amounts of memory. In the case of the 6502, which has an address range of 64K bytes, bank switching allows the microprocessor to access multiple 64K banks of memory, one bank at a time. Switching between banks takes time and involves some tricky programming techniques, but it can greatly increase the utility of your computer.

Data bus. A second group of lines connecting the microprocessor and memory. This bus carries data between the microprocessor and the memory location the address bus defines.

Direct addressing. The usual way in which a microprocessor reads to and writes from memory. The microprocessor puts the address of the memory location it wants to access onto the address bus, and reads data from or writes data to the data bus. With direct addressing, the program does not have to determine which bank of memory the microprocessor is currently accessing, and thus saves time and lines of code.□ **—R.R.**



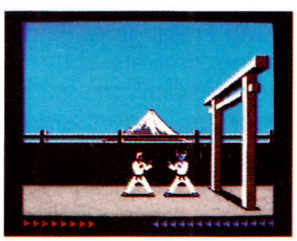
The Japanese have a word for it...

(EEEE-YAHHH!!!)

You are the star of a Martial Arts movie so real, you'll feel it like a kick in the ribs.

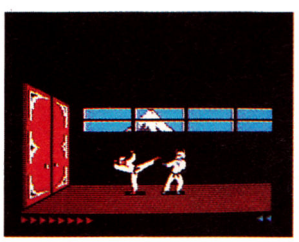
KARATEKA, you have learned well the disciplines of karate...but now it is time to put your skills to the test. Your village has been ransacked, your friends and family scattered to the winds, your bride-to-be, Princess Mariko, kidnapped and cruelly imprisoned by the evil warlord Akuma. If you ever hope to see her again, Karateka, you know what you must do.

Scale the mighty cliffs that lead to Akuma's fortress. There, you will encounter the first of many palace guards. Kick! Thrust! Parry! At every turn you will face yet another warrior, each stronger than the last.



Finally, Karateka, you will come face-to-face with Akuma himself. Here your fate will be decided. Either eternal happiness or instant death.

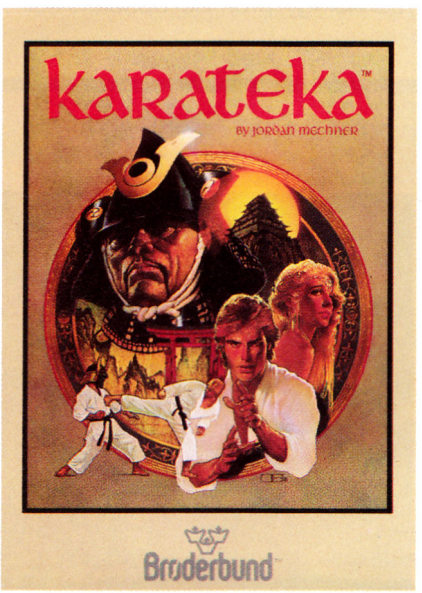
THE MAKING OF KARATEKA.



"Karateka" designer Jordan Mechner is a karate enthusiast and a stickler for realism. He used film clips of karate masters as a guide for the moves used in the game.

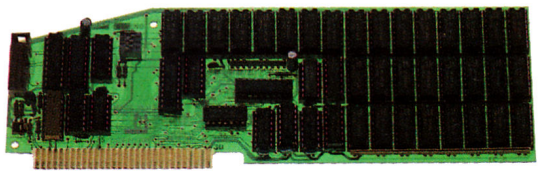
The carefully detailed, animated figures perform all the moves of real martial arts combat with stunning realism.

Beautiful scrolling, hi-res backgrounds, an intricate story line and fast-paced karate action make "Karateka" a great way to get your kicks.



Brøderbund®

KARATEKA is available for Apple, Commodore 64 and Atari personal computers. Look for it at your favorite Brøderbund Software dealer. For more information about Brøderbund products, please write us at 17 Paul Drive, San Rafael, California 94903-2101. Apple, Commodore and Atari are registered trademarks of Apple Computer, Inc., Commodore Electronics, Ltd. and Atari Corporation respectively. © 1985 Brøderbund Software, Inc.



Legend's E' Card

Table 2. Comparison chart for three auxiliary-slot RAM cards.

	Features						Evaluation				
Product	Max. Memory	RGB Output	16-Level Grey Output	16-Bit CPU Connector	AppleWorks Expansion	RAM-Disk Software	Ease of Installation and Use	Documentation and Support	Performance (see Table 1)	AppleWorks Compatibility	Rating
E' Card	1M	std	std	NA	std	std	good	poor	good	fair	★★
MultiRam //e	768K*	NA*	NA*	std**	std	std	good	excellent	good	fair	★★★
RamWorks II	3M	$129	NA	std	std	$29	good	good	good	excellent	★★★★

* An additional 768K, along with RGB and 16-level video output, should be available for MultiRam by the time this review appears.
** A G5816 board is now available from Checkmate Technologies. See page 52.

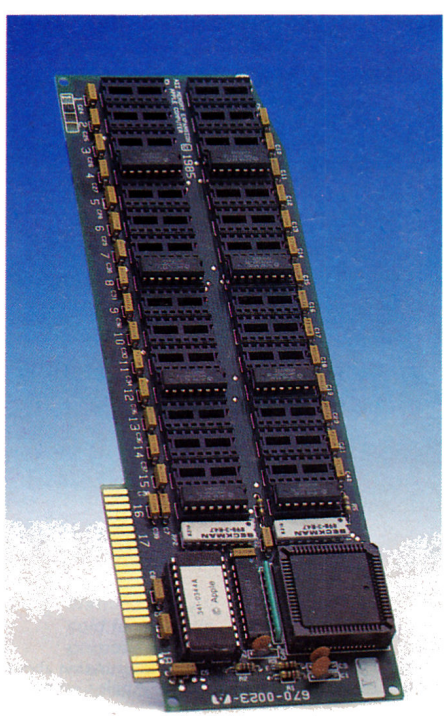
std = standard NA = not available

RamWorks II is the most powerful. Among other advantages, it increases the number of files on the desktop to 36, the number of data-base records to 5100, and the number of lines in the word processor to 5100. Most importantly, it automatically segments AppleWorks files that exceed the capacity of your disk drives. Neither the E' Card nor MultiRam currently expands these areas of AppleWorks, although both Legend Industries and Checkmate Technology promise updated software in the future.

AppleWorks is not the only package that can utilize the additional memory these expansion boards furnish. The list of supported software is small, but growing. Applied Engineering sells a pre-boot program for $29 that lets VisiCalc use RamWorks II's extra memory. Checkmate Technology lists VisiCorp's FlashCalc and Artsci's MagiCalc and Magic Office System as three programs that can employ some of the MultiRam memory without modification. The bank-switching method Apple's II RAM Expansion Card uses is not compatible with the technique employed by auxiliary-slot boards (see the accompanying sidebar, along with "Apple Announces New Products That Dazzle, New Enhancements That Perform" in the November 1985 issue, p. 12), and this may limit the number of software titles that take advantage of the extended-memory cards reviewed here.

In addition to AppleWorks expansion, Legend Industries and

New Card on the Block

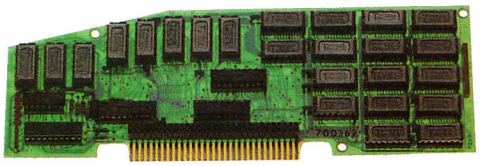


The technology that drives Apple Computer's recently introduced peripheral-slot Apple II RAM Expansion Card represents a radical departure from the operation of the auxiliary-slot memory boards featured in the accompanying review. The II RAM contains all the hardware and firmware your computer needs to implement bank switching. Consequently, it works in the Apple II and II Plus, in addition to the //e.

Software that takes advantage of the extra memory a II RAM board provides does not necessarily recognize the memory an auxiliary-slot card supplies. This does not mean, however, that the auxiliary-slot cards are obsolete. What it does mean is that you will have to make some hard decisions before purchasing any memory-expansion board for your Apple.

If you are primarily interested in extending AppleWorks, don't worry too much about the Apple II RAM Expansion Card. The auxiliary-slot cards will give you all the capability you need. In fact, Greg Hastings of Pinpoint Publishers, makers of the new Pinpoint AppleWorks accessories package, told *inCider* that he is working with the auxiliary-slot-board manufacturers to ensure that the initial release of Pinpoint will work with their boards.

Down the road, the II RAM Expansion Card will have more support from third-party software vendors than the auxiliary-slot cards. If your major application is not AppleWorks, you should wait until the II RAM Expansion Card becomes available (probably early '86) before you decide which card is best for you. *inCider* will review the II RAM Expansion Card as soon as production models are available.□ **—R.R.**



Checkmate Technology provide software that converts their cards to RAM disks. Applied Engineering charges you extra for comparable software. I checked out the three RAM-disk software packages and was satisfied with the performance of each. I didn't test the RAM-disk software extensively because I frankly don't find RAM disks particularly useful.

Conclusion

In conjunction with its AppleWorks-expansion software, RamWorks II is the most powerful auxiliary-slot memory card available for your //e, and I rate it four stars. MultiRam and the E' Card are both fine products, but neither is currently as useful or as capable as RamWorks II. MultiRam gets three stars, and the E' Card, primarily because of its poor documentation, two. For my money, Applied Engineering's RamWorks II is king of the hill.■

Product Information

E' Card
Legend Industries
Industrial Computer Division
2220 Scott Lake Road
Pontiac, MI 48054
(313) 674-0953

Reader Service Number 305

MultiRam //e
Checkmate Technology
509 South Rockford Drive
Tempe, AZ 85281
(602) 966-5802

Reader Service Number 306

RamWorks II
Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 241-6060

Reader Service Number 307

Note: See **Table 1** for prices.

Table 3. Speed check on a 5994-cell spreadsheet composed of the formula N = N + 1.

Memory Board	Recalculation Time (average of three recalculations)
E' Card	83.95 seconds
MultiRam //e	84.62 seconds
RamWorks II	84.51 seconds

Note: Since timings were done by hand, the difference between MultiRam and RamWorks II is not significant. The E' Card shows a 0.6 percent performance advantage over both MultiRam and RamWorks II.

FIND OUT ABOUT IT!

Financial Software from Core Concepts™

WORK FORCE II™ 6 programs on 1 disk.

1. **THE LOAN ANALYZER:** Compute loan and mortgage amortizations, balloon payments, total interest paid, daily percentage rates, present value of capital leases, and periodic payment amounts. Find an unknown term or the amount which can be financed. Print or display amortizations starting or stopping at any period. Currently used by Banks, CPA's and realestate agents across the country.
2. **THE SAVINGS ANALYZER:** Compute the future value of savings, IRA's, and investments in moments with The Savings Analyzer.
3. **THE BALANCING ACT™ :** Checkbook balancing is made easy with this once a month checkbook balancing program. Menus allow entries to be added or changed. Group totals, amount of error, and all entries can be printed or displayed.
4. **THE LINE WRITER™ :** A line-at-a-time correctable typewriter. Great for addressing envelopes and other small word processing jobs.
5. **THE WAGE ANALYZER:** Analyze your income by the hour, time & ½, weekly, bi-weekly, semi-monthly and annually. Calculate increases or decreases by amount or percent. Printout provides a great way to present pay raises to employees.
6. **THE CALCULATOR:** Turns your Apple into a four function printing calculator.

"What exactly do you get for this price in these days of $100 minimum work programs? You get a real value. I found the programs a joy of ease, completely understandable and with a price that's hard to resist. A valuable indispensible tool..." **The San Francisco Independent / Business Section / July 4th, 1984.**

PROFIT PURSUIT™ 4 programs on 1 disk.

1. **DEPRECIATION + :** Print or display Straight-Line, Declining Balance, Sum-of-the-Years-Digits depreciations. Plus 3, 5, and 10 year ACRS for personal property, 15 & 18 year ACRS for real estate.
2. **APR!:** Find the Actual Percentage Rate of loans with prepaid points and fees.
3. **LEASE MASTER™:** Find lease payment amounts, pre-tax monthly and yearly yield, total yield. Compute with multiple advance payments and residual value. Print or display lease amortizations starting or stopping at any period.
4. **PRICING MASTER™:** Find the cost, selling price, mark-up, and margin. Recalculate by changing any entry. Print item name and data. A must for retailers & wholesalers!

Compatible with the Apple IIc, IIe, II+ & II. IBM PC, XT, AT, jr

Call Toll Free
ORDERS ONLY
1-800-525-CORE

30 DAY MONEY-BACK GUARANTEE

ORDERS SHIPPED IMMEIDATELY!

Apple is a registered trademark of Apple Computer. IBM is a registered trademark of International Business Machine

☐ Rush me WORK FORCE II for the APPLE at $39.95
☐ Rush me PROFIT PURSUIT for the APPLE at $39.95
☐ Rush me WORK FORCE II for the IBM at $47.95 (prices include shipping)
Arizona residents add 6% Sales Tax. Oversea's add $5.00

Card # _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Signature _____ Valid From____ to____

Name_____ Phone_____

Address_____

City/State/Zip _____

MasterCard VISA

Core Concepts
P.O. Box 24157 Tempe, AZ 85282
AZ residents & inquiries call (602) 968-3756

AMERICAN EXPRESS Card

Circle 163 on Reader Service Card.

GRAY FLANNEL SORTS

Master the art of arrangement. Our demonstration program illustrates five sorting algorithms for your data-base applications.

by Peter C. Lincoln

To create a bit of order out of chaos, you'll occasionally find yourself rearranging one of your many lists—alphabetizing an inventory, sorting a mailing list by ZIP code, and so forth. Obviously, the longer the list, the longer the sorting process takes and the more useful your computer can become.

Since there's more than one way for a computer to sort data, I'll introduce you to the techniques of five sorting algorithms. Then you can type in the accompanying **Program Listing** (p. 33) to see these algorithms displayed on your computer screen in lo-res (low-resolution) graphics.

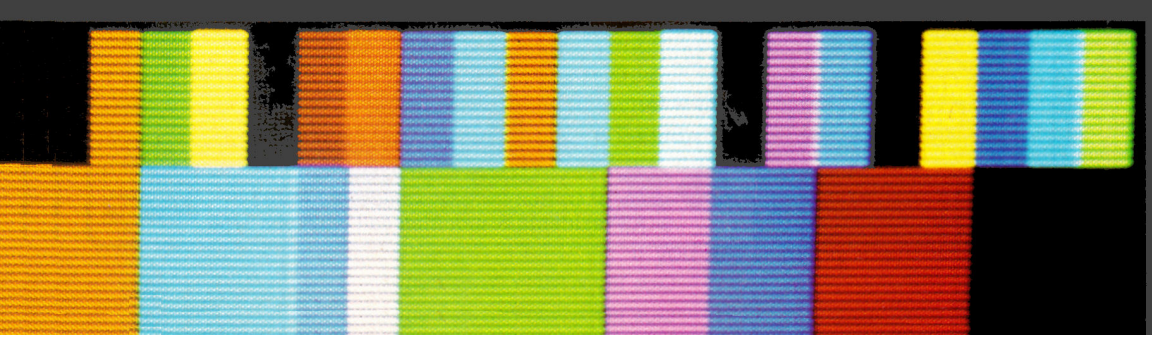
Quicksort

A simple but effective sorting algorithm, Quicksort was conceived by Professor C.A.R. Hoare even before he had a computer language advanced enough to use it. Quicksort's underlying strategy is to choose a pivotal value—typically the value of some item in the list—that divides the list into two shorter lists. Items are exchanged two at a time; those too large for the first part are exchanged with items too small for the second part until all items less than the pivotal value are in the first part, and all items greater in the second.

Then you choose a pivotal value for each of these two lists (and all subsequent sublists) and repeat the process. If you're lucky and pick as pivotal value the item that belongs exactly in the middle, the sort will speed along at maximum efficiency. While choosing a proper pivotal value and keeping track of all the sublists are complicated tasks, Quicksort, in general, lives up to its name. It performs best on scrambled lists, and, curiously enough, worst when an input list is already in order.

Shellsort

Quicksort didn't develop in a vacuum. Some years earlier, D.A. Shell had worked out a sorting technique that also uses remote testing and moving. He observed that comparing only adjacent items slows a sort down since the number of items to be sorted actually increases in the process. Shell's insight was to compare items some distance apart and exchange them whenever they were out of order. Both items jump several positions—usually much closer to their final destinations.



Illustrations are actual enlarged screen displays of unsorted (top) and sorted (bottom) color bars.

Let's compare Apples™ to Apples™.

An Apple IIc

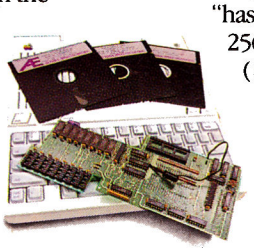
An Apple IIc with Z-RAM

The Apple IIc on the right works exactly the same as the Apple IIc on the left. Almost. The Apple on the right has a powerful memory expansion coprocessing card called Z-RAM. From Applied Engineering. Which means the Apple on the right can completely load AppleWorks into RAM—and then run it up to thirty times faster than the Apple on the left.

Z-RAM also acts as a solid-state disk drive. Which means the Apple on the right will load and store programs up to 30 times faster. And, our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

Turbo Charged AppleWorks.

Even a 256K Z-RAM can completely load AppleWorks into RAM. With Z-RAM, the moment your fingers touch the keyboard AppleWorks responds. A 256K Z-RAM lets your IIc run AppleWorks up to 30 times faster, increases available desktop to 235K and maximum number of records from 1,350 to over 16,000, doubles the number of lines allowed in the word processor, provides a print spooler, and auto-segments large files so they can be saved on two or more disks. A 512K Z-RAM boosts AppleWorks desktop to an incredible 425K.



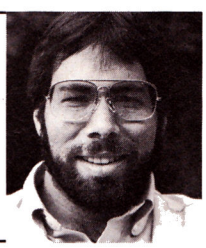
Take a closer look.

There's more. Z-RAM has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC. A 16 bit option is also available.

And still more. Z-RAM is compatible with all IIc software and hardware, installs easily in just ten minutes with a screwdriver (slightly longer without), is available with 256K or 512K of additional memory (a 256K Z-RAM can be upgraded to 512K at any time). Z-RAM is easily handled by the IIc power supply with our patent pending power saving design.

The only thing better than that would be a recommendation from Steve Wozniak.

> ***"I recommend Applied Engineering products whole-heartedly." (Of course, Steve's IIc has a Z-RAM installed.)***
>
> *Steve Wozniak, the creator of Apple Computer*



For fast response.

Z-RAM comes complete with simple instructions, RAM disk software, Z-80 operating system, CP/M manual. And a five year "hassle free" warranty. Make a good Apple great. With 256K Z-RAM "384K total" ($359); with 512K "640K total" ($419); 16 bit option may be added later ($89).

If you want to run CP/M software, but don't need more memory, we suggest our Z-80c card. The Z-80c has no memory expansion ports and is priced at only $159.

Call 214-241-6060 TO ORDER TODAY. 9 a.m. to 11 p.m. Seven days, or send check or money order to Applied Engineering. MasterCard, Visa and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

Applied Engineering
P.O. Box 798, Carrollton, TX 75006
(214) 241-6060

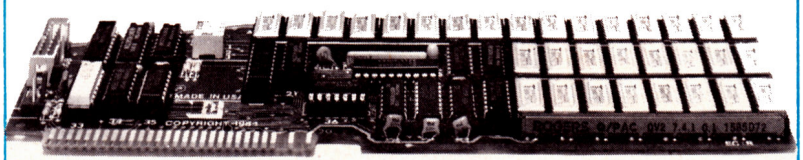
80 COLUMN DISPLAY
compatible with software written for Apple extended 80 column card

RGB VIDEO CAPABILITY
for display of all Apple colors

NEAR PHOTOGRAPHIC QUALITY
when using most color software on monochrome monitors.
achieved by 16 tone graduations of the monochrome image

UP TO A FULL MEGABYTE
expandable memory upgraded with 64K or 256K RAM chips

APPLEWORKS EXPANDSION PROGRAM
dramatically increases desktop memory. . .up to 735K



All These Features For Your Apple //e, All On One

LEGEND E' CARD™

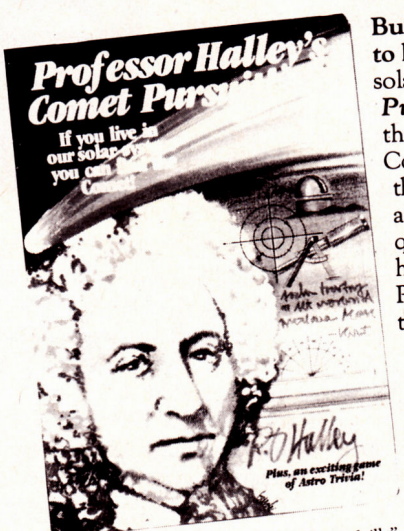
Three Year Warranty!

LEGEND INDUSTRIES, LTD.
2220 Scott Lake Road, Pontiac, MI 48054 • (313) 674-0953
Turning Apples into Legends™ since 1981

Legend and E' Card are trademarks of Legend Industries, Ltd. Apple and AppleWorks are trademarks of Apple Computer, Inc.

Circle 28 on Reader Service Card.

If you live in our Solar System, you CAN find the Comet!



"Animation created with TAKE 1 by Baudville"

But, to find Halley's Comet you've got to know where to look. If you are of this solar system, ***Professor Halley's Comet Pursuit*** will help you pinpoint and trace the actual course of the legendary Comet! Also contained in this package is the *Comet Challenge*, an educational astro trivia game with over 500 questions on Edmund Halley, Comet history, and space technology. Get Professor Halley's Comet Pursuit and trace a heavenly body.

Compatible with Apple II™ series.

Olympus
Educational Software, Inc.

1660 Hotel Circle No./Ste. 310/San Diego, CA 92108/(619) 296-8555

AVAILABLE AT:

1-800-THE MENU

Circle 136 on Reader Service Card.

The Shellsort technique compares the first item in the list with an item a certain distance away—the distance determined by an offset value you choose—and, whenever it's necessary, exchanges the items. What saves time is that in the early passes fewer comparisons are made. Some needed exchanges are overlooked at that time, of course, but the exchanges that do occur move the items closer to where they belong.

With each pass through the list, the offset is decremented. This process is repeated until the offset is one; only then will adjacent items be compared and exchanged. The advantage of Shell's method is that the list is nearly sorted before you compare adjacent items.

Shellsort calculates the offset on the basis of the number of items in the list and not the value of any item (as with Quicksort), thus reducing the overhead of keeping track of all sublists. You may be concerned with how best to choose the pivotal value. But remember also that if you spend too much time trying to find a good value, you'll slow the sort down.

Insertion Sort

An insertion sort creates a new, sorted list from an old, unsorted list. It takes one item at a time from the unsorted list and inserts it into its proper position in the sorted list—until all items are sorted. Thus, there can be no final output until all input is complete.

Finding the position for insertion can be complicated; I chose the simplest technique to program. As each unsorted item is tested, the higher items in the sorted list are moved over to make room. This wastes little time on sorted input; each presorted item comes in where it belongs, and so is inserted with a minimum of comparisons.

An insertion sort works well on relatively short lists. For a dozen items, this simple technique could be your first choice. With hundreds

(No I.D. required for half-elves.)

When the Going Gets Tough, the Bard Goes Drinking.

And the going is tough in Skara Brae town. The evil wizard Mangar has cast an eternal winter spell. Monsters control the streets and dungeons beneath. Good citizens fear for their lives. What's worse, there's only one tavern left that serves wine.

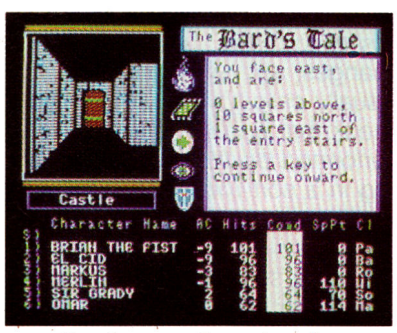
But the Bard knows no fear. With his trusty harp and a few rowdy minstrel songs he claims

are magic, the Bard is ready to boogie. All he needs is a band of loyal followers: a light-fingered rogue to find secret doors, a couple of fighters to bash heads, a conjurer to create weird allies, a magician for magic armor.

Then it's off to combat, as soon as the Bard finishes one more verse. Now what's a word that rhymes with "dead ogre?"

4 classes of magic user, including wizard and sorceror. 85 new magic spells in all.

128 color monsters, many animated. All challenging.



Full-color scrolling dungeons. 16 levels, each better than the one before. 3-D city, too.

Optional use of characters created in Wizardry® or Ultima III.®

The Bard's Tale™

from

ELECTRONIC ARTS™

Specs: 100% machine language, 400K worth on 2 disks. 64K RAM minimum; enhanced for 128K. Now available for Apple II family for $44.95, C-64 & 128 for $39.95. **To order:** Visit your retailer or call (800) 227-6703 (In Calif. call (800) 632-7979) for VISA or MasterCard orders. To purchase by mail, send check or money order to Electronic Arts, P.O. Box 306, Half Moon Bay, CA 94109. Add $3 for insured shipping and handling. Allow 1-4 weeks for delivery. The Bard's Tale is worth the wait.

Apple is a trademark of Apple Computer. Wizardry is a registered trademark of Sir-Tech Software, Inc. Ultima is a registered trademark of Richard Garriott. The Bard's Tale and Electronic Arts are trademarks of Electronic Arts. For a copy of our complete catalogue and direct order form, send $.50 and a stamped, self-addressed envelope to Electronic Arts, 2755 Campus Drive, San Mateo CA 94403.

Circle 148 on Reader Service Card.

of items to sort, though, an insertion sort can be slow because it must compare numerous adjacent items to find the proper position for each item. Even then, its simplicity can make it attractive.

Selection Sort

A selection sort also creates a new list from an old one. It scans the entire list to find the first item for the new list, then scans the rest of the list to find the next item, and so on until all items are sorted.

A selection sort differs from an insertion sort in that all of the input is scanned before anything is output; once an item is ready for output, it's not needed again. These differences are muted in the demo program because all input is completed before any of the sorts start.

Exchange Sort

In its simplest form, an exchange sort is a brute-force technique that compares adjacent items and exchanges those out of order. That may sound like a speedy method—just once through and it's done—until you realize that there's no guarantee that the job is complete. Subsequent passes are necessary to make additional exchanges, and some indicator (usually called a flag) is needed to check that no exchanges were performed on the final pass. This flag in a sort routine is a giveaway that the sort algorithm is the notorious bubble sort.

Bubble sort is so slow because every time through it checks each item with the one following—it's comparing not only adjacent items but all items. Additionally, the number of comparisons is reduced by only one for each pass. Yet, in spite of its known deficiencies, people continue to use this sort. One excuse is that it works fairly well on sorted input. Think about that for a minute: If you don't need a sort, a bubble sort will work.

If you ever want to revise a program that has a bubble sort in it, remember Shell. A few simple changes and additions to the code should produce a dramatic increase in efficiency.

A Graphic Demonstration

To observe the sorts in action, run my demo program. Each sort rearranges a pattern of stripes (in various colors if you have a color monitor) in numerical order according to the logic of Apple lo-res graphics. "Darker" colors move leftward, "lighter" colors, rightward. For purposes of comparison, the initial pattern remains at the bottom of the display. Each sorting algorithm beeps when it starts and again when it finishes, so you can time it.

You can select one pattern and observe how each algorithm sorts it, or one algorithm and observe how it sorts several different patterns. The pattern is arbitrary up to a point—actually, up to a line. In each pattern, the rightmost stripe will always be color 15 (white). This upper bound makes the algorithms more efficient. An important part of the instructions is to know when to stop. If the rightmost item is the biggest item, then testing for the right end of the list is simplified. Bear this in mind if you want to use these subroutines in a different program.

Programming Notes

The procedure I used to choose the Shellsort offset comes from Knuth (see "Further Reading") and encodes the sequence 1, 4, 13, 40, 121, 364, 1093. . . $(3^k - 1)/2$. This sequence of offsets should prove useful if you want to adapt the subroutine to other tasks.

The Shellsort can also be adapted to other sorts. For example, Knuth adopts Shell's method to increase the speed of the insertion sort, and I've followed Dwyer and Critchfield in applying Shell's method to the exchange sort. Additionally, I've improved slightly on the simplest form of the bubble sort. Following Knuth, I made the value of BOUND depend on the value of FLAG such that items occurring later in the list than the last exchange are ignored on subsequent passes. Even so, I think you'll soon find this algorithm unsatisfactory.■

Further Reading

In programming the algorithms, I've largely followed the techniques presented in *BASIC and the Personal Computer* by T.A. Dwyer and M. Critchfield (Addison-Wesley, 1978). Their explanations of sorting (and other topics) are an excellent starting place for further study.

The best reference book on sorting is *The Art of Computer Programming Vol. 3: Sorting and Searching* by D.E. Knuth (Addison-Wesley, 1973). Don't let the highly mathematical portions keep you from discovering Knuth's rich style and his command of technical facts.

Algorithms + Data Structures = Programs by N. Wirth (Prentice-Hall, 1976) contains an excellent discussion of sorting techniques aimed at Pascal programmers. If you don't use Pascal, don't let that bother you. Wirth himself, though an author of Pascal, has moved on to another of his languages.

In "The Emperor's Old Clothes" (originally in *Communications of the Association for Computing Machinery,* February 1981; reprinted in *Byte*, September 1981, pp. 414–425), Professor C.A.R. Hoare talks eloquently about sorts, computer languages, and other matters and tells of some personal experiences that led up to the 1980 ACM Turing Award.

In *Sorting and Sort Systems* by Harold Lorin (Addison-Wesley, 1975), the approach is deliberately less technical than Knuth's. On the other hand, it does include reprints of the original ALGOL statement of many famous sort techniques.□

—P.C.L.

Address correspondence to Peter Lincoln at 3905 Niele Place, Honolulu, HI 96816.

Inside Apple Vol. 2, No. 1

Here's the inside story on all the colorful things that have happened at Apple.

Go ahead, accuse us of sensationalism.

Over the next four pages, we're going to bare our specs and divulge all the nitty gritty details about the latest developments to come out of Apple Computer.

Starting with our new Apple® ColorMonitor IIe and ColorMonitor IIc.

In all modesty, we think these are the best color monitors you can buy at any price for your Apple II, II+, IIe or IIc personal computer.

Both have composite color, 13-inch screens that let you produce a dazzling array of multi-hued graphics. Without going to the expense of adding an RGB interface card or external adaptor.

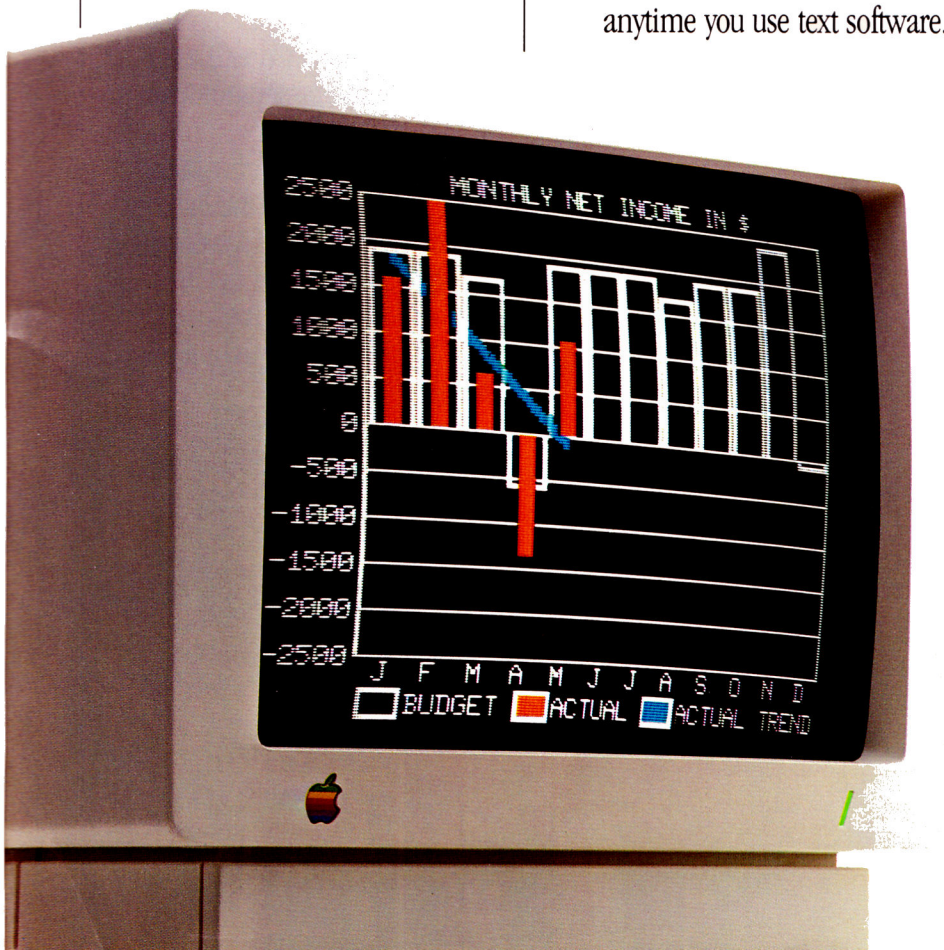
Simply plug the monitor directly into the video output jack on the back of your Apple, and you're ready to start computing in living color.

Which is terrific for games and graphics oriented programs like Apple Logo II, Instant Pascal™ and Dazzle Draw.

But not quite so terrific for text programs. As anyone who's ever gone blurry-eyed from trying to read words on a color CRT will readily attest.

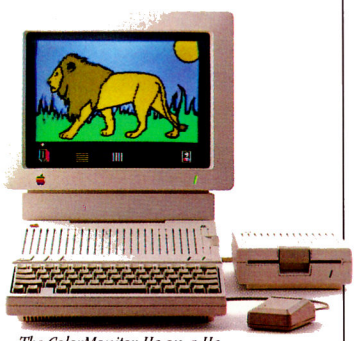
Not to worry.

We've designed both ColorMonitors to automatically go from color to a high resolution, 80-column monochromatic mode anytime you use text software.



As you can see, we've also styled each ColorMonitor to fit in with our family looks. The ColorMonitor IIc is pure white, and has an optional rigid stand. While the ColorMonitor IIe is designed to rest on top of your Apple IIe, and comes in our favorite shade of beige.

The ColorMonitor IIe on a IIe.



The ColorMonitor IIc on a IIc.

And thanks to some particularly bright Apple engineers, our ColorMonitors are compatible with virtually all existing Apple II software.

Well, there you have it. The scoop on one of the most colorful events in Apple history. But as you might expect, it's certainly not the whole story.

If you turn the page, you'll see that the saga continues.

The truth about our new color printer in black and white.

In case you haven't heard, Apple has a whole new cast of characters.

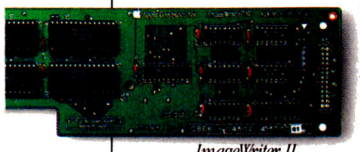
Our ImageWriter™ II printer.

Like its predecessor, the original Apple ImageWriter, our ImageWriter II is one of the most dependable dot matrix printers very little money can buy. And it's compatible with every Apple personal computer.

But that's where the similarities end.

The ImageWriter II prints faster and clearer than the original ImageWriter.

It cruises through drafts at a blazing 250 characters per second. Produces sharp graphics. Creates near letter-quality text. And lets you print in six vivid colors.



ImageWriter II 32K Memory Option.

Simply change the black ribbon to the continuous cloth, multi-color ribbon, and you're ready to churn out reams of yellow, red, blue, orange, green and purple output.

You can print pictures and greeting cards with software like Stickybear Printer. Design your own color drawings with Blazing Paddles and Dazzle Draw. And whip out color business graphics using SuperCalc 3A, pfs: GRAPH or Mouse Calc.

As you would expect, you can vary the pitch and spacing on the ImageWriter II. And print in standard or half height.

But as you would probably never expect, the ImageWriter II is also expandable.

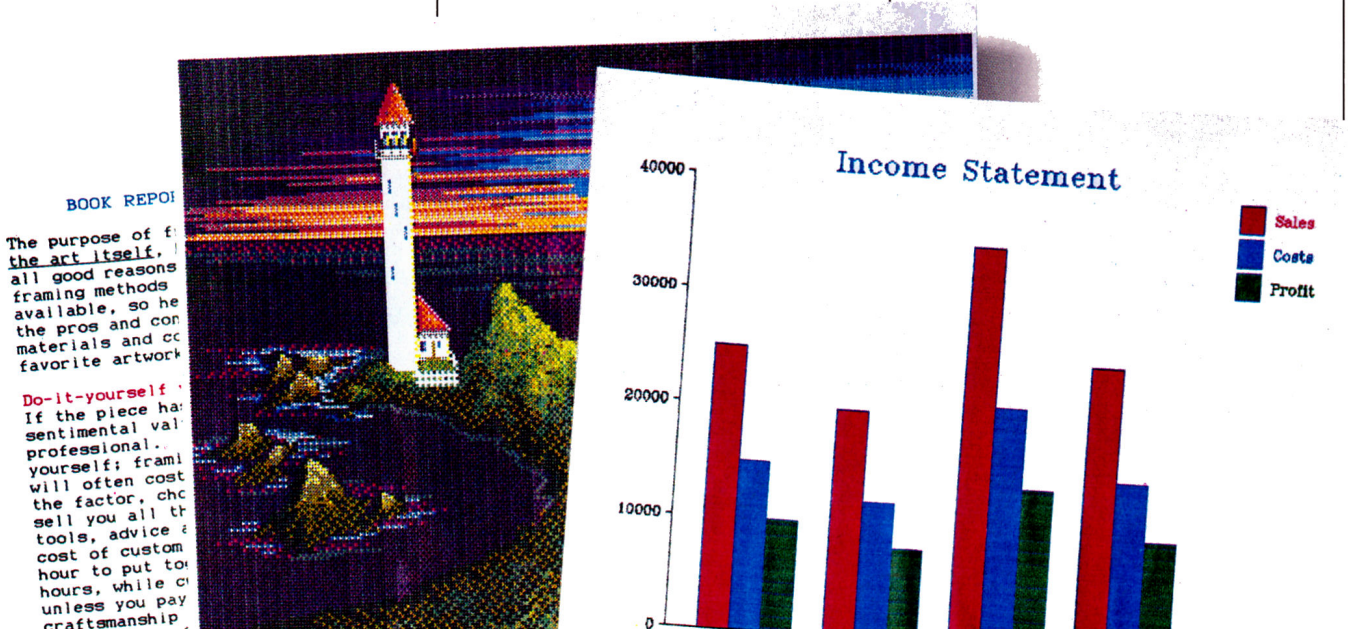
By adding the ImageWriter II 32K Memory Option print buffer, you can continue to compute while the printer continues to print.

Attach the ImageWriter II SheetFeeder, and you can automatically load single sheets of paper into the printer.

And by having your authorized Apple dealer install our AppleTalk™ Option, the ImageWriter II can even be shared by several different Macintosh™ workstations.

Which means, for businesses, it can vastly improve the looks of one very important piece of paper:

Your budget sheet.

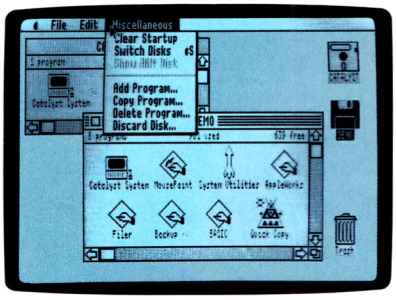


Stop flipping between floppies.

We call it the "floppy disk shuffle."

Having to boot and re-boot floppy disks every time you want to go from one application to another.

Well, the end of your shuffling is in sight.



Catalyst 3.0 with desktop icons.

Quark, Inc., will soon be shipping a unique new program called Catalyst™ 3.0 that's designed to be used with Apple II computers equipped with mass storage.

Catalyst 3.0 lets you install multiple programs on a single storage device. Macintosh-type desktop icons show you what's loaded on the program. To select the item you want, simply use an optional mouse or keyboard to open the file.

Look for Catalyst 3.0 to show up on dealer shelves soon.

Then you'll finally be able to boot all those floppies for good.

A plug for our new modem.

With the introduction of our new Apple Personal Modem, we've solved one of the biggest problems known to modems:

Where to hide them.

The Apple Personal Modem plugs directly into a standard A/C wall outlet. So unless your computer room is decorated with paisley wallpaper, it'll blend right into the immediate surroundings.

Of course, aesthetics aside, it's also one darn good modem.

The Apple Personal Modem offers 300/1200 baud operation. Has the latest VLSI technology. Features automatic dial, re-dial and answer capabilities. Uses the industry standard Hayes AT Command Set. Plus it's totally compatible with current Apple communications software.

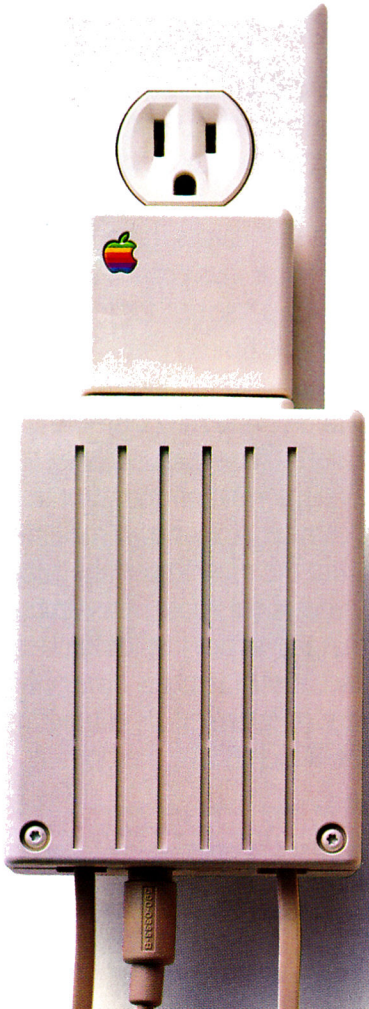
And even though we designed the Apple Personal Modem to be out of sight, there's one part of it that's definitely not:

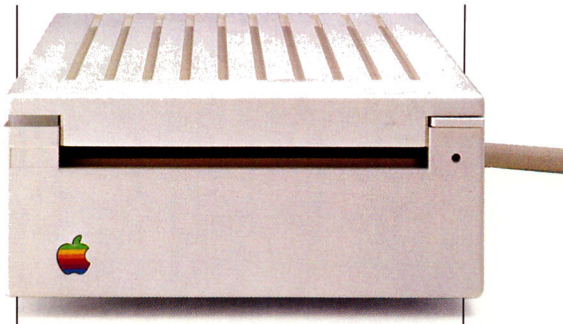
The price.

We've increased our drive.

Our capacity for work just got bigger.

The new Apple UniDisk™ 3.5 external drive uses 3½" dual-sided microdisks to add a humongous





800 kilobyte capacity to your Apple II, II+, IIe or IIc. Which is more than five times the amount of storage available from a standard 5¼" drive.

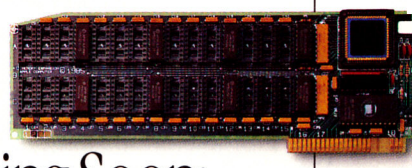
The UniDisk 3.5 is also faster than 5¼" drives. So you'll spend less time listening to that all-too-familiar whirring sound.

You can even "daisy chain" a second UniDisk 3.5 off the first one. In case you're planning to write the next great American epic or something.

As you may not know, disk drives are the most vulnerable components of any computer system. So it's nice to know that no other disk drive is closer to fail-safe than our UniDisk 3.5.

Because no other company has our dedication to quality. Our concern for reliability.

Or our drive.



Coming Soon: The biggest Apple IIe in memory.

The Apple II Memory Expansion Card should be on dealer shelves soon.

Before long, you'll be able to instantly and easily add another 256K, 512K, 768K or full megabyte of RAM to your Apple II, II+ or IIe. Making it one of the most powerful personal computers in its class. Or business. Or home.

Snow white and dwarf monthly payments.

Once upon a time, most people had to dwindle their checking accounts down to the right side of the decimal point in order to buy an Apple.

Or stretch their charge cards to the place where they didn't have a choice but to leave home without them.

Then, mercifully, our finance department invented the Apple Credit Card.

With an Apple Credit Card, you may qualify for up to $2,500 of instant credit to spend on the Apple computer or peripherals of your choice.

And, from now until December 31st, 1985, we'll generously waive the 10% down payment.

Which means the only thing you'll have to come up with are the small monthly payments.

Getting your Apple Credit Card is almost as easy as breathing. All you need is another major credit card. And a valid I.D.*

Which means, that very same day, you'll be able to take your new Apple home.

Where you'll both live happily ever after.

Group therapy for Apple users.

Have you ever felt like you needed help—serious help—with your Apple, but didn't know where to turn?

Then we suggest you join an Apple Users Group.

From Kennebunkport to Kaanapali, Apple Users Groups are springing up by the dozen.

They meet to discuss ProDOS,™ Pascal and WPL. Exchange public domain software. Demonstrate new products. Listen to guest speakers.

And provide the kind of moral support that comes in handy after "Range error" has popped up on your DOS 3.3 screen for the 42nd consecutive time.

Many groups publish regular newsletters and magazines. And operate bulletin boards that let you get the information you want from the comfort of your own modem.

But the most important thing to know about Apple Users Groups, is that they're not just for hackers. In fact, most members have only novice or intermediate computing skills. Which is why they join in the first place.

To get in touch with the Apple Users Group in your area, check with your local authorized Apple dealer.

With over 400 Apple Users Groups already in existence throughout the U.S. and Canada, chances are the help you need is right around the corner.

Your computer should join a health club.

Computers—even Apples—can sometimes be temperamental little devils.

And if something goes wrong with yours after the 90-day limited warranty expires, you're the one who'll be out of shape.

Unless you get Apple*Care*.℠

Apple*Care* is our extended service contract that covers the cost of parts and labor for up to three years. And the annual fee is usually about half the cost of a single repair.

Introducing the health care plan for your Apple.

You can buy Apple*Care* from your participating authorized Apple dealer. And the contract will be honored at more than 2,400 Apple dealers across the country.

So even if you decide to move to some out-of-the-way place like Keokuk, your Apple*Care* coverage will go along with you.

Although we can't guarantee your family will.

By major, we mean MasterCard, VISA, American Express, Diner's Club and Carte Blanche. Certain restrictions may apply. *© 1985 Apple Computer, Inc. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. ProDOS, DuoDisk, UniDisk, ImageWriter and AppleTalk are trademarks of Apple Computer, Inc. AppleCare is a service mark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is being used with its express permission. Catalyst is a trademark of Quark Incorporated. Instant Pascal is a trademark of Think Technologies. Dazzle Draw is a trademark of Broderbund, Inc. Stickybear is a trademark of Optimum Resource, Inc. Blazing Paddles is a registered trademark of Baudville, Inc. SuperCalc is a trademark of Sorcim Corporation. PFS is a registered trademark of Software Publishing Corporation. Mouse Calc is a trademark of Version Soft. Hayes is a registered trademark of Hayes Microcomputer Products, Inc.* *For an authorized Apple dealer near you, call* ***(800) 538-9696.*** *In Canada, call* ***(800) 268-7796*** *or* ***(800) 268-7637.***

Program listing. *Screen-sort demo program.*

```
100  REM SCREEN SORT DEMO PROGRAM
105  REM BY P.C. LINCOLN
110  REM     AUGUST 1983
115 :
116 : REM  INITIALIZE
117 :
120 N = 40: REM  COLUMNS TO SORT
121 :
130  DIM A(N): REM  HOLD PATTERN
131 :
140  DIM L(N / 2),R(N / 2): REM     FOR QUICKSORT POINTERS
141 :
150 Y = 0: REM POINT TO TOP OF STRIPE
179 :
180  GOTO 300
197 :
198 : REM PAINT SCREEN
199 :
200  HOME
210  FOR X = 0 TO 38
220  COLOR = A(X + 1)
230  VLIN 0,14 AT X
240  NEXT
241 :
245  REM     RIGHTMOST IS MAXIMUM FOR SENTINEL
248 :
250  COLOR = 15
260  VLIN 0,14 AT 39
270  RETURN
299 :
300  GOSUB 9000: REM INSTRUCTIONS
301 :
310  GOSUB 500: REM NEW PATTERN
311 :
320  GOSUB 200: REM PAINT IT
321 :
400  VTAB 22: PRINT "1 QUICK, 2 SHELL, 3 INSERTION"
410  VTAB 23: PRINT "4 SELECTION, 5 EXCHANGE,
     6 NEW, 0 EXIT"
415  GET Z$: IF Z$ < "0" OR Z$ > "6" THEN 400
416 ZZ = VAL (Z$)
420  IF ZZ = 0 THEN TEXT : HOME : END
430  IF ZZ = 6 THEN GOSUB 500
440  GOSUB 200
444  REM REPLACE LINES 450 AND 470 WITH CALL
     TIME ROUTINES IF YOU CAN
450  PRINT CHR$ (7): REM BEEP BEGIN
460  ON ZZ GOSUB 1000,5000,2000,4000,3000
470  PRINT CHR$ (7): REM BEEP FINISH SORT
480  GOTO 400
497 :
498 : REM CREATE PATTERN IN A()
499 :
500  FOR X = 0 TO N
510 A(X) = INT ( RND (1) * 16)
520  NEXT
530  HOME : GR : REM CLEAN SCREEN
540  RETURN
550 :
900  END
```

Listing continued.

COMPUTER NETWORK

800-621-0937

ORDER TODAY! BEAT THE CHRISTMAS RUSH!

NEED MORE MEMORY

Multiram //e	64k	$ 128.95
Multiram //e	256k	175.95
Multiram //e	512k	230.95
Multiram //e	768k	299.95
Multiram //c	256k	259.95
Multiram //c	512k	310.95
Ramworks	64k	139.95
Ramworks	256k	187.95
Ramworks	512k	235.95
Z-RAM //c	256k	348.95
Z-RAM //c	512k	375.95
Veiwmaster		105.00
Z-80 Plus		105.00
Timemaster II H.O.		100.95

New! **65C816 8/16-BIT CHIP***

16-Bit Co-Processor kit for:
IIe....$180.00 IIc....$140.00

APPLEWORKS SECTION

Graphworks	55.95	Pinpoint	$CALL
Jeeves (DeskWorks)	34.95	Sideways	35.20
HabaMerge	48.50	Sensible Speller	73.30
Haba Templates	19.95	Haba Speller	39.95
Megaworks	73.40	KeyBoard Template	15.95
PreBoot II+ (Videx)	CALL	Speedemon	196.50

BUSINESS

Back to Basics Acct.	CALL
Bank Street Maliler	40.99
Bank Street Writer	40.99
Bank Street Speller	40.99
Bank Street Filer	40.99
BPI G/A, A/R, A/P	$LOW
Finance & Amort.	29.95
PFS File & Report ea.	71.50
PFS Write	71.50
PFS Best Seller	149.00
Sensible Speller	72.00
Supercalc IIIa	99.95

EDUCATION

Algebra 1/2/3/4 ea.	23.45
Early Games	20.50
Master Type	23.45
Math Blaster	29.30
Typing Tutor III	29.30
Word Attack	29.30
Speed Reader II	41.00
Spell-It	30.00
Mission Algebra	28.00
Turtle Tracks	24.00
Spinnaker Full Line	$CALL
Stickybear Series ea.	24.00

HOME-HOBBY

Beyond Castle Wolf	20.00
Copy II (//, Mac)	20.00
Champ Lode Runner	20.50
Dazzle Draw	35.15
F-15 Strike Eagle	20.50
Flight Simulator II	29.95
GATO	23.75
Home Accountant	43.95
Infocom Full Line	$CALL
Karateka	20.50
Lode Runner	21.95
Millionaire	29.30
Mind Prober	35.15
Newsroom	28.95
Newsroom clip art 1	17.95
One on One	25.50
Pinball Construct	25.00
Printshop	27.95
Printshop GL #1	16.95
Printshop GL #2	16.95
Printshop Refill	14.95
Sargon III (II, Mac)	29.30
Seven Cities-Gold	25.50
Skyfox	26.65
Spy Hunter	28.25
Super Zaxxon	21.95
Ultima III / IV	$CALL

HARDWARE

Amdex 300 12"	123.00
Amdex Color 300	225.00
Amdex Color 500	329.00
Amdex Color 600	385.00
RGB Interface	127.00
Buffered Grappler+	145.00
Dumpling GX	61.05
Echo II Plus	93.00
Grappler +	74.40
Mach III w/Fire	33.00
IIe 80Ram Card	CALL
Microfazer all models	CALL
System Saver	62.00
The Cricket //c	111.00
TG Select-A-Port	23.95
Thunderclock +	107.00
Trackhouse Key Pad	$CALL
Videx Ultraterm	189.00
QUARK HARD DISK	
QC-10 //ec, Mac	1030.00
QC-20 //ec, Mac	1369.00
Corvus Hard Disk	**$CALL**
MICRO SCI DISK DRIVES	
A5 Slimline IIe, IIc	178.00
Micro Sci C2 Cont.	53.00
HAYES MODEMS	
2400B External	$CALL
Smartmodem 1200	415.00
Micromodem IIe	$CALL

PRINTERS

Epson LX-80	215.95
Epson JX-80	493.95
Epson FX-85	339.95
Epson FX-185	479.95
Epson LQ-1500	899.00

DISKETTES

Elephant SS/SD	12.00
Elephant DDDS	21.00
Verbatim DDSS	16.00
Verbatim DDDS	22.00
Diskettes 3 1/2	26.65

RIBBONS CALL

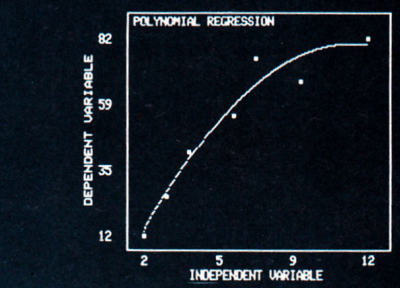
For fast delivery send cashier's check, certified check or money order. Personal and company checks allow 15 days. Shipping - Software ($2.50 min.). C.O.D. add an additional $5.00. Shipping - Hardware (please call). School P.O.'s, Add 3% ($3 min), 2%-10/net 15. Am. Ex.-5%, MC & Visa - 3%. NM Res. add 4.75% sales tax. Prices & availability subject to change without notice. All products are new and include factory warranty, therefore All sales are final. We do not guarantee compatibility. Products purchased in error subject to 15% restocking fee. Defective merchandise replaced with same item only. Not Responsible for typographical errors.

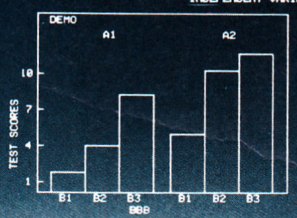
3204 NATL. PARKS HWY., CARLSBAD, NM 88220

FREE CATALOG

*Works with the Multram IIe & IIc cards from Checkmate Technology.

THE STATISTICS SERIES





Statistics Made Simple
Run Analysis Immediately
With **The Statistics Series**

STATS PLUS $200

Complete General Statistics Package
Research Data Base Management
Parametrics and Nonparametrics
Correlation, Regression

REGRESS II $150

Complete Multiple Regression Package
Stepwise, Simultaneous Solutions
Power Polynomial Solutions

ANOVA II $150

Complete Analysis of Variance Package
Analysis of Covariance, Randomized Designs

Apple II 48K, 1 or 2 Disk Drives,
DOS 3.3, ROM Applesoft

HUMAN SYSTEMS DYNAMICS

To Order—Call (800) 451-3030
(818) 993-8536 in CA
or Write
HUMAN SYSTEMS DYNAMICS
9010 Reseda Blvd., Suite 222
Northridge, CA 91324

VISA master charge

Listing continued.

```
999 :
1000  PRINT "QUICKSORT"
1100 L = 0:R = 38:SP = 0
1200 I = L:J = R + 1:K = SCRN( L,Y)
1300 I = I + 1: IF SCRN( I,Y) < K THEN 1300
1400 J = J - 1: IF SCRN( J,Y) > K THEN 1400
1500  IF I > J THEN 1600
1510 CI = SCRN( I,Y)
1520  COLOR = SCRN( J,Y)
1530  VLIN 0,10 AT I
1540  COLOR = CI
1550  VLIN 0,10 AT J
1560  GOTO 1300
1600  COLOR = SCRN( J,Y)
1610  VLIN 0,10 AT L
1620  COLOR = K
1630  VLIN 0,10 AT J
1700  IF J - L > = R - I THEN 1750
1710  IF I > = R THEN 1730
1720 SP = SP + 1:R(SP) = R:L(SP) = I
1730 R = J
1740  GOTO 1780
1750  IF L > = J THEN 1800
1760 SP = SP + 1:R(SP) = J:L(SP) = L
1770 L = I
1780  IF R > L THEN 1200
1800  IF SP = 0 THEN RETURN
1810 R = R(SP):L = L(SP):SP = SP - 1
1820  GOTO 1200
1999 :
2000  PRINT "INSERTION SORT"
2100  FOR J = 1 TO 38
2200 I = J - 1
2210 K = SCRN( J,Y)
2300  IF K > = SCRN( I,Y) THEN 2500
2400  COLOR = SCRN( I,Y)
2410  VLIN 0,10 AT I + 1
2420 I = I - 1
2430  IF I > = 0 THEN 2300
2500  COLOR = K
2510  VLIN 0,10 AT I + 1
2599  NEXT J
2600  RETURN
2999 :
3000  PRINT "BUBBLE SORT"
3100 BOUND = 38
3200 FLAG = 0
3210  FOR J = 0 TO BOUND - 1
3300  IF SCRN( J,Y) < = SCRN( J + 1,Y) THEN 3390
3310 CI = SCRN( J,Y)
3320  COLOR = SCRN( J + 1,Y)
3330  VLIN 0,10 AT J
3340  COLOR = CI
3350  VLIN 0,10 AT J + 1
3360 FLAG = J
3390  NEXT
3400  IF FLAG = 0 THEN RETURN
3410 BOUND = FLAG
3420  GOTO 3200
3999 :
4000  PRINT "SELECTION SORT"
4100  FOR J = 0 TO 37
```

Listing continued.

BECOME A PUBLISHED AUTHOR IN 6 EASY STEPS WITH THE PLAYWRITER™ SERIES

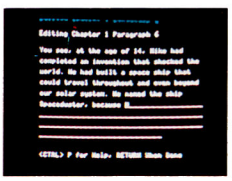
Select Your Topic

Choose from 4 PlayWriter titles: Tales of Me, Adventures in Space, Mystery!, Castles & Creatures. Each turns your computer into a creative writing assistant who asks you questions and offers suggestions. In this way PlayWriter walks you step by step through the entire story writing process.

1

Edit With Built-In Word Processor

Read your "first draft" on the screen and then use PlayWriter's edit option to make changes and corrections. You can make simple changes – such as spelling or grammatical corrections – or even do major revisions. You can revise and rewrite any parts of the story you'd like.



3

Create Your Own Hardcover Book

Publish your story by printing it out on the special paper included, and put the book together using the **bookjacket, colorful stickers, and full page illustrations** included in each package. (To make extra books, refill packs of book materials are available but not necessary.)

5

2

Write 1-1000 Different Stories

Create your own unique tales of intrigue and adventure with the guidance of PlayWriter's computer-assisted writing software. Remember, YOU'RE IN THE AUTHOR'S SHOES, and you can use PlayWriter again and again to write hundreds of different stories that will be yours and yours alone.

4

Print Your Stories

Print your stories onto any standard computer paper. PlayWriter will automatically organize your story like a regular book. It will print title and dedication pages, set the margins, number the pages, leave spaces for illustrations, and even print out a page all about the author – YOU!.

6

ENTER THE GREAT AMERICAN WRITING CONTEST

Win over $1,000.00 in prizes . . . PLUS publication and distribution of your book . . . PLUS "new author treatment" including multimedia attention . . . PLUS a computer for your school.

Winners will be selected in 3 age categories: Adventures in Space (Grades 4 and below); Castles & Creatures (Grades 5-6); Mystery! (Grades 7-12). EVERY ENTRANT WINS A PRIZE.

Get Started Now: Send for rules and entry forms. For dealer location or Visa/MasterCharge orders call: **(201) 679-0200.**

Send to **Woodbury Software**
127 White Oak Lane, CN 1001, Old Bridge, NJ 08857

PLAYWRITER SERIES

_____ Please send me the official "Great American Writing Contest" rules and entry forms.

_____ Please send me the PlayWriter titles indicated. Enclosed is $39.95 plus $2.50 shipping & handling for **each** title ordered. New Jersey residents add 6% sales tax.

Check Machine Type

☐ Apple II Series ☐ Commodore 64/128 ☐ IBM PC/PC Jr.

Quantity		Quantity	
_____	Tales of Me	_____	Adventures in Space
_____	Mystery!	_____	Castles & Creatures

Name _____ Child's Grade _____

Address _____ Phone _____

City _____ State, Zip _____

WOODBURY
Software For Success!
127 White Oak Lane, CN 1001, Old Bridge, NJ 08857

Contest co-sponsors include: D.C. Comics, Grolier Electronic Publishing, InCider, Run, Instructor Magazines.

Circle 200 on Reader Service Card.

FROM THE AUTHORS OF
Beneath Apple ProDOS™
NOW THERE'S . . .

Bag of Tricks 2™

By Don Worth and Pieter Lechner

***Bag of Tricks 2** does everything the original **Bag of Tricks** did . . .*

- ***FOUR** disk utility programs.*
- ***REPAIR** damaged diskettes.*
- ***RECONSTRUCT** blown catalogs.*
- ***EXAMINE** and **MODIFY** disk data.*
- *Full documentation, with **TUTORIALS.***

***PLUS** these **NEW** features:*

- *Operates with **ProDOS.***
- *Operates with the **PROFILE*** and **SIDER*** hard disks and with the new **3½" FLOPPY DRIVES** and most **RAM CARDS.***
- ***NOT COPY PROTECTED.***
- ***ONLY $49.95** for all four programs, on 5¼" diskette. Requires 64K.*

***SPECIAL OFFER** to **Bag of Tricks** owners:*

SAVE $20** by ordering directly from Quality Software. Send your original **Bag of Tricks** diskette with your order for **Bag of Tricks 2.

***ALSO** from Quality Software:*

***Beneath Apple DOS** by Worth and Lechner*
*Covers all facets of DOS 3.3 and previous Apple disk operating systems. Book. **$19.95.***

Beneath Apple ProDOS
by Worth and Lechner
*They've done it again! This time for ProDOS, Apple's new disk operating system. Book. **$19.95***

***Understanding the Apple II** by Jim Sather*
*Foreword by Steve Wozniak. Covers Apple II and Apple II Plus hardware, including the disk controller. Book. **$22.95***

***Understanding the Apple IIe** by Jim Sather*
*Similar to Understanding the Apple II, this book covers Apple IIe hardware. Book. **$24.95***

Universal File Conversion
by Gary Charpentier
*Moves files between any of the four operating systems used by Apple II, IIc, and IIe computers – DOS 3.3, CP/M, ProDOS, and Apple Pascal. Unprotected disk. **$34.95***

QS QUALITY SOFTWARE

21601 Marilla Street
Chatsworth, California 91311
(818) 709-1721

*Ask for Quality Software products at your computer store, or send the price of the software **plus** $2.50 for shipping and handling (**plus** 6% sales tax if a California resident) to Quality Software. VISA and MasterCard holders may phone their orders.*

**Apple and Profile are trademarks of Apple Computer, Inc. Sider is a trademark of First Class Peripherals.*

Listing continued.

```
4110 K = J
4120 CJ = SCRN( J,Y)
4200  FOR I = J + 1 TO 38
4210  IF SCRN( I,Y) > = CJ THEN 4300
4220 K = I
4230 CJ = SCRN( I,Y)
4300  NEXT I
4305  COLOR = SCRN( J,Y)
4310  VLIN 0,10 AT K
4320  COLOR = CJ
4330  VLIN 0,10 AT J
4400  NEXT
4500  RETURN
4999 :
5000  PRINT "SHELL SORT"
5005 H = 40
5100 H = (H - 1) / 3
5110  IF H = 0 THEN RETURN
5200  FOR J = H TO 38
5300 I = J - H
5310 X = SCRN( J,Y)
5400  IF X > = SCRN( I,Y) THEN 5600
5500  COLOR = SCRN( I,Y)
5510  VLIN 0,10 AT I + H
5520 I = I - H
5530  IF I > = 0 THEN 5400
5600  COLOR = X
5610  VLIN 0,10 AT I + H
5620  NEXT J
5630  GOTO 5100
5700 :
9000  TEXT : HOME : REM INSTRUCTIONS
9010 A$ = "SCREEN SORT DEMO"
9020  GOSUB 9600
9030 A$ = "BY P.C. LINCOLN"
9040  GOSUB 9600
9050 A$ = "AUGUST 1983"
9060  GOSUB 9600
9070  PRINT :A$ = "THIS PROGRAM DRAWS AN
      ARRAY OF STRIPES"
9080  GOSUB 9600
9090 A$ = "THEN OFFERS 5 WAYS TO SORT THE
     STRIPES"
9100  GOSUB 9600
9110 A$ = "YOU CAN COMPARE ALGORITHMS"
9120  GOSUB 9600
9130 A$ = "AGAINST EACH OTHER, OR AGAINST
     NEW DATA"
9140  GOSUB 9600
9150 A$ = "BEEPS SIGNAL START AND END OF
     SORTING"
9160  GOSUB 9600
9170 A$ = "CHOOSE 6 TO CHANGE THE PATTERN"
9180  GOSUB 9600
9190 A$ = "CHOOSE 0 TO EXIT"
9200  GOSUB 9600
9210  PRINT : PRINT "HIT ANY KEY TO START THE FUN.";
9220  GET T$: HOME : GR : RETURN
9600 T = LEN (A$):T = (40 - T) / 2
9610  IF T > 0 THEN PRINT SPC( T);
9620  PRINT A$: PRINT : RETURN
```

End of listing.

 Circle 155 on Reader Service Card.

November's Editors' Choice inCider Magazine

THE X-10 POWERHOUSE DOES EVERYTHING BUT PUT OUT THE CAT.

Model CP290

THE X-10 POWERHOUSE INTERFACES WITH YOUR APPLE TO CONTROL YOUR HOME...FOR SECURITY, COMFORT AND ENERGY SAVINGS.

This remarkable Interface lets you run your home through your Apple IIe or IIc and a mouse, keyboard or joystick.

When you're away, it makes your home look and sound lived in. When you're home, it can turn off the TV at night and wake you up to stereo and fresh brewed coffee in the morning. It can even turn on your air conditioner and control your heating.

SPECIAL COLOR GRAPHICS MAKE PROGRAMMING A SNAP. You simply pick a room from the display screen. Use your mouse, joystick or keyboard to position graphics of lights or appliances. Then follow on-screen instructions to program any light or appliance to go on or off whenever you choose. You can even control thermostats, light intensity and more.

THE WAY IT WORKS. The X-10 Powerhouse Interface is cable-connected to the Apple RS-232 port and plugged into a standard 110V outlet. After it is programmed, the Interface sends digitally encoded signals through your home wiring to special X-10 Modules. To control a lamp or appliance, you simply plug the electrical device into a Module and then plug the Module

into an outlet. The Interface can control up to 256 Modules throughout your home and won't interfere with normal use of lights and appliances.

There are plug-in Appliance Modules, Lamp Modules, Wall Switch Replacement Modules and Special 220V Modules for heavy duty appliances such as water heaters and room air conditioners. Plus Thermostat Controllers for central heating and air conditioning, Telephone Responders to control your home from any phone, and much more.

IT WON'T TIE UP YOUR COMPUTER. Use your computer only for programming. When you're finished, disconnect the Interface from the RS-232 port and keep it plugged into any convenient power outlet in your home. It will operate as a stand-alone controller with battery back-up and will run your home automatically.

SURPRISINGLY INEXPENSIVE. A Powerhouse System including the Interface, software and connecting cables costs less than $150. X-10 Modules are less than $20 each.

For the Dealer Nearest You Call: 1-800 526-0027
[in NJ: (201) 784-9700]
or, write to: X-10 (USA)
185A Legrand Avenue
Northvale, NJ 07647

X-10® POWERHOUSE
NUMBER ONE IN HOME CONTROL

Apple, Apple IIe and Apple IIc are registered trademarks of Apple Computer, Inc.

Circle 169 on Reader Service Card.

The Gemini 10X:
A REFORMED CHARACTER

Stop running around in circles. Your Gemini 10X printer can distinguish between O and 0 with downloadable characters.

by Phillip M. Jockell

It sounds like a scene from *Sesame Street*: What's the difference between O and 0? A lot—especially if you're working with printed program listings. Confusion, aggravation, and frustration greet the unobservant programmer who types an O instead of a 0 and vice versa.

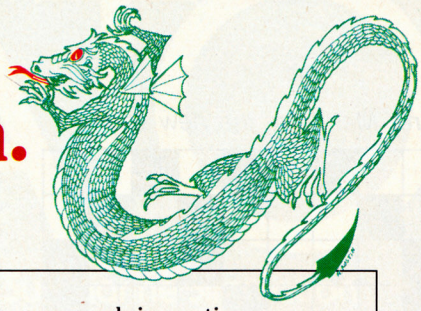
Some dot-matrix printers have the option to print zeroes with or without slashes. Unfortunately, Star Micronics' Gemini 10X doesn't. A solution exists, though, and it involves a powerful, but seldom used, capability of the Gemini 10X.

The Solution

The character shapes printed by the Gemini 10X are determined by either of two methods. The standard operating mode uses the character shapes stored in the printer's ROM (read only memory). Appendix K of the Gemini 10X manual shows the shapes of various characters stored in the printer's permanent memory. ROM being what it is, you're stuck with the characters as defined by the folks who built the printer.

The second method used to define characters is through *downloadable* characters—information the computer sends to the printer, which is the less intelligent device. In this case, the data to be transmitted are the character descriptions that will be used in place of those stored in the printer's ROM. These new shapes are stored in the printer's RAM (random access memory). This is the method we'll use to make slashed zeroes.

Big Game Hunting? Try Baggin' Our Dragon.



It's the biggest game in town

Our dragon, of course, is Wizardry—that unique series of computer recreation programs designed for Apple users who are seeking the ultimate "big game" challenge.

Since its debut, Wizardry has been the best-selling computer game of its kind.

For a very good reason:

Because Wizardry is more than just a game, more than a diabolically clever maze.

Wizardry is a complex world of variety and depth. A world of richness and pleasure.

Packed with suspense, full of surprises, Wizardry is enchanting—a compelling diversion that turns your leisure time into prime time.

Wizardry is powerful and sophisticated. A simple command system, 3D maze displays and superb programming provide you with month after month of involvement and satisfaction.

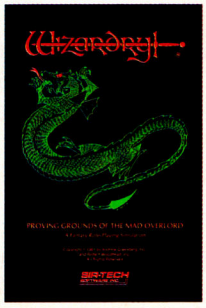
Four years old and still growing, the game is already recognized by critics and game lovers as a classic.

Simply stated, Wizardry is the finest fantasy role-playing computer game you can buy.

Set your sights on the best. Track down Wizardry—the biggest game in town.

Enter the World of Wizardry®

A Classic Encounter

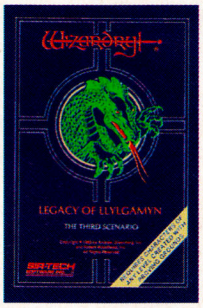


Proving Grounds of the Mad Overlord

The First Scenario

Unlike any other game you have ever played. A fascinating 10-level maze full of monsters, sorcery, traps and treasures. As you gain skills, the characters you create grow stronger, richer, wiser and better able to survive. The final goal is elusive. Your experience . . . unforgettable.

Twice voted "All Time Most Popular Computer Program" —Softalk Readers

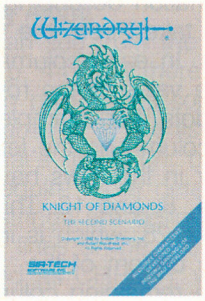


Legacy of Llylgamyn

The Third Scenario

A spellbinder that advances the classic traditions of Wizardry. Find the great dragon L'kbreth and save the people of Llylgamyn. Includes full screen maze display and Windo-Wizardry, the revolutionary pop-up window graphics system. Requires brave adventurers of any level developed in PROVING GROUNDS.

". . . A Landmark in Graphics Advancement" and "The Best Yet" —Softalk

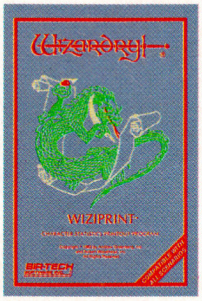


Knight of Diamonds

The Second Scenario

This classic journey should only be attempted with those Wizardry heroes who have attained the 13th level of ability in PROVING GROUNDS. Their challenge—and yours—to adventure through a six-level maze and become the Knight of Diamonds. First-rate fantasy!

Awarded "Best Adventure Game for the Home Computer"
—Game Mfrs. Association of America



Wiziprint

Character Statistics Printout

A helpful utility program that prints the possessions, attributes and known spells of all your Wizardry characters. Quick, neat and easy-to-read. For use with 80-column printers. Compatible with all Wizardry scenarios. A real timesaver!

"Wiziprint is a very handy utility disk for ardent Wizardry players"
—Roe R. Adams III, Softalk

LOOK FOR THE DRAGON—
SYMBOL OF WIZARDRY.
PROMISE OF EXCELLENCE.

All software available for Apple II series computer 48k
Coming soon for the Macintosh
Proving Grounds also available for IBM PC and PCjr 64k

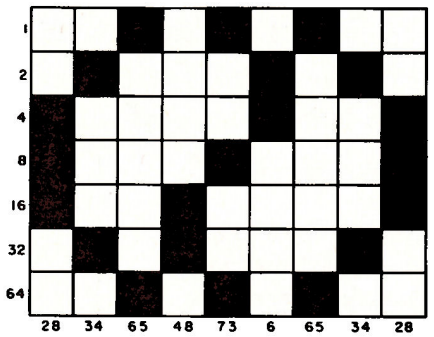
SIR-TECH SOFTWARE INC.

6 MAIN STREET • OGDENSBURG, N.Y. 13369 • (315) 393-6633 ***LEADERS IN COMPUTER FANTASY ROLE-PLAYING***

Apple is a registered trademark of Apple Computer, Inc. IBM is a registered trademark of International Business Machines. Wizardry is a registered trademark of Sir-Tech Software, Inc.

Circle 218 on Reader Service Card

Figure. Matrix for the new zero.



Chapter 8 in the Gemini 10X manual explains downloadable characters. You should review this chapter, but you don't need to master its contents before you use the program outlined here.

The Method

Before you start the program, look at the way new characters are defined and stored in the RAM area of the 10X. Designing the new zero was simple: I used graph paper to prepare a "map" of the new character, then converted it to a form the printer could use.

First, I plotted a seven-row by nine-column matrix (see the **Figure**). The numbers running vertically along the left side are values assigned to each of the even-numbered horizontal rows. Listed as powers of two, these values start at the top with 1 (2^0) and end at the bottom with 64 (2^6).

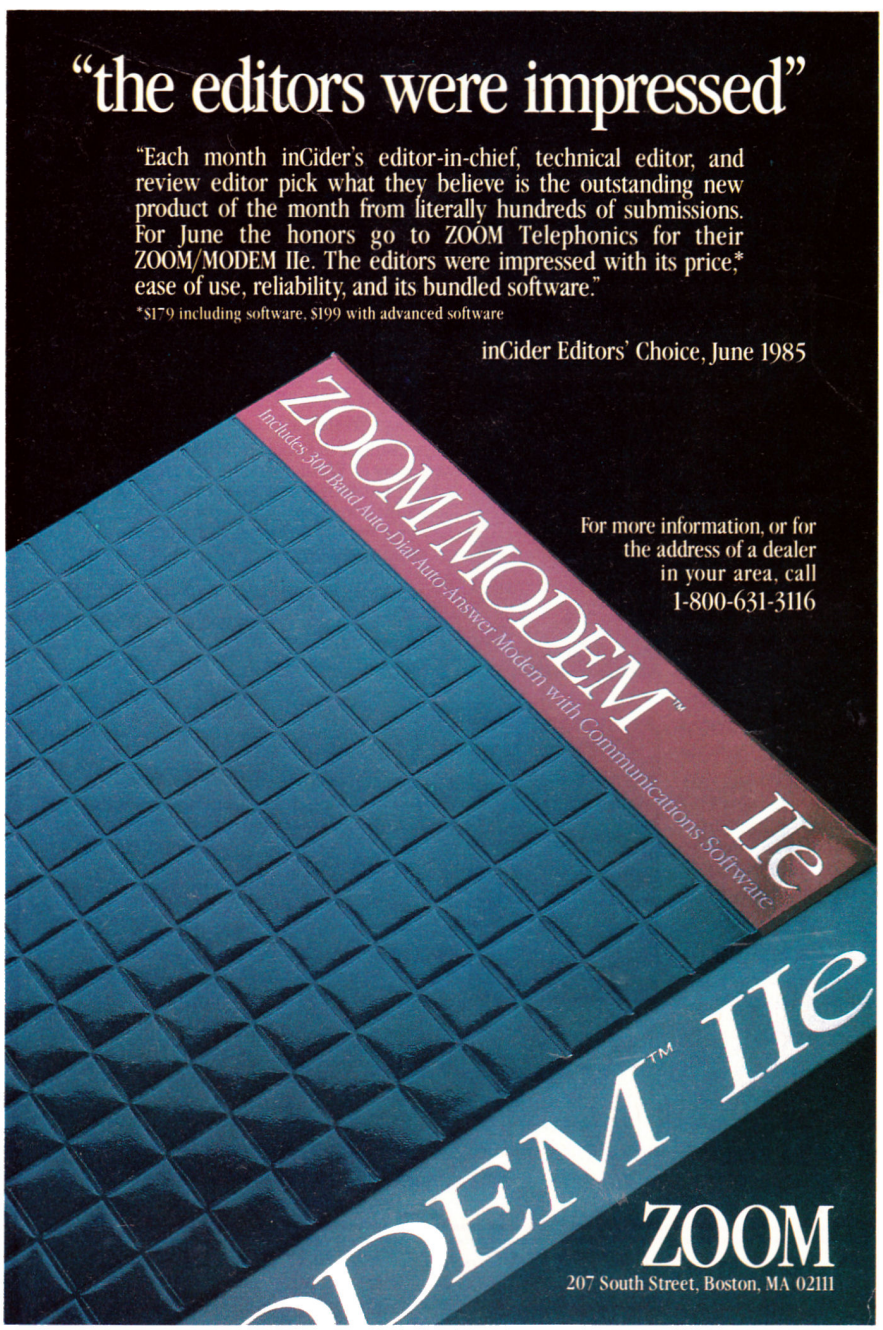
Next, I put a dot in each of the matrix squares where I wanted ink to hit the paper. The printer manual advises that no two dots can be side by side on the same horizontal line, but doesn't explain why. This limitation might be aggravating if you were redesigning an entire set of characters, but it does not pose a problem in building the new zero.

It helps to sketch your character on top of the matrix to see how it will look. Nonetheless, my first redesigns were rather amusing. One looked like a capital O wearing a cowboy hat, so don't be surprised if your first tries don't look exactly as you envisioned them (especially if you make a math error, as you'll see later). After I was satisfied with the new character, I was ready to put it into a numerical form the computer could send to the printer. (See the **Figure**.)

The information describing the new zero is taken from the vertical columns. In each column, I summed the value of the rows containing dots. For example, look at the first column on the left. Dots appear in the rows having the values 4, 8, and 16. This column's total is 28, which is indicated at the bottom of the column. The remaining columns were totaled similarly, and the results are recorded at the bottom of each column. (A math error here can create a strange-looking character.)

These totals—and a wee bit more—are all you need to describe the new zero to the printer. Together, the information appears as:

```
CHR$(27) CHR$(42) CHR$(1) c1 d1
t1 t2 t3 t4 t5 t6 t7 t8 t9
```



The CHR$(27) is actually *escape*, which precedes most control sequences sent to the Gemini 10X printer and identifies them as control sequences. The following character strings (42 and 1) comprise the command to accept data describing a character shape. Next comes the ASCII value of the character you want to define (c1). In this case, you are redefining 0, CHR$(48).

The d1 in the command represents descender data and will always be a 1 or a 0. A descender is the part of the character that extends below the main body of the character, as in a lowercase "y." Obviously, the number 0 doesn't have a descender, so the descender datum is 0 in this instance. (Chapter 8 in the printer manual details how to handle characters with descenders.)

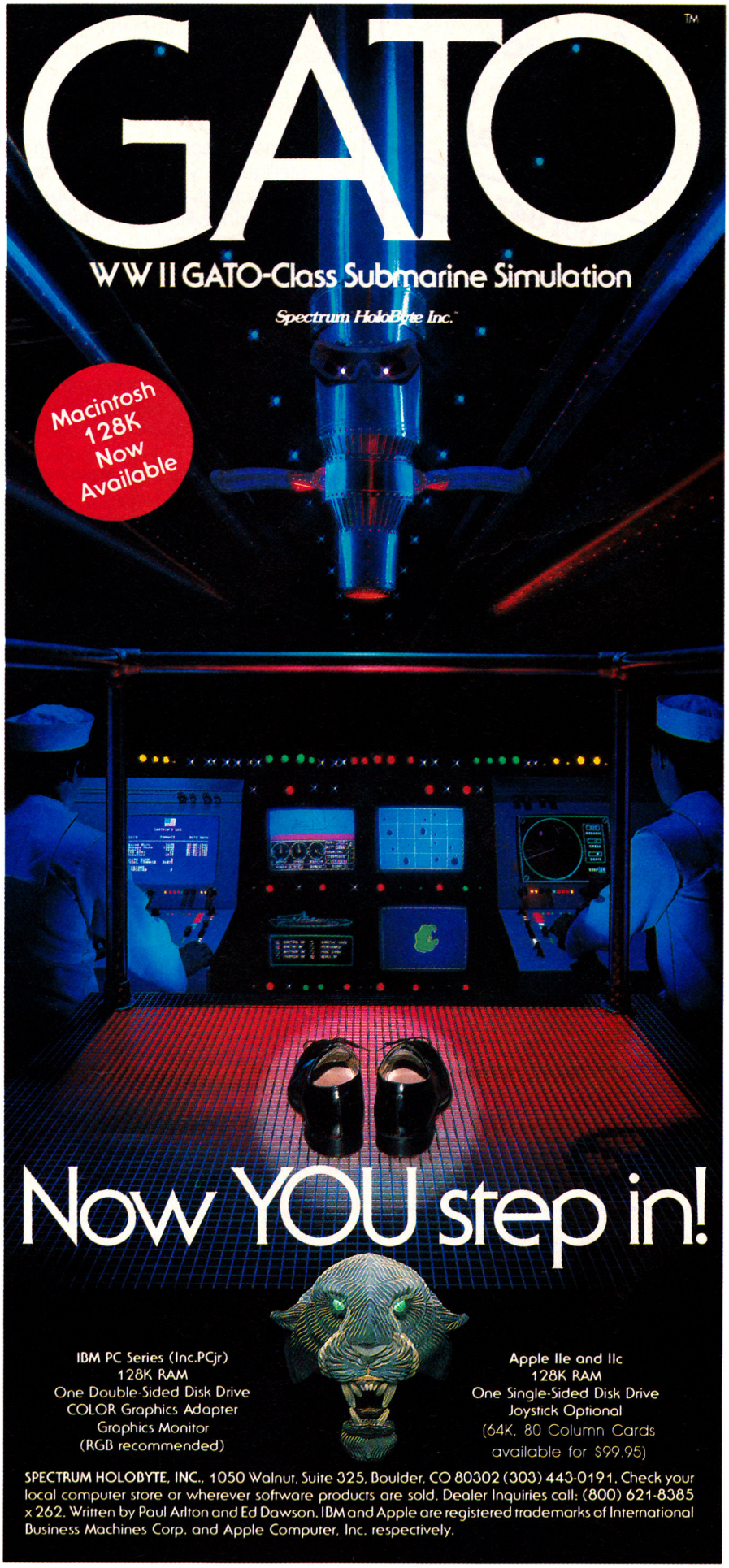
Now you must combine the above control sequences with the matrix column totals described earlier. The data t1 through t9 represent the totals (left to right) of the columns shown in the **Figure**. When you combine the information, you receive the following data:

```
CHR$(27) CHR$(42) CHR$(1)
CHR$(48) CHR$(0) CHR$(28)
CHR$(34) CHR$(65) CHR$(48)
CHR$(73) CHR$(6) CHR$(65)
CHR$(34) CHR$(28)
```

Stringing Along

You can see from the **Program listing** (p. 44) that there is little involved in putting this solution to work. Remarks in the listing explain what's going on, but some points require more detail.

Four strings are defined in the first four lines of the program. D$ is defined as CHR$(4), which is control-D. In turn, control-D identifies all DOS (disk operating system) commands. E$ is defined as escape and has two functions: It alerts the printer that it must accept the following characters as printer commands, and it also serves as a one-key input in the program. Since I have an Apple parallel-printer interface card, I$ is defined as control-I for interface



Protect the fruits of Apple!

Call (800) 847-4176

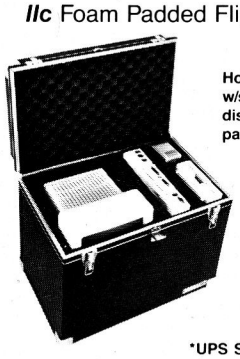
$74.00*
*UPS Included.

IIe Foam Padded Carrying Case
with
Removable Cover

Macintosh
Carrying Case
$104.50*

*UPS Shipping Included.
shoulder strap
$5.25

IIc Foam Padded Flight Case



Holds: *IIc*, monitor w/stand, external disc drive, power pack, mouse.

$179.50*

*UPS Shipping Included.

Call for Complete Computer Case Catalog.

For Fast Service!
MasterCard VISA AMERICAN EXPRESS

CREDIT CARD CUSTOMERS
CALL TOLL FREE
800-847-4176
(outside N.Y. State)

Fiberbilt
CASES, INC.
601 West 26th Street
New York, New York 10001-1199
(212) 675-5820 (N.Y. State only)
(800) 847-4176 *(Toll Free)*

commands. Because the system is "intelligent," you must give specific instructions to all parts of it. The last string, R$, is defined as CHR$(13) which is return (another one-key input).

After you make the definitions, lines 50 through 90 clear the screen and display a message explaining the program. This short description and an opportunity to gracefully exit the program are preferable alternatives to unknown happenings that result in the sole, sinister] prompt left on the screen at the end of BASIC programs.

Lines 100 through 120 let you decide whether to continue or quit the program. There is very little here that isn't standard practice. In line 100, POKEing 0 into location −16368 clears the keyboard buffer. This avoids erroneous responses caused by key bounce, accidentally hitting the keyboard, and the like. Using the POKE with every GET statement results in fewer operator errors. Lines 110 and 120 limit valid responses to Y (yes) or N (no).

Once you run the program, lines 140 through 200 give you the opportunity to get the printer ready before the computer sends data to it (and give you one last opportunity to exit the program). These options work the same way as the previous yes/no option, but the screen format isn't quite the same. Lines 210 and 220 direct output to the printer and prevent the echoing of data on the monitor screen. Line 230 prints a line containing the original zero for later comparison to the new model.

Lines 240 through 260 contain the power of this program. As the REMARK points out, line 240 copies the ROM character definitions into RAM. Keep in mind that if you send only one character definition to RAM, that's the only character the printer will know how to make. The command expressed in line 240 simply copies all the ROM shape descriptions into RAM so you don't have to re-create the entire font to change only one character.

Line 250 contains the command and the description defining the new zero, while line 260 tells the printer to actually use the downloaded character set. At this point, you can switch between the ROM characters and those stored in RAM with:

```
CHR$(27) CHR$(36) CHR$(0)
```

One peculiarity of the printer is that turning downloadable characters on or off during a line affects all characters in that line. If you select RAM characters halfway through a printed line, all the characters on that line will be printed using RAM characters. The same is true if you select ROM characters: The entire line is printed from ROM characters.

The final lines of the program show what the new zero looks like, along with the letter O for contrast, and return output to the monitor screen.

After you run the program to make sure it performs as advertised, delete line 230 and lines 270 through 300 to avoid wasting a sheet of paper each time you use the program.

For Clarity's Sake

The technique presented here can improve the readability of your program listings and may even clarify your word processor's output. Put lines 240–260 to work by adding them to a utility program.

The more ambitious among you may even implement your own character set for the 10X. Imagine printing in Old English, Goudy, or Times Roman. How about converting the fonts in popular videographic writing programs to work with the 10X? Or maybe even writing a program to handle the conversion for you?

As for me, I think I'll tackle that ridiculous-looking lowercase "j" the 10X makes.■

Address correspondence to Phillip M. Jockell at Route 1, Box 268, Glendale, KY 42740.

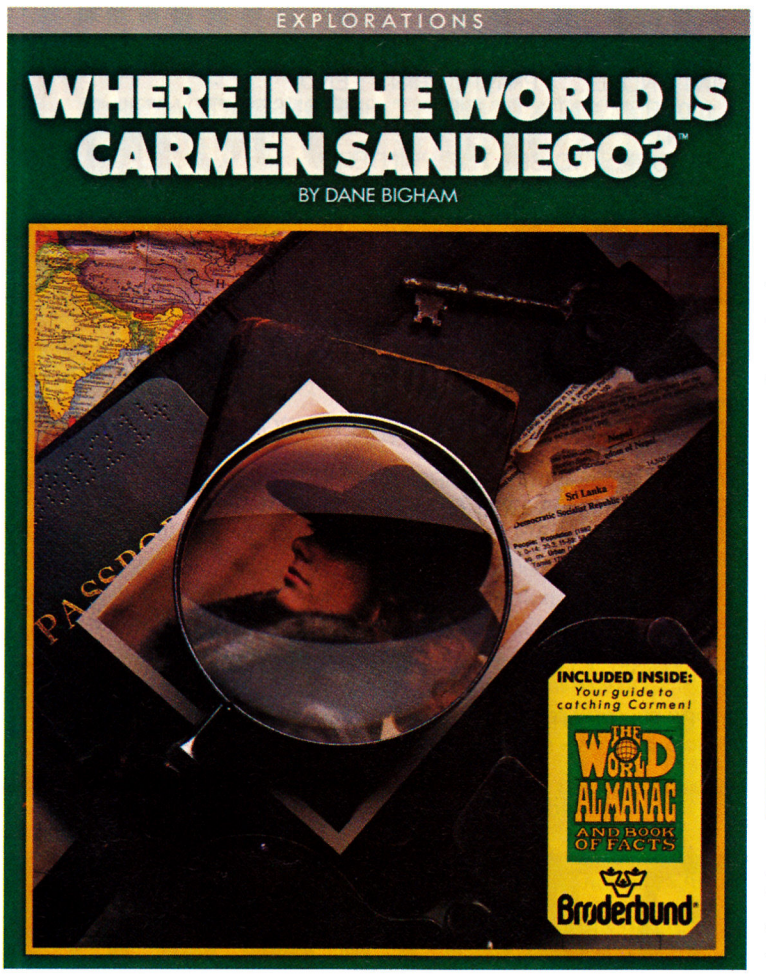
MYSTERY! INTRIGUE! ADVENTURE! EXPLORE THE WORLD'S GREAT CITIES AS YOU STALK A MASTER THIEF TO THE FAR CORNERS OF THE GLOBE!

"Excuse me, have you seen this woman?"

EXPLORATIONS

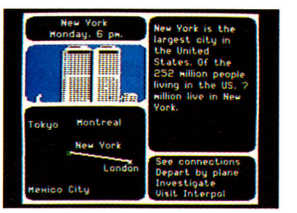
WHERE IN THE WORLD IS CARMEN SANDIEGO?™

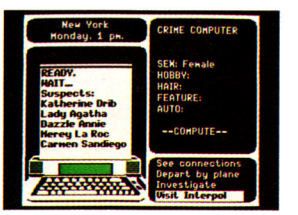
BY DANE BIGHAM



SOMEONE HAS MADE OFF WITH the Statue of Liberty's torch...and you've been assigned to the case! This could only be the work of *Carmen Sandiego and her gang*—the dastardly crew that has sworn to swipe each and every one of the world's most famous landmarks and treasures.

You're off on a whirlwind international chase! From London, to Bamako, to Peking, to Kathmandu...you'll find yourself in one strange city after another, with only your Crime Computer and your trusty copy of The World Almanac to guide you. You'll learn to use your computer and Almanac together to find your way around and decipher the clues you uncover. And, with enough dogged detective work, you'll soon collar the cunning culprit.





But don't get overconfident! The Mona Lisa, The Crown Jewels... you've got more treasures to protect, more cases to crack, more crooks to catch.

So now that you know what you're up against, what in the world are you waiting for?

WHERE IN THE WORLD IS CARMEN SANDIEGO? *combines all the best aspects of graphic adventures, mysteries, and arcade animation in a captivating crook's tour of the world. It comes complete with* The World Almanac® *and Police Dossier on Carmen and her gang. Players can work together, with one operating the computer while the other scours The Almanac and Dossier for vital information. With 10 possible suspects, 30 cities, and nearly 1,000 clues,* Carmen Sandiego *is a different game every time you play—for endless hours of family entertainment.*

Brøderbund®

WHERE IN THE WORLD IS CARMEN SANDIEGO? is available for Apple personal computers. Look for it at your favorite Brøderbund Software dealer. For more information about Brøderbund products, please write us at 17 Paul Drive, San Rafael, California 94903-2101. Apple is a registered trademark of Apple Computer, Inc. The World Almanac is a registered trademark of Newspaper Enterprise Association, Inc. ©1985 Brøderbund Software, Inc.

Circle 210 on Reader Service Card.

Program listing. *Slashed zeroes for the Gemini 10X printer.*

```
10 D$ = CHR$ (4): REM CONTROL-D (FOR DOS COMMANDS)
20 E$ = CHR$ (27): REM ESCAPE (FOR PRINTER COMMANDS & ONE KEY INPUTS)
30 I$ = CHR$ (9): REM CONTROL-I (FOR INTERFACE COMMANDS)
40 R$ = CHR$ (13): REM RETURN (FOR ONE KEY INPUTS)
50  HOME
60  PRINT "THIS PROGRAM WILL MAKE THE GEMINI 10X"
70  PRINT "PRINTER MAKE SLASHED ZEROES."
80  PRINT : PRINT
90  PRINT "IS THAT WHAT YOU WANT TO DO? > ";
100  POKE - 16368,0: GET A$: REM (THE POKE CLEARS THE KEYBOARD BUFFER)
110  IF A$ = "N" THEN PRINT "NOPE....": PRINT : PRINT : END
120  IF A$ < > "Y" THEN 100: REM ONLY "Y" OR "N" RESPONSE ALLOWED
130  PRINT "YEP": PRINT : PRINT
140  PRINT "> < PRESS <RETURN> TO SET THE PRINTER"
150  PRINT "       PRESS <ESCAPE> TO QUIT"
160  VTAB 8: HTAB 2: REM POSITION THE CURSOR BETWEEN THE ARROWS IN LINE 140
170  POKE - 16368,0: GET A$: REM (THE POKE CLEARS THE KEYBOARD BUFFER)
180  IF A$ = E$ THEN PRINT "*": VTAB 12: END
190  IF A$ < > R$ THEN 170: REM ONLY <ESCAPE> OR <RETURN> RESPONSE ALLOWED
200  PRINT "*"
210  PRINT D$;"PR#1": REM DIRECT OUTPUT TO THE PRINTER (INTERFACE) AT SLOT #1
220  PRINT I$;"80N": REM    TURN OFF PRINTING TO THE VIDEO SCREEN (AN INTERFACE COMMAND)
230  PRINT "    The old zero - > 0"
240  PRINT E$;"*"; CHR$ (0);: REM DOWNLOAD THE PRINTER'S ROM CHARACTER SET INTO RAM SO IT CAN BE
     MODIFIED
250  PRINT E$; CHR$ (42); CHR$ (1); CHR$ (48); CHR$ (0); CHR$ (28); CHR$ (34); CHR$ (65); CHR$ (48); CHR$ (73);
     CHR$ (6); CHR$ (65); CHR$ (34); CHR$ (28);: REM REDEFINE THE "0" SO IT HAS A SLASH
260  PRINT E$; CHR$ (36); CHR$ (1): REM TELL THE PRINTER TO PRINT USING THE DOWNLOADED CHARACTER SET
270  PRINT "The letter 'oh'    - > O"
280  PRINT
290  PRINT "The new zero      - > 0"
300  PRINT : PRINT
310  PRINT D$;"PR#0": REM REDIRECT OUTPUT TO THE VIDEO SCREEN
320  PRINT : PRINT : PRINT
330  PRINT "ALL DONE....": PRINT : PRINT
```


WE ARE NOT PIRATES!

but we're not fools, either.

We're serious programmers and software users who just want to have backup copies of any software we own. Hardcore COMPUTIST magazine shows us how to make backups of commercial software regardless of the maker's attempt to stop us from having legal copies. Don't let them stop you from protecting your own rights.

Remove copy-protection

from your valuable library of expensive software. The publisher of Hardcore Computist has been showing subscribers how to unlock and modify commercial software for the past 4 years. Don't be one of the users abused by user-FIENDLY locked-up software. Subscribe.

SUBSCRIPTION RATES FOR 6 ISSUES: U.S.: $20, U.S. first class: $24, Canada: $34, Mexico: $39, Foreign: $60, Sample copy: US: $4.75, other: $5.75. US funds drawn on U.S. bank. In Washington add 7.8% tax. Send funds to:

Hardcore COMPUTIST, PO Box 110846-I, Tacoma, WA 98411

☐ NEW subscriber ☐Renew my subscription

Name _____

Address _____

City _____ State _____ Zip _____

Country _____ Phone _____

VISA/MC _____ Exp. _____

Signature _____

Circle 76 on Reader Service Card.

Our word processing plum will get more juice from your Apple®.

WordPerfect word processing for Apple IIe/IIc.

If you have ever felt shortchanged by your IIe or IIc word processing, it's probably not because your Apple is rotten. It's more likely a worm in your software.

WordPerfect word processing software is designed to get the highest possible performance from your Apple. The same functions and features that have made WordPerfect one of the best-selling word processors for PCs, make it the perfect word processor for your Apple.

Clear and simple.

WordPerfect is easy to use. Most functions require just one or two keystrokes. And on-line help screens and a step-by-step manual make learning a breeze.

With WordPerfect, what you see is what you get. On-screen formatting ends the guesswork, so there are no format surprises when you print your document.

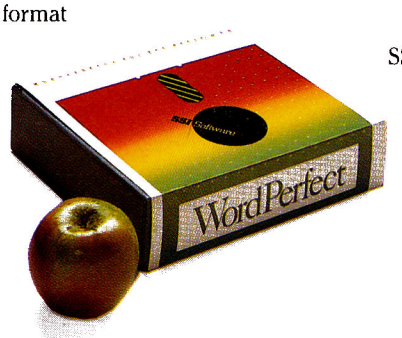
Functional and powerful.

Even the most demanding word processing functions are handled smoothly and thoroughly by WordPerfect. Like footnotes, concurrent printing and editing, macros, redefining of headers and footers, and an optional 50,000-word spelling dictionary. Functions not found on many word processors. Functions which allow WordPerfect to squeeze more juice than ever before out of your Apple.

And affordable.

With all it has to offer, WordPerfect for the Apple IIe and IIc sells for only $179. Add just $30 for the spelling dictionary. It's a small price to pay for perfection.

For a demonstration or more information, see your Apple dealer. Or write or call:

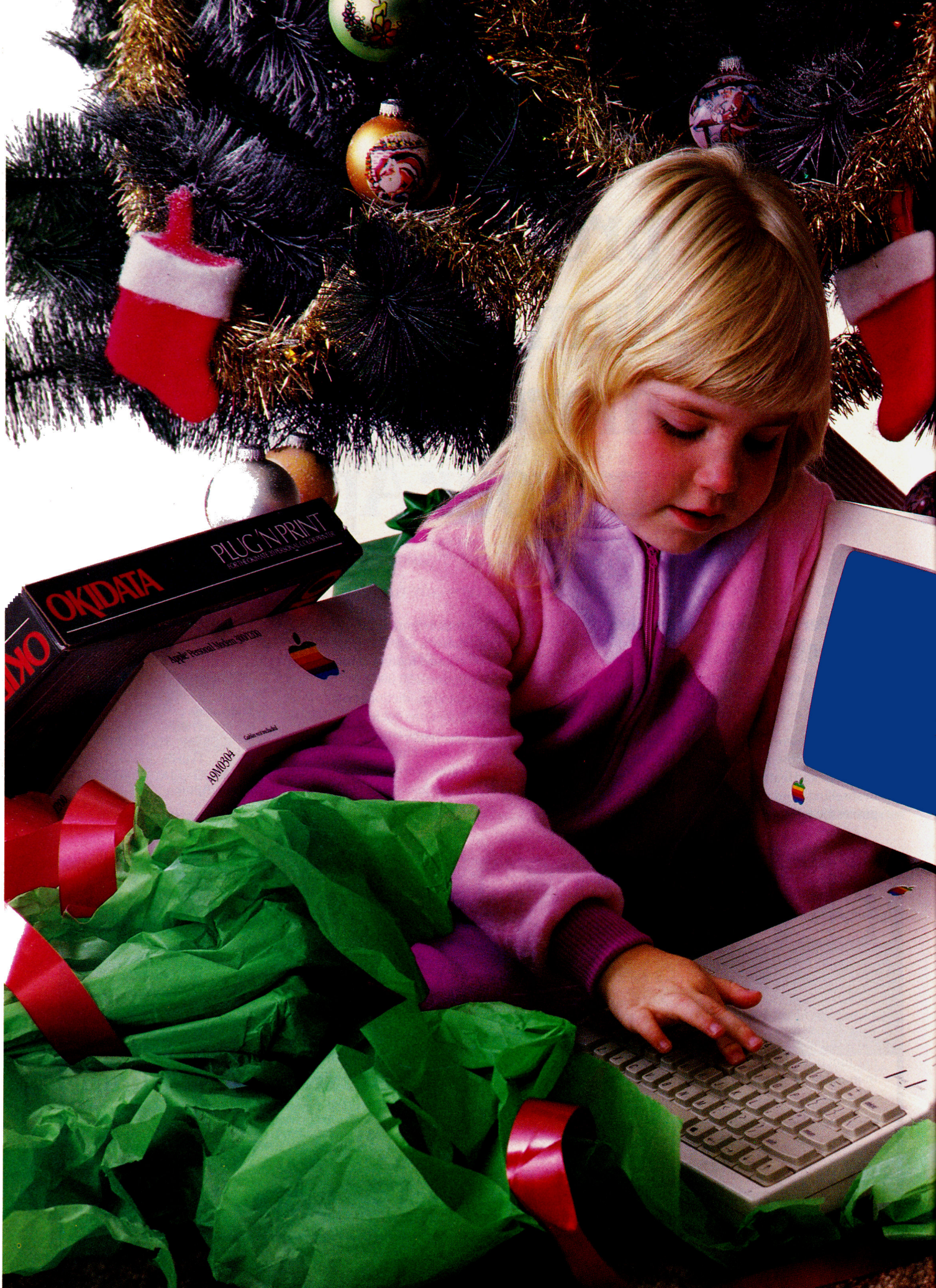


SSI Software
288 West Center Street
Orem, Utah 84057
Information: (801) 227-4020
Order Desk: 1-800-321-4566,
Toll-free

SSI Software
Reaching for perfection.

Circle 150 on Reader Service Card.

Apple is a registered trademark of Apple Computer, Inc.


OKIDATA
PLUG'N PRINT
A9M0304

HOLIDAY GIFT GUIDE

Before you journey into the recesses of your local shopping mall this season, thumb through our helpful guide. From whimsical stocking stuffers to practical peripherals, we know you'll find something for every Apple fan on your list.

The Wish List

Reasonably priced gifts that are practical, tempting, or off the wall. . . .

Racter

Do you get lonely during those late nights at your computer? Boot up Racter and spark up a conversation. Racter is a game with a 2800-word vocabulary and a knowledge of English grammar, and it'll respond to your questions at the keyboard. Mindscape used some of the latest advancements in artificial intelligence and speech to produce Racter. $44.95 from Mindscape, 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667.

Captain Goodnight and the Islands of Fear

Sit for hours in front of a Christmas movie? Why not star in Captain Goodnight? You're the superhero of the '80s, on a mission to save the world from the evil Dr. Maybe's Doomsday Machine. Captain Goodnight is none too bright, but the color graphics are spectacular. $34.95 from Broderbund, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

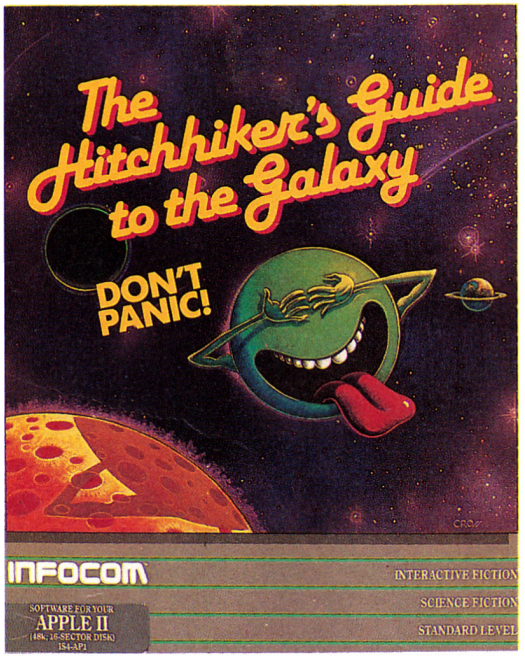
Science Kits

Every scientist worth his or her Periodic Table knows the importance of accuracy in successful experiments. Temperature Lab includes a temperature sensor and an alcohol-bulb thermometer to check readings against the computer. $99.95 from Hayden Software, 650 Suffolk Street, Lowell, MA 01854, (617) 937-0200.

Disk Holder

Keep your disks safe in a solid oak, roll-top storage chest from Smith and Bellows. You can easily find any of the 70 disks you can store in this nicely finished chest, and the oak protects them from static charges. $59.95 from Smith and Bellows, P.O. Box 668, Amherst, NH 03301, (603) 889-5311.

Of course, our gift guide's just a sampler of items available for your Apple (and we can't endorse the products' performance).



The Hitchhiker's Guide to the Galaxy

Travel light as you hitchhike across the galaxy with Arthur Dent and Ford Prefect in this all-text adventure based on the popular book and TV series. $39.95 from Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140, (617) 492-6000.

F-15 Strike Eagle

See if you have the right stuff to be a fighter pilot in F-15 Strike Eagle, an air-combat simulation that challenges your abilities with seven missions at four skill levels. Get your wings for $34.95 from MicroProse Software, 120 Lakefront Drive, Hunt Valley, MD 21030, (301) 667-1151.

Elfware

Children (and adults, too) can't help but smile with Elfware—three early-learning programs that teach letter and number recognition and hand-eye coordination, all to an enchanting classical-music score. $17.50 each or $39.95 for the set (a holiday special) from Elfware, P.O. Box 118, Pollock Pines, CA 95726, (916) 644-3300.

Turbo Pascal

The third version of Turbo Pascal executes and compiles twice as fast as the second. Now it also features graphics, optional binary-coded decimal support, I/O redirection, and a memory-mapped editor. Turbo Pascal 3.0 sells for $69.95. If you have the 2.0 version, you can get a $39.95 credit on trade-in from Borland International, 4113 Scotts Valley Drive, Scotts Valley, CA 95066, (408) 742-1133.

Fontrix

The medium is the message. Expand your typographical horizons with this character-generator package—it adds numerous type styles, rules, flowcharts, and more to turn humdrum print into dynamite graphics. $95 from Data Transforms, 616 Washington Street, Suite 106, Denver, CO 80203, (303) 832-1501.

Party Quiz Game

Your computer can be the life of the party. The Party Quiz Game asks questions on a variety of topics to test your trivia knowledge. $49.95 from Suncom, 260 Holbrook Drive, Wheeling, IL 60090, (312) 459-8000.

Fantavision

Create your own animation on your Apple II with Fantavision, a special-effects generator and full-screen animation system. $49.95 from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

MouseWrite

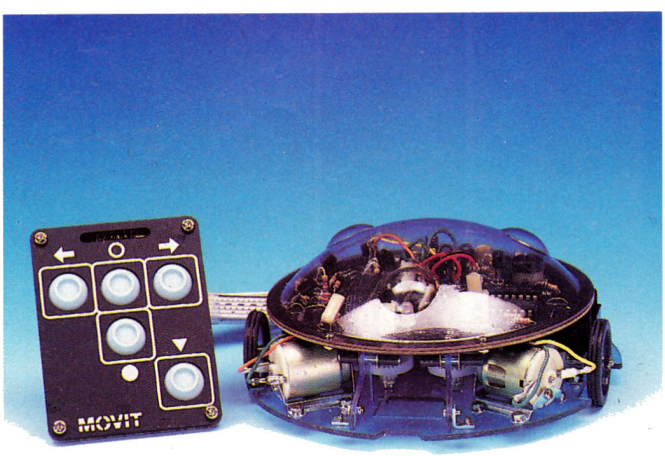
You can now do word processing on your Apple with a mouse. MouseWrite's pull-down menus, windowing, and mouse support all bring Mac-like ease of use to your //c or enhanced //e. $124.95 from Roger Wagner Publishing, 10761 Woodside Avenue, Suite E, Santee, CA 92071, (619) 562-3670.

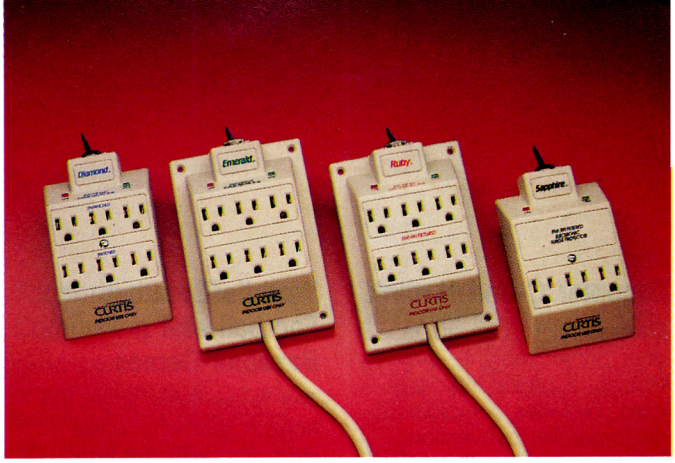
Gato

Command your own submarine in Gato, a World War II simulation game. You'll participate in heroic missions that range from rescuing a downed pilot to attacking patrol boats. $39.95 from Spectrum Holobyte, 1050 Walnut Street, Suite 325, Boulder, CO 80302, (303) 443-0191.

Apple Pets

Robots are here—the Memocon Crawler takes orders from your Apple. $74.95 from OWI Inc., 1160 Mahalo Place, Compton, CA 90220, (213) 638-4732.





Curtis Surge Protectors

This line of gems is an Apple II's best friend. The Curtis electronic surge protectors guard your computer and system hardware against voltage surges. The Diamond, Emerald, Ruby, and Sapphire all have an on/off switch for complete system power down/power up. Also available on some units is EMI-RFI filtering and a 6-foot power cord. From $49.95 to $89.95; from Curtis Manufacturing, 305 Union Street, Peterborough, NH 03458, (603) 924-3823.

X-10 Powerhouse

Come home for the holidays to a house controlled by your Apple. The X-10 Powerhouse takes care of turning on the tree and leaving a light on for Santa, while all through the house not a computer is stirring. Approximately $135 (depending on the size of your home) from X-10 USA, 185A Legrand Avenue, Northvale, NJ 07647, (201) 784-9700.

Stocking Stuffers

A little something for everyone. . . .

Computer Museum Cards

I'll see your Pascal and raise you two Charles Babbages. Liven up your game with playing cards sporting portraits of Pascal as the Jack, Ada Lovelace as the Queen, and Charles Babbage as the King. $9.95 from The Computer Museum Store, Museum Wharf, 300 Congress Street, Boston, MA 02210, (617) 426-2800.

Boston Computer Society Membership

Searching for high-tech answers to high-tech questions? The Boston Computer Society, considered the most prestigious user group in the country, is dedicated to helping you get the most out of your computer. A one-year membership costs $28. The Boston Computer Society, 1 Center Plaza, Boston, MA 02108, (617) 367-8080.

Screenwipes

Make sure you're seeing all you can on your monitor. Clean your screen once a week with Screenwipes—individually wrapped towelettes similar to Wash 'n' Dries. 50 packets (a one-year supply), $20, from Aldine Paper Company, 315 Park Avenue South, New York, NY 10010, (212) 505-1000.

Delphi

Modem users needn't consult a sybil to subscribe to Delphi—it's a consumer-oriented, straightforward online information service. Starter kit, $29.95 (command card plus one free evening hour) from General Videotex Corporation, 3 Blackstone Street, Cambridge, MA 02139, (800) 544-4005, (617) 491-3393.

Colored Disks

Brighten up your drab, run-of-the-mill software collection with colored floppy disks from Fuji. Boxes of ten disks in assorted hues (red, blue, green, beige, and gray) are priced at $22 (single-sided) and $30 (double-sided). Fuji Photo Film U.S.A., 350 Fifth Avenue, New York, NY 10118, (212) 736-3335.

First Touch Keystrip

Shocking, but true. Avoid static-electricity shocks with the 3M static "Touch Me First" pad—an 11-inch adhesive strip that attaches to your computer keyboard. $19.95 from 3M Static Control Systems Div., Box 2963, Austin, TX 78769, (512) 834-6563.

Beagle Bros Chart

No programmer should be without a Peeks, Pokes, and Pointers wall chart. It's the perfect stocking stuffer at the perfect price—it's free from Beagle Bros, 3990 Old Town Avenue, Suite 102C, San Diego, CA 92110, (619) 296-6400.

Diskribe

Write on it—your disk sleeve, that is—with Diskribe markers' silver or gold quick-drying, permanent ink. $2.50 each from Sanford Corporation, 2740 Washington Boulevard, Bellwood, IL 60104, (312) 547-6650.

inCider BBS E-Mail

If you haven't received any good mail lately, open an E-Mail box on *inCider*'s bulletin-board system. Call (603) 924-9801 with your modem. Once you're verified, you can access bulletins, downloads, and specialty boards. Best of all, it's free.

Grappler C and Hotlink

Orange Micro can guide your printer tonight—the Hotlink, a printer-interface card, provides complete serial-to-parallel conversion, letting all the most popular printers work with your //c. The intelligent Grappler C, a printer-interface card, includes special software that provides graphics screen-dump capabilities. $69 for Hotlink, $119 for Grappler C. Both from Orange Micro, 3150 East La Palma, Suite I, Anaheim, CA 92807, (714) 630-3622.

//e Enhancement Kit

It's new and improved! Give your favorite //e owner an enhancement kit (65C02 microprocessor, two new monitor ROM chips, and one new character-generator ROM chip) to upgrade his or her system. $70 from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, (408) 996-1010.

Computer Insurance

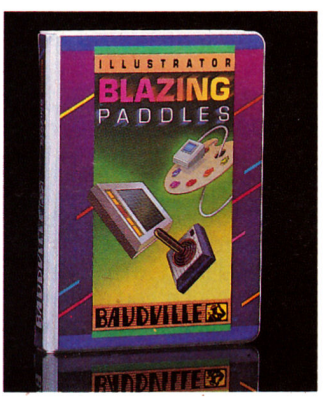
Gotcha covered. Protect your Apple investment from theft and damage with computer insurance. $39–$69 per year from Safeware, 2929 North High Street, Columbus, OH 43202, (614) 262-0559.

World's Greatest Football and Baseball Games

The Super Bowl is on the horizon, but why waste your time with the tube when you could be playing The World's Greatest Football Game? Design 120 plays, and watch the action from the sidelines or the simulated Goodyear blimp. Or, if crashing bodies appeal to you less than green grass and grace, try The World's Greatest Baseball Game. Epyx gives you the 1984 stats for all the big-league teams. $35 each from Epyx Computer Software, 1043 Kiel Court, Sunnyvale, CA 94089, (408) 745-0700.

Seiko Programmable Watch

Dick Tracy's got nothing on you. Carry 2K of memory on your wrist with the Seiko PC Datagraph RC-1000 multifunction quartz wrist terminal. Hook it up to your home Apple, and select the information to be stored. Complete with connecting cable and Apple software, the PC Datagraph retails for $150 from Hattori America, Consumer Electronics Division, 1330 West Walnut Parkway, Compton, CA 90220, (213) 603-9550.

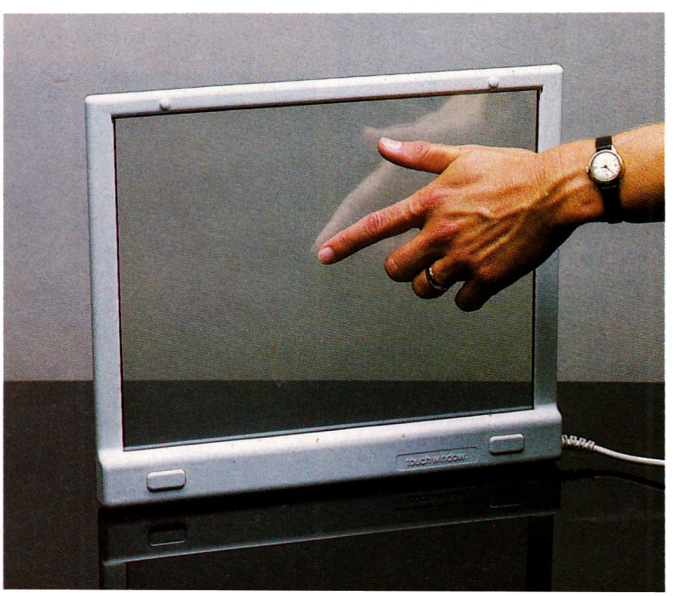


Blazing Paddles

Discover your talent for graphics art with Blazing Paddles, a graphics tool kit with an assortment of animals, trees, buildings, geometric shapes, and musical symbols and instruments. $49.95 from Baudville, 1001 Medical Park Drive S.E., Grand Rapids, MI 49506, (800) 824-8873, or (616) 957-3036 in Michigan.

Touch Window

No more keyboard antics for you. Touch Window converts your Apple to a see-through touch-screen system. The pressure-sensitive surface allows immediate interaction—simply touch the screen with your finger. Turn your screen into an input device. $195 from Personal Touch, 4320 Stevens Creek Boulevard, Suite 290, San Jose, CA 95129, (408) 246-8822.

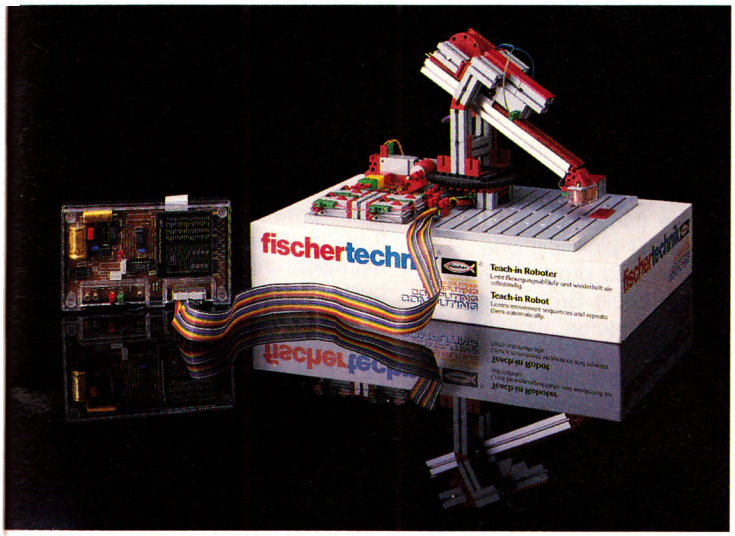


Video Glasses

Is that you squinting in front of the computer monitor? Relieve eye fatigue with a pair of amber-colored eyeglasses designed to filter ultraviolet radiation emitted by video display terminals. Prices start at $39.95 from Fran C Distributors, 3 Yellowbrick Court, Northport, NY 11768, (516) 544-9051.

fischertechnik Robotic Computing Kit

Isaac Asimov would be proud—learn all about robotics with the fischertechnik Robotic Computing Kit. The kit includes everything you need to build your own computer-controlled robot. $199 from fischer America, 175 Route 46 West, Fairfield, NJ 07006, (201) 227-9283.



Winter Games

Let it snow, let it snow. . . . Toast your toes in front of a warm Apple and play Winter Games—a preview of the 1988 Winter Olympics. Ski jumping, ski biathlon, hotdogging, bobsledding, and ice skating are the events in this snowy challenge from the folks who brought you Summer Games. $35 from Epyx Computer Software, 1043 Kiel Court, Sunnyvale, CA 94089, (408) 745-0700.

Wilderness

If Santa's sleigh were to take a dive into the Sierra Nevada mountains, he'd be glad he played Wilderness, a chilling simulation of a survival trek through the hills. Three-dimensional graphics and realistic problems bring Wilderness alive. $50 from Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403, (415) 571-7171.

Patchworks

Computer technology discovers a pastime your grandmother and her grandmother before her enjoyed—quilting. Patchworks software brings computer-aided design to quilting, embroidery, and other needle arts. Patchworks even calculates how much material you'll need to make an actual quilt. $59.95 from Random House Software, 201 East 50th Street, New York, NY 10022, (212) 751-2600.

KoalaPad +

By all means, touch the KoalaPad + to draw "freehand" with your Apple II. The KoalaPad + includes KoalaPad tablet, Koala Painter program, and Graphics Exhibitor software. $125 from Koala Technologies, 3100 Patrick Henry Drive, Santa Clara, CA 95050, (408) 946-4483.

Bank Street Mailer

Bank Street writers struggling with holiday card lists and check mailings, rejoice: Bank Street Mailer, a new mailing-list and letter-writing program, carries on in the easy-but-powerful tradition of Bank Street Writer and Filer. $69.95 from Broderbund, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

Voice Master

Your Apple will be wishing you happy holidays and singing along on Christmas Eve with the Voice Master. The speech synthesizer and voice-recognition software are only the wrapping on this present: The unique Voice Harp module is a digital musical instrument you can play by humming or whistling. The complete hardware and software system sells for $89.95 from Covox, 675-D Conger Street, Eugene, OR 97402, (503) 342-1271.

Computer Quilts

Keep your Apple cozy in comfy blankets in rainbow shades. The washable fabric allows heat to escape, but prevents dust from getting in. You can tuck in your mouse and other peripherals, too. $4.95 to $35.95 from Computer Quilts, P.O. Box 1212, Killeen, TX 76541, (817) 634-6177.

The Black Cauldron

From the silver screen to your computer screen comes The Black Cauldron, an adventure game based on Walt Disney's animated feature film. $39.95 from Sierra On-Line, P.O. Box 485, Coarsegold, CA 93614, (209) 683-6858.

Holiday Extravaganzas

A little luxury goes a long way. . .

The Roommates

There's nothing odd about this couple—The Roommates, a pair of Bose speakers, let your Apple II perform in stereo. $229 from Bose, 78 Turnpike Road, Westboro, MA 01581, (800) 343-6942, or (617) 366-9896 in Massachusetts.

ColorMonitor //e and ColorMonitor //c

Add color to your Apple world with the ColorMonitor //e or ColorMonitor //c—13-inch, 80-column-display, composite monitors. $450 each from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, (408) 996-1010.

Okimate 10 and 20 Personal Color Printers

Paint Christmas red and green with the Okimate 10 and 20, low-cost ribbon-transfer printers. The 10 draws in 50 colors, the 20 in 100, on almost any kind of paper—and the screen-dump software included lets you reproduce anything on your monitor. $208 (10), $258 (parallel 20), $268 (serial 20) from Okidata America, 532 Fellowship Road, Mount Laurel, NJ 08054, (609) 235-2600.

Everything from the Beagle Bros Catalog

For the consummate techie who can't pick just one Beagle Bros product—the entire Beagle Bros collection of 22 items, including the utilities Extra K and DiskQuik, and the game I.O. Silver. $734.45 from Beagle Bros, 3990 Old Town Avenue, Suite 102C, San Diego, CA 92110, (619) 296-6400.

Puma Sneakers

Keep track of every mile with Puma's new computer running sneakers. Puma's high-tech shoes have a built-in electronic device that hooks up to your //e to figure time and distance run, and energy or calories expended. $200 from Puma, 492 Old Connecticut Path, Framingham, MA 01701, (617) 875-0660.

UniDisk 3.5

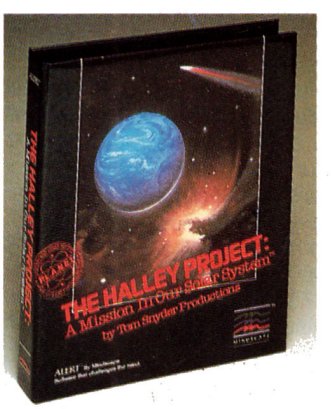
Good things come in small packages. The UniDisk 3.5, a double-sided 3½-inch disk drive, has almost six times the capacity of your old 5¼-inch drive—800K bytes. And, according to Apple, the UniDisk 3.5 functions either as a boot drive or a secondary drive. Approximately $500 from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, (408) 996-1010.

Halley's Comet

Astronomy nuts, or anyone else for that matter, can learn about Halley's Comet—where to look for it, its history, and its position for any date and location, with The Halley Project from Mindscape. If that doesn't sate your comet curiosity, then how about a trip to Australia for better viewing of the famed nighttime apparition? Saga Holidays of Boston, Massachusetts, offers a 26-night land-tour and cruise package around Australia and New Zealand—that should give you plenty of time for comet watching. Rates for the tour range from $3829 to $4209 for December through February. Saga International Holidays is located at 120 Boylston Street, Boston, MA 02116, (800) 762-3413. Screen-bound comet watchers can get The Halley Project for the less celestial price of $49.95 from Mindscape, 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667.

MultiRam //EX and MultiRam //CX

MultiRam X boards are among the first to use the 65816 MPU, a 16-bit processor that can also run all your 8-bit software. They work with Checkmate's MultiRam //e and //c memory-expansion boards. MultiRam //EX, $189.95; //CX, $449.95 (includes 256K of RAM); //c RAMcard upgrade, $149.95, from Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281, (602) 966-5802.



Passport Apple //c Music Software

Carolers and bell ringers can enter the computer age with Passport's complete music-synthesis package for the //c (part number MP-04A). For a mere $1009.65—remember, it's Christmas—the musician on your list gets a Passport MIDI Interface with Tape and Drum/Clock Sync, a MIDI/8 Plus, MIDI/4 Plus, MIDI Player, Polywriter, Leadsheeter, and the Polywriter utilities. From Passport Designs, 625 Miramontes Street #103, Half Moon Bay, CA 94019, (415) 726-0280.

Original IBM PCjr Keyboard

Looking for something a little more stylish than a wooden wedge to prop open your door? How about an original IBM PCjr keyboard? You can let the world know of your interest in computers, while paying homage to those gone by. Get your high-tech doorstop from IBM; call (800) 426-3332 for the product center nearest you.

HX-9 Color Monitor

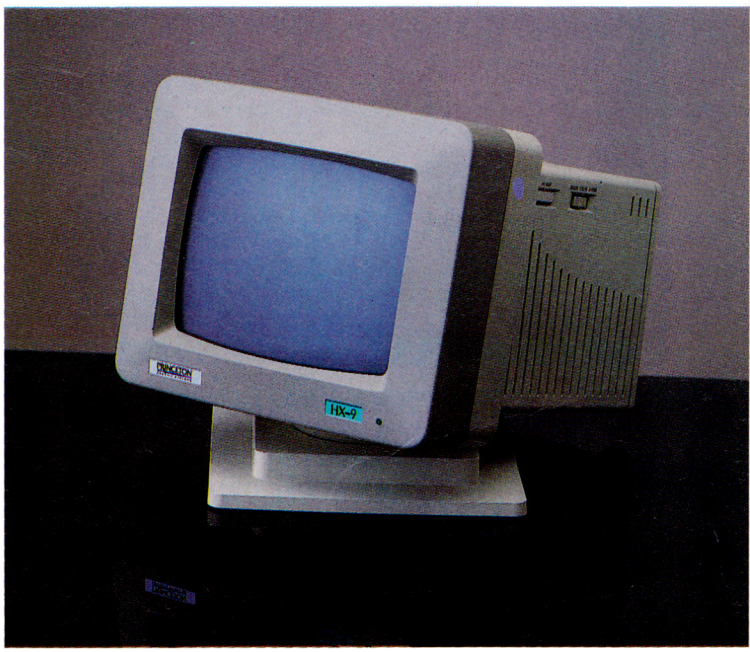
If you're tired of your monochrome monitor, the 9-inch HX-9 color monitor can brighten up your computing. The HX-9 features RGB capability, a black-matrix nonglare screen, and 16 full colors in Apple mode. A green-amber text switch is built in. $650 from Princeton Graphic Systems, 170 Wall Street, Princeton, NJ 08540, (800) 221-1490, (609) 683-1660.

Hayes Smartmodem 2400

Bring your telecommunicating technology up to 2400 baud with the Hayes Smartmodem 2400, and be ready for high-speed information transfer. $899 from Hayes Microcomputer Products, P.O. Box 105203, Atlanta, GA 30348, (404) 441-1617.

TeamMate Hard Disk

It doesn't work with any operating system but ProDOS, and its back-up procedures aren't the best, but the TeamMate 10-megabyte has the best read/write performance of any hard disk available for your Apple. $1695 from Data Technology, Department TM-1A, 2525 Walsh Avenue, Santa Clara, CA 95051, (800) 824-3724.



Cari

Pack up your //c and go—thanks to the Cari Portable Powered Work Station, a rechargeable battery system that lets you hit the road. $249.95 from Discwasher, 1407 North Providence Road, P.O. Box 6021, Columbia, MO 65205, (314) 449-0941.

Imagewriter II

Keep your high-tech image intact within your close computer circle. The Imagewriter II is a 10-inch color printer that comes with a 2K buffer and an expansion slot. Clocked at 250 characters per second in draft mode, Imagewriter II costs around $600 from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014, (408) 996-1010.

Multicore

Give your II a practical enhancement: Multicore, a multifunction memory-expansion card, provides parallel and serial interfaces with a ProDOS-compatible clock/calendar and lithium battery for time- and date-stamping files. $219 for Multicore with no memory, $279 for 64K, $329 for 128K, $399 for 256K, from Quadram Corporation, 1 Quad Way, Norcross, GA 30093, (404) 923-6666.

Rubbermaid Workstation

Do your computing in comfort and style. Rubbermaid's adjustable modular workstation holds your CRT and keyboard in the position that suits you best. Accessories available—shelves, copy holders, tables, and more. Outfit your office for $555 and up, from Rubbermaid Commercial Products, 3124 Valley Avenue, Winchester, VA 22601, (800) 336-7306, (703) 667-8700.

Keep Wishing List...

Fantasies to keep the holiday spirit alive all year long. . . .

Enhanced Applesoft BASIC

Wouldn't you love to have an Applesoft BASIC upgrade that would give you direct control of double-high-resolution graphics, let you use all the memory in your Apple, and fit snugly into ROM? Sure you would—and so would just about everyone else who is currently programming in Applesoft.

Apple Laser Printer

LaserWriter isn't just for the Macintosh anymore. Yes, you can run a LaserWriter with an Apple II, but only via the LaserWriter's serial port. Wouldn't you like to be able to hook up a LaserWriter via the AppleTalk network and take advantage of its graphics language, PostScript? No need to wish too hard about this one—something may be in the wind.

Read/Write Laser Disk Drive

Already tired of the 800K per disk that Apple's new UniDisk 3.5 gives you? Bored with the 10-megabyte Sider? Well, there's hope on the far horizon for all those who feel that current direct-access storage is inadequate. Just keep wishing for the technology that will let your computer read from and write to an optical disk. What would you do with a couple of gigabytes of storage?

32-Bit Apple II

What about a computer based on the Motorola 68020 microprocessor—a true 32-bit MPU? This machine would emulate the Apple II by brute force, translating and executing 6502 instructions as it encountered them. Of course, it would also execute native-mode programs that would blow the doors off the Macintosh, the PC AT, the Amiga, and even the MicroVAX II. Just imagine this Apple under your Christmas tree.

Steve Wozniak Back at Apple

Okay, the MacFanatic is gone, so why don't the big boys make an attempt to woo our favorite computer designer back into the fold? Stevie, come home!

The Truth About inCider

You probably already know that **inCider** is the fastest-growing Apple*-specific magazine on the market today.

What you might not know is that there are nearly 2 million Apple computer owners out there. And, many of them buy their copies of **inCider** at dealerships like yours every month. They might even be buying it from your competitors. . ..

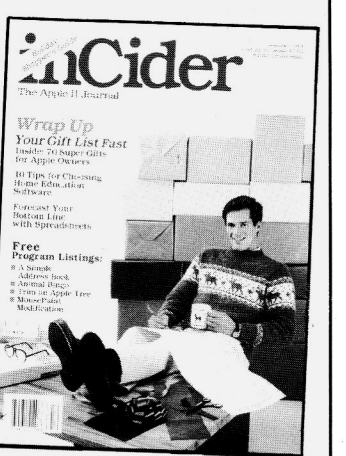
The remarkable success Apple has enjoyed shows no signs of slowing. As a result, **inCider**'s continued growth is assured—and so is yours, as an Apple dealer.

We make it easy for you to sell **inCider**. We give you:

- liberal reader discounts
- four month, full-refund returns
- a toll-free number for customer service
- a colorful poster to spur sales

To place your order, call our Direct Sales Department today at
1-800-343-0728

or write to
inCider
Direct Sales Department
80 Pine Street
Peterborough, NH 03458



*Apple is a registered trademark of Apple Computer Inc.

inCider's Bookshelf

The Skeptical Consumer's Guide to Used Computers (Ten-Speed Press, $9.95) could save you a bundle. Ed Kahn and Charles Seiter have practical advice on what holds up—the //e—and what falls down—the PCjr. Great illustrations.

"The Cracker," Bill Landreth, steps **Out of the Inner Circle** (Microsoft Press, $9.95) to reveal the dark world of teenaged phreaks and pirates who plunder America's data banks. A "hacker's guide to computer security" by one who went straight.

They All Laughed When I Sat Down at the Computer (Simon & Schuster, $16.95) is a light-hearted look at personal computing by *The New York Times*' respected columnist Erik Sanberg-Diment. Witty and wise.

How to Repair and Maintain Your Apple Computer (Chilton Book Company, $12.95) explains how. Gene Williams has the answers to all those questions about poking into your //e or //c. With photos and instructions.

Bruce Hicks and Sylvia Baron teach **//c BASIC Paint** (Wiley Press, $16.95), a solid introduction to graphics for readers fluent in BASIC, and a good start in programming for beginners.

Apple archaeologists and other explorers will want to peruse **The Apple CP/M Book** (Scott, Foresman, $12.95) for a tutorial peek into the operating system's structure, commands, and utilities.

Understanding the Apple //e (Brady Books, $24.95), Apple Clinic columnist Jim Sather's latest. Whatever you wonder about the inner workings of your //e, the answer's probably here.

Back to Basic (Addison-Wesley, $12.95) explores the history, corruption, and future of the pervasive language created by authors John Kemeny and Thomas Kurtz.

PRINCE — Make color prints with your black & white printer

Prince

Color Prints from your black and white printer.

For Apple //+, //e, //c Computers

BAUDVILLE

- Produce up to 80 colorful printouts for greeting cards, announcements, stationery, labels, stickers, t-shirt transfers and much more.
- Contains PRINCE software, 4 color ribbons, a library of art and text styles, and Craft Kit with paper selection, envelopes, and sticker/label stock.
- Edit and print pictures from popular graphics programs including Blazing Paddles®, Dazzle Draw®, Micro Illustrator®, Pixit® and more. Any screen image can be printed including double hi-res.
- For Apple® //+, //e and //c Computers.
- Printers Supported: Epson MX-80, FX-80, RX-80 Imagewriter, DMP, C.Itoh 8510/Prowriter, 8510SC, NEC 8023

SEE YOUR DEALER or for direct orders, enclose $69.95 (plus $3.50 for shipping/handling) and specify printer model.

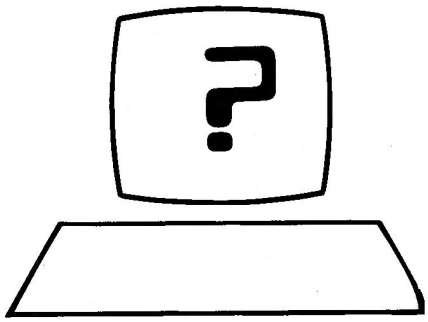
VISA or Mastercard orders, call:
ORDERLINE 800-824-8873
(In Michigan, 616-957-3036)

BAUDVILLE
1001 Medical Park Dr. SE
Grand Rapids, MI 49506

Software and printer trademarks acknowledged.

BACKTALK

'Tis the Season



Don't be a Scrooge. *inCider* wants to help you get into the holiday spirit. Our holiday gift guide on page 46 lists more than 50 items that are bound to please even the most finicky Apple II owner.

But what about you? What have you been hinting around for? A new printer. . .selection of software. . . modem? Maybe you're not the type who expects much, and a set of colored floppy disks would make you ecstatic.

Of course, since it's better to give than to receive, what do you plan to wrap up for your favorite Apple computer fan? We'd like to know. Dial (603) 924-9801 with your modem and answer the survey on our bulletin-board system. After you log on, type POLL after the system command to bring up the survey. You can still participate even if you don't have a modem. Simply complete the following questionnaire and mail it to BackTalk, *inCider*, 80 Pine Street, Peterborough, NH 03458.

Please send your responses—by mail or modem—before December 13, 1985. Results will appear in the February issue.■

1) My holiday wish list would start with:
- a) an Apple //e enhancement kit
- b) a selection of hardware (monitor, disk drives, printer, joystick/mouse)
- c) a software assortment (word processor, games, educational software, graphics package)

2) Considering that a little extravagance goes a long way, I'd like to find _____ under my tree:
- a) peace and good will
- b) 100 shares of Apple stock
- c) an IBM PCjr

3) Sticking to more practical gifts, I'd like someone to give me:
- a) a modem
- b) a letter-quality printer
- c) software

4) I'd give my favorite Apple II owner:
- a) a modem
- b) a RAM card
- c) a word processor

5) As far as practical gifts go, I think the most worthwhile is:
- a) a membership in a local Apple user group
- b) a lifetime supply of floppy disks
- c) a set of Apple II tutorial books

6) If I could give a computer gift to my local school system, I'd donate:
- a) an enhanced Apple //e system
- b) a color monitor
- c) educational software

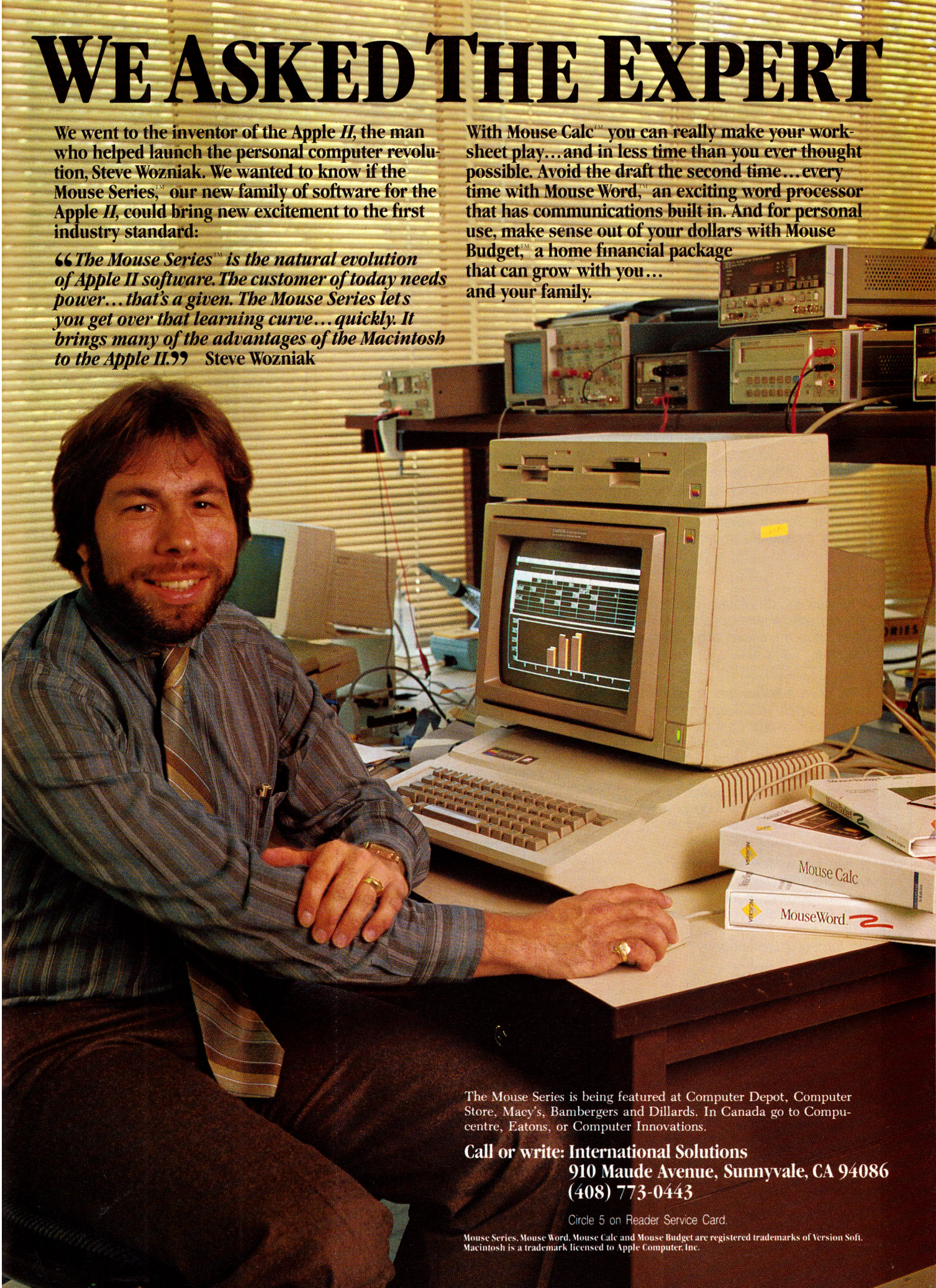
7) If I could have my choice of three computer-related items, and dreaming could make it so, my list would include:

WE ASKED THE EXPERT

We went to the inventor of the Apple *II*, the man who helped launch the personal computer revolution, Steve Wozniak. We wanted to know if the Mouse Series,™ our new family of software for the Apple *II*, could bring new excitement to the first industry standard:

"The Mouse Series™ is the natural evolution of Apple II software. The customer of today needs power... that's a given. The Mouse Series lets you get over that learning curve... quickly. It brings many of the advantages of the Macintosh to the Apple II." Steve Wozniak

With Mouse Calc™ you can really make your worksheet play... and in less time than you ever thought possible. Avoid the draft the second time... every time with Mouse Word,™ an exciting word processor that has communications built in. And for personal use, make sense out of your dollars with Mouse Budget,™ a home financial package that can grow with you... and your family.



The Mouse Series is being featured at Computer Depot, Computer Store, Macy's, Bambergers and Dillards. In Canada go to Compucentre, Eatons, or Computer Innovations.

Call or write: International Solutions
910 Maude Avenue, Sunnyvale, CA 94086
(408) 773-0443

Circle 5 on Reader Service Card.

Mouse Series, Mouse Word, Mouse Calc and Mouse Budget are registered trademarks of Version Soft. Macintosh is a trademark licensed to Apple Computer, Inc.

BACKTALK

Beauty Is in the Eye of the Beholder

We braced ourselves for the results of October's BackTalk (p. 81) when we asked you to scrutinize *inCider*'s new look. It's not every day a magazine elicits criticism from its readers. But then, we respect what you think about editorial content and design.

Response, at first, came from a sentimental faction praying that the new design was a hoax or at least an experiment. Others weren't so tolerant. Many threatened to cancel subscriptions.

Hate Mail

"The new inCider *stinks. Go back to the old way. If you continue, I may have to drop my subscription at renewal time."*

"I've been a subscriber since the beginning when you were chock full of information and programs. You've been getting slicker and slicker since the summer of 1984, and, while I didn't like it, there was enough to keep me subscribing. I guess I'll stay for a while out of some kind of sentimentality, but not if it gets worse."

"I had just written a check for renewal when this issue arrived. I'm now reconsidering. If this is what I'll get for 12 months. . .yuck! [Is there] any hope this is just a phase you're going through? Like puberty?"

"It looks to me you've made a change for change's sake and not really improved anything. Sorry, but I liked the old format better."

"Your 'professional' look doesn't suit you. Your magazine lost a lot of its readability in the change. To be frank, your magazine lacks the pep it used to have. There's no emotion in those stark black-and-white pages that a farsighted person could read if you slammed his face into it."

Good News

But when the final response was tallied, 52 percent said the new *inCider* sports a clean, professional appearance. The reason: 53 percent cited the easy-to-read sans-serif typeface. Considering design changes, 61 percent thought artwork enhanced the articles; 45 percent preferred screen shots in the review section; and 59 percent found the table of contents helpful and attractive.

"The clean lines and titles at the tops of pages look very nice and professional. This in particular gives the magazine a really fresh, sophisticated look."

"The new inCider *is more readable. Art and graphics are okay, but it was always the 'meat' that attracted me, and that hasn't changed."*

"The new inCider *is even better. I didn't think* inCider *could be any better, but you improved it. Amazing!"*

*"*inCider *is more interesting and of better quality than it was before."*

"I find the new inCider *more appealing and easier to read. I especially like the crisp, intense, vibrant, true-color illustrations. Congratulations."*

"You look marvelous!"

Art Director Donna Wohlfarth appreciates reader opinion. But as she says, "It's not over yet. I look forward to reader comments on the design so we can make *inCider* into the book everybody wants."■

ORDERS ONLY

TOLL FREE 1-800-382-2242
IN CANADA:
1-800-843-0074
IN CT: (203) 375-3860
7 DAYS/WK
9AM to 11PM EST

1. WE WILL BEAT ANY COMPARABLE ADVERTISED PRICE BY $1 (See Below).
2. School and corporate purchase orders are welcomed. CALL 1-800-874-1108.
3. Special/rush orders. If something you need is not listed, hard to find, or needed in a hurry, CALL 1-800-874-1108.
4. Order Status. CALL (203) 375-3860.
5. FREQUENT PURCHASER PROGRAM. Effective 10/14/85, any repeat customer who has placed an order after 9/4/85 will automatically receive $1 off any order he or she places with us. Please mention to your operator that you are a repeat customer. We value your continuing business. Send in $1,000 worth of invoices (representing previous purchases) and you will receive a coupon worth 1% off any future purchase. With $5,000 worth of invoices, receive a coupon worth 5% off any future purchase.
6. SOFTWARE RENTAL LIBRARY. For 25% of our price, rent any program for two weeks. Apply your rental fee toward purchase if you choose.
7. No additional charges for credit card orders.
8. Convenient hours. 7 days/week: 9 AM-11 PM EST.
9. FURTHER DISCOUNTS BY MAIL. Circle the items in our ad you want, send the ad in with the coupon below and receive $.50 off each item! Cut out a competitor's ad with a lower price and we will give you $1 off his price (subject to the conditions below).

ORDER EARLY FOR THE HOLIDAYS. IF ORDERING AT THE LAST MINUTE, OUR AIR EXPRESS SERVICE CAN RUSH YOUR SOFTWARE/HARDWARE TO YOU. HAVE A HAPPY AND SAFE HOLIDAYS!

Send coupon and list of items desired to:
DISCOUNT BY MAIL DEPARTMENT
Northeastern Software, 88 Ryders Lane, Stratford, CT 06497

To be eligible for the $.50 per item discount you must:
1. Fill out all items. 2. Send in our ad with the items you desire circled.

Name
Address
(Include Company Name)
City State Zip
Phone No. at above address
Check form of payment
Visa MasterCard C.O.D. Personal Check
Certified Check Money Order
Card No. Exp. Date
9/85

NORTHEASTERN Software

88 Ryders Lane, Stratford, Connecticut 06497

SPECIALS

Appleworks	174.00
Back It Up III	52.00
CIA Files	46.75
Copy II+	19.50
Copy Master II 128K w/Gr. Dump	94.00
EDD III	44.75
Fokker Triplane	35.00
Graphworks	62.00
Jeevz	35.00
Locksmith 5.0	64.00
R. Wagner Mouse Write	72.75
Super Serial Card	104.00
Wildcard II	72.00

ENTERTAINMENT

Spy Hunter or Buck Rogers	26.50
Tapper or Star Trek	26.50
Frogger 3-Deep or Super Zaxxon	21.75
Sorcerer, Suspect or Infidel	26.50
Cutthroats or Zork I	23.50
Zork II or Zork III	25.75
Witness or Seastalker	23.50
Deadline, Suspended, or Starcross	28.50
Planetfall or Enchanter	23.50
Hitchhiker's Guide to the Galaxy	22.50
Murder by the Dozen or Felony	22.00
Ultima III	33.50
Lode Runner or Karateka	21.50
Championship Lode Runner	20.75
Choplifter	20.75
Reforger 88 or Kampfgruppe	35.50
50 Mission Crush or Rails West	23.50
Objective Kursk or Phantasie	23.50
Questron	29.75
Battle for Normandy	23.75
Operation Market Garden	29.75
Imperium Galacticum or Broadsides	23.50
Geopolitique 1990	23.50
Baltic 85 or Gemstone Warrior	20.50
North Atlantic 86	35.00
Germany 1985 or Carrier Force	35.00
War in Russia	47.00
Flight Simulator II	30.75
Night Mission Pinball	21.75
Wizardry I	29.00
Wizardry II	20.75
Wizardry III or Wizardry IV	23.75
Wizprint	14.75
Rendezvous with Rama	23.75
Dragonworld or Shadowkeep	23.75
F-15 Strike Eagle or Solo Flight	20.75
NATO Commander	21.75
Crusade in Europe	24.00
Fahrenheit 451	24.50
Amazon	24.50
Expedition Amazon	20.75
Pole Position or Zaxxon	18.75
The Tracer Sanction or H.E.R.O.	23.75
Pitfall II or Rock N Bolt	23.50
Ghostbusters or Zenii	23.50
Mind Shadow or Space Shuttle	23.50
The Quest or Ring Quest	20.50
Coveted Mirror	20.75
Xyphus or Transylvania	20.50
Frogger or BC's Quest for Tires	20.75
King's Quest	29.00
King's Quest II	29.00
Micro League Baseball	23.75
Where...Is Carmen San Diego?	23.75
Summer Games I or II	23.75
Ken Uston's Blackjack	41.00
Castle Wolfenstein	19.75
Beyond Castle Wolfenstein	19.50
Millionaire, Baron, or Tycoon	23.75
Forbidden Quest	23.75
Spitfire Simulator	24.75
AirSim III	25.75
Bruce Lee or Conan	22.50
Sargon III	29.00
Death in the Caribbean	20.75
Miner 2049er or The Heist	23.75
How About A Nice Game of Chess?	20.75
Mask of the Sun	26.75
Adventure Construction Set	30.75
Europe Ablaze	30.75
Carriers at War	30.75
Bard's Tale or Reach for The Stars	31.00
Hard Hat Mack	12.75
Pinball Construction Set	22.25
Music Construction Set	24.75
The Standing Stone	12.75
One-On-One	25.25
Archon	22.25
Archon II or Skyfox	25.25
Seven Cities of Gold	25.25
Murder On The Zinderneuf	22.25
Sundog	30.75
Gato	22.75

PRINTERS

APPLE

Imagewriter II (NEW!)	469.00
Imagewriter 10", UNDER	415.00
Imagewriter 15", UNDER	479.00

BROTHER

HR-15 XL	354.00
HR-35	684.00

C. ITOH

8510AP	288.00
8510AP Plus	318.00
1550AP	434.00
1550AP Plus	454.00

DYNAX

DX-15	375.00

EPSON

Spectrum LX-80	209.00
Spectrum LX-90	CALL
JX-80	CALL
FX-85 or FX-185	CALL
LQ-1500	CALL
DX-10 or DX-20	CALL

JUKI

6100***	349.00

MANNESMAN TALLY

MT-85	348.00
MT-86	418.00

NEC INFO SYSTEMS

N2030	645.00
N3530	969.00

OKIDATA

182	214.00
192	348.00
192 Imagewriter	378.00
193	478.00

PANASONIC

KXP 1091***	247.00
KXP 1092	369.00
KXP 1093	439.00
KXP 3151	415.00

QUME

Qume Printer Line	CALL

SILVER REED

EXP 400P	214.00
EXP 500P	244.00
EXP 550P	395.00
EXP 770P	689.00

STAR MICRONICS

SG 10	219.00
SG 10C	258.00
SG 15	378.00
SR 10	487.00
SR 15	587.00
SD 10	338.00
SD 15	454.00

TOSHIBA

P1340	529.00
P351	1065.00

ACCESSORIES/CARDS/ HOME SOFTWARE

Accelerator IIE (TITAN)	206.00
Apple Mechanic	16.50
Apple Mouse IIc	75.00
Apple Mouse IIe	105.00
Applesoft Compiler	105.00
Appleworks Modifier 64K	38.00
Appleworks Modifier 128K	58.00
Applied Eng. OK to 1MB	CALL
Applied Eng. System Clock	64.00
Applied Eng. Viewmaster	103.00
Applied Eng. Z-80 Plus	104.00
Apricorn 16K RAM Card	67.00
Apricorn 64K Extend It	88.00
ASCII Pro	76.00
ASCII Multi I/O	163.00
Bag of Tricks (QUALITY)	24.75
Bank St. Filer, Speller, or Writer	40.00
Beagle Basic	19.25
Beagle Graphics	31.50
Blazing Paddles	27.00
Buffered Grappler	133.00
Business Card (STREET ELEC.)	CALL
Checkmate Multiview 80/160	217.00
Compuserve Starter Kit	18.00
Cricket IIc	113.00
Crossword Magic	30.00
Curtis Surge Protectors, From	28.00
Cut & Paste	23.50
D-Code	22.25
Dazzle Draw	35.75
Digital Paintbrush System	174.00
Disk Quick	16.25
Dollars & Sense	57.00
Dollars & Sense IIC	68.00
Doss Boss	13.50
Double Take	19.25
Echo II Plus	92.75
Extend 80 (CARIBBEAN)	78.00
Extra K	22.25
Fat Cat	19.75
Financial Cookbook	31.75
Fingerprint Plus (THIRDWARE)	97.75
Flex Text	16.50
Flip N File 50	18.75
Font Paks 1-11 (EACH)	11.25
Fontrix 1.5	54.50
Forecast	36.00
Frame Up	16.50
GPLE	26.70
Gibson Light Pen	146.00
Graphics Library 1 or 2	14.95
Graphics Magician, The	35.25
Grappler Plus	73.75
Hayes Mach II	26.75
Hayes Mach III	32.75
Hayes Paddles	CALL
Head Cleaning Kit	20.00
I/O Silver	16.75
Keytronics Keyboards	CALL
Koala Pad	71.00
Kraft Joystick	26.00
Lazerware Lisa V2.6	53.50
MCT Speed Demon	159.00
Merlin	35.75
Merlin Combo	63.75
Merlin Pro	56.75
Micro Cookbook II/IIE	22.25
Mockingboard A or B	72.75
Mockingboard C	123.00
Mockingboard D	132.00
Money Street	74.00
Muppet Learning Keys	42.00
Neptune 80 Col. 64K Card	183.00
Net Worth	47.00
New Complete Graphics System	46.00
Nice Print	122.00
Pixit	28.75
Premium Softcard IIe	255.00
Print It (TEXTPRINT)	128.00
Print Shop	27.40
Pro Byter	19.25
Proto Doss	16.25
Quadram Multi-Core Board	CALL
Quadram E-Ram 80	98.00
Saturn 128K Ramcard	174.00
SeriAll Interface Card	103.00
Sideways	33.00
Silicon Salad	13.50
Softcard II (SOFTRONICS)	123.00
System Saver (KENSINGTON)	60.00
Take One	34.00
TG Selectaport	24.75
Thunderclock Plus	106.00
Time Is Money (TURNING POINT)	50.75
Time Trax IIE or IIC	CALL
Trackhouse Keypads	CALL
Triple Dump	21.50
Turbo Pascal	38.50
Turbo Toolbox	32.50
Turbo Tutor	20.75
Type Faces	10.95
Typing Tutor II	14.90
Typing Tutor III	29.75
Ultraterm w/SS Inv.	184.00
Utility City	16.25
Video 7 RGB Interface IIE	CALL
Video 7 RGB Interface IIC	94.00
Visible 6502	31.75
Zoom Graphics	30.50

MONITORS

AMDEK

Color 300***	209.00
Color 500	315.00
Color 600	390.00
Video 300A Amber***	122.00
Video 300G Green***	115.00
DVM III	129.00

PANASONIC

TR 120 Green	114.00
TR 120 Amber	119.00
DTS 101—10" Color	177.00
DTM 140—14" RGB Color	393.00

PRINCETON

HX-12	444.00
RGB Interface	147.00

TAXAN

Green (Hi-Res)	CALL
Amber (Hi-Res)	CALL
220 13" Composite w/audio	CALL
420 RGB Color	CALL
410-64 RGB-2 Interface	CALL

TEKNIKA

MJ-22 RGM Color Monitor	315.00

BLANK MEDIA

Elephant SS/DD	12.00
Elephant DS/DD	17.00
Verbatim SS/DD	15.00
Verbatim DS/DD	20.00
Memorex SS/DD	14.50
BASF SS/DD	13.50
Maxell SS/DD	15.00

HARCOURT BRACE JOVANOVICH

Harcourt SAT	46.00
Harcourt GRE or ACT	53.00

GROLIER

Science Island or Treasure Hunter	24.00
Easy Graph or Friendly Filer	24.00

HAYDEN

Word Challenge	12.00

LEARNING COMPANY

Rocky's Boots or Robot Odyssey	28.00
Number Stumper or Reader Rabbit	23.75
Magic Spells or Word Spinner	20.75
Bumble Games or Bumble Plot	23.75
Gertrude's Puzzle or Secrets	26.25

MAGNUM

Super Speed Reading	30.00

MECC

Elementary Series (EACH)	29.00
Math or Health Series (EACH)	29.00

MILLIKEN

Math Sequences (EACH)	21.00
Number Chase or Pop R' Spell	24.00

PROGRAM DESIGN

The New Step By Step	52.00
Step By Step II or III	52.00

SCARBOROUGH SYSTEMS

Build A Book About You	23.75
Boston Computer Diet	46.00
Mastertype's Writing Wizard	46.00
Mastertype's Filer	23.75
Mastertype's New & Improved	23.75
Run for the Money or Songwriter	23.75

SCHOLASTIC WIZWARE

Fact and Fiction Toolkit IIC	23.75
Microzine 1-8 (EACH)	23.75
Story Tree or Story Maker	23.75
Turtle Tracks or Agent USA	23.75
Operation Frog or Logic Builders	23.75
Logo Robot or Kids At Work	15.00

SPINNAKER SOFTWARE

Fraction Fever or Face Maker	15.00
File and Report or Spreadsheet	35.75
Snooper Troops 1 or 2	19.75
Story Machine or Grandma's House	15.00
Kindercomp or Kids on Keys	15.00
Word Processor	35.00
Alphabet Zoo or Kidwriter	18.00
In Search Of	20.00

SPRINGBOARD

Early Games or Piece of Cake	20.50
Make A Match or Fraction Factory	18.00
The Newsroom	29.00
Clip Art Effects for Newsroom	19.00

SUNBURST

Challenge Math or The Factory	29.75
Teaser by Tobbs	29.75
The Incredible Laboratory	29.75

TERRAPIN

Terrapin Logo	55.00
Terrapin Logo 10 Pack	178.00

TIMEWORKS

Evelyn Wood Dynamic Reader	41.75

WEEKLY READER

Sticky Bear Series, (EACH)	23.75

EDUCATIONAL

APPLE

Logo II	77.00

BARRONS

Computer SAT or GMAT	52.00

CBS

Adventure Master	26.50
Mastering the SAT	58.00
Forecast or T-Rex	29.50

DAVIDSON AND ASSOCIATES

Speed Reader II	40.50
Word Attack, Mathblaster, or Spellit	28.50
All Davidson Data Disks	11.95

DESIGNWARE

Spellcopter or Spellakazam	24.00
States & Traits or European Nations	26.00
Body Transparent or Mission Algebra	26.00
Remember	45.00

DLM

Alien Addition or Alligator Mix	20.00
Meteor Mult. or Minus Mission	20.00
Demolition Division or Dragon Mix	20.00
Spelling Wiz or Word Invasion	20.00

EDU-WARE/PEACHTREE

Compu Read	16.75
Compu Math	28.00
SAT or PSAT Word Attack Skills	16.95
Spelling Bee & Reading Primer	22.75
Algebra 1, 2, 3, or 4	22.00
Algebra 5 & 6	27.00
Writing Skills 1, 2, 3, 4, or 5	23.00
Hands on BASIC	30.00
Introduction to Counting	23.00
Fractions or Decimals	23.00

BUSINESS

ADVANCED LOGIC SYSTEMS

The Handlers Package	97.00
List or Word Handler	44.75

APPLE

Apple Writer IIE	112.00
Apple Access	54.75
Quickfile	69.00

APPLIED SOFTWARE TECHNOLOGY

Versaform	44.00

ARTSCI

Magic Office Systems	126.00
Magic Calc 3.3	57.00
Magic Window II	77.00

ASHTON TATE

DBase II	251.00

BPI

Gen. Acctg., AR, AP, GL, PAY	217.00
Time Accounting	203.00

BLYTH SOFTWARE

Omnis III	227.00

CONTINENTAL SOFTWARE

FCM/FL	57.00
Home Accountant or Tax Advantage	40.00
GL, AR, AP, PAY	133.00

DOW JONES SOFTWARE

Investor's Workshop	87.00
Market Analyzer or Microscope	198.00
Mkt. Mgr. or Spreadsheet Link	147.00
Membership Kit	18.00

HAYDEN SOFTWARE

The Writer	27.00

HOWARD SOFTWARE SERVICES

Real Estate Analyzer II	134.00

HUMAN EDGE

Communication or Sales Edge	88.75
Mgt. or Negotiation Edge	88.75
Mind Prober	26.00

KENSINGTON

Format II Enhanced	87.75

LIVING VIDEOTEXT

Think Tank II/IIE	77.00

MEGAHAUS

Megafinder	89.75
Megaworks	74.50

MICROPRO

Wordstar	168.00
Wordstar Professional	227.00

MICROSOFT

Multiplan	54.75

MICROSTUF

Crosstalk	103.00

PEACHTREE

Back To Basics Accounting	99.00

PRACTICORP

Practicalc	28.00

PRECISION SOFTWARE

Superbase	54.00

QUARK

Word Juggler w/Lexicheck	112.00

SENSIBLE SOFTWARE

Bookends or Sensible Speller	67.00
The Graphics Department	65.00
Report Card	33.00

SIERRA-ON-LINE

The General Manager II	127.00
Homeword	41.00
Homeword Speller	30.00
Screenwriter IIE	73.00

SORCIM

Supercalc 3A	101.00

SOFTWARE PUBLISHING

PFS: Best Sellers	142.00
PFS: Access or Proof	44.00
PFS: File or Graph	69.00
PFS: Report or Write	69.00

STONEWARE

DB Master 4 Plus	167.00
DB Master Hard Disk	235.00
DB Master Business Writer	87.00
DB Bus. Pack or Master Bus. Team	187.00

VISICORP

Flashcalc	57.00

DISK DRIVES

APPLE

Disk II Drive	275.00
Duo Disk w/Acc. Kit	565.00
IIC Add-On	255.00

MICRO SCI

A2 143K	168.00
Slimline IIE	178.00
Slimline IIC	168.00
Controller Card	53.00

QUARK

QC-10 Hard Disk, UNDER	999.00
QC-20 Hard Disk, UNDER	1379.00

MODEMS

212 Apple Cat	355.00
Apple Cat II	188.00
Apple Modem 1200 Baud w/acc. kit	349.00
Apple Modem 300 Baud w/acc. kit	157.00
Hayes Micromodem IIE w/SC1	128.00
Hayes Smartmodem 1200	363.00
Popcom X-100 Modem	259.00
Prometheus 1200 External	295.00
Prometheus Internal IIE/II+	279.00
Zoom Modem IIE	114.00

***TOP RATED IN A LEADING CONSUMER MAGAZINE

WE WILL BEAT ANY COMPARABLE ADVERTISED PRICE BY $1 (See Below)
SCHOOL AND CORPORATE PURCHASE ORDERS ACCEPTED; CALL 1-800-874-1108

Personal and company checks allow 3 weeks to clear. For faster delivery, send cashier's check, certified check, or money order. Shipping—Software ($3.00 minimum). Shipping—Hardware (please call 203-375-3860). COD—Add an additional $2.00. Alaska, Hawaii, Canada, PO, APO, and FPO $5.00 minimum. Foreign orders—$15.00 minimum and 15% of all orders over $100. Mastercard and Visa (please include card no. and expiration date). Connecticut residents add 7.5% sales tax. Prices subject to change without notice. All returns must have a return authorization number. Call 203-375-3860 to obtain one before returning goods for replacement. Defective merchandise replaced with same item only. We do not guarantee compatibility. All sales are final.

"Comparable advertised price" does not include typographical errors on the part of other vendors or prices that do not reflect higher shipping costs, credit card charges, or membership fees. The $1 off offer only applies to items where Northeastern's price is not already the lowest. Final judgement remains with the manager on duty.

Circle 110 on Reader Service Card.

ANNOUNCING THE FAMILY SOFTWARE SPECTACULAR.™

BUY 3, GET 1 FREE.

CHOOSE FROM OVER 50 LEADING TITLES.

What do you call an offer that brings together, for the first time ever, five leading brands of home software?

The Family Software Spectacular!

And it's your opportunity to choose a *free* software program from the best titles on the market today. All you have to do is buy any combination of three titles from any participating brands during this special offer period. And we'll send you another one of your choice – *free!*

It's a one-of-a-kind value your family shouldn't miss.

FISHER-PRICE.® A NAME YOU CAN TRUST.

For years Fisher-Price has been known for helping children develop skills as they play. With Fisher-Price™ Learning Software, your child can develop skills in five key areas: math, language, creativity, basic learning and computer literacy.

Your child will love developing and testing language skills with the help of PETER RABBIT READING, a program that uses voice to teach sound and letter recognition in words.

WINDHAM CLASSICS.™ CLASSIC NOVELS COME TO LIFE.

Pick up Windham Classics, graphic interactive fiction based on some of the greatest adventures of all time.

They're great for kids, yet fun for all ages.

Enjoy "THE WIZARD OF OZ.™" You are Dorothy, and each of your decisions determines your adventure. There's more than one adventure to be had as you meet old friends and new in the land of Oz.

WORK BETTER WITH BETTER WORKING.™

Constantly erasing and retyping? Unsure of your spelling? WORD PROCESSOR WITH SPELLCHECKER is exactly what you need. This full featured word processor includes the 50,000 word AMERICAN HERITAGE DICTIONARY™ spellchecker which detects over 99% of misspelled words.

The full line also includes FILE & REPORT and SPREADSHEET – titles that represent the best values on the market today.

SPINNAKER.® THE LEADER IN FAMILY LEARNING SOFTWARE.

From pre-school counting to high-school compositions, Spinnaker offers the high quality educational programs you have come to expect. For example, there's the HOMEWORK HELPER™ series which provides step-by-step methods for improving writing and math skills and helps kids tackle otherwise troublesome school assignments.

TELARIUM.™ INTERACTIVE FICTION AT ITS BEST.

Here's graphic interactive fiction by famous writers of science fiction, fantasy, and mystery like Ray Bradbury, Arthur C. Clarke and Erle Stanley Gardner. Each story unfolds with you in the center of the action – and completely in control. In PERRY MASON: THE CASE OF THE MANDARIN MURDER,™ you are the world famous criminal lawyer. Challenge the evidence. Cross-examine the witness. Only you can prove your client's innocence. And time is running out.

A SOFTWARE OFFER FOR ALL AGES.

Any software offer including something for everyone in the family is certainly fantastic. But combine that with a free product offer and what you have is something spectacular. Look for the specially marked boxes of The Family Software Spectacular at your retailer.

The Family Software Spectacular™

TURN PAGE FOR MORE INFORMATION ON THE FAMILY SOFTWARE SPECTACULAR. →

© 1985 SSC., One Kendall Square, Cambridge, MA 02139. All rights reserved. Titles available on most popular home computers. Spelling Software developed by Houghton Mifflin Company, publishers of the *American Heritage Dictionary*.
THE FAMILY SOFTWARE SPECTACULAR is a trademark of Spinnaker Software Corp. SPINNAKER is a registered trademark of Spinnaker Software Corp. FISHER-PRICE is a trademark of The Quaker Oats Company and is used under license. WINDHAM CLASSICS is a trademark of Windham Classics Corp. TELARIUM is a trademark of Telarium Corp. BETTER WORKING is a trademark of Spinnaker Software Corp.

HERE'S HOW YOUR FAMILY CAN PARTICIPATE IN

The Family Software Spectacular™

REMEMBER, TO RECEIVE A FREE PRODUCT YOU MUST PURCHASE ANY THREE TITLES FROM THE PARTICIPATING BRANDS (IN ANY COMBINATION) AND MAIL YOUR ENTRY NO LATER THAN JANUARY 31, 1987.

1. Start by saving the receipt(s) from your software program purchases. (It is not necessary for software purchases to appear on one receipt. Photocopies of the receipt(s) are accepted. Receipts must be dated BETWEEN JULY 1, 1985, AND JANUARY 31, 1987.)
2. Cut the proof-of-purchase tab from each of the three user manuals that come with the programs. (Photocopies **not** accepted.)
3. Attach the purchase receipt(s) and the three original proof-of-purchase tabs to one separate sheet of paper.
4. Fill in the form below and place the completed form in an envelope with:
   a. A sheet of paper with three original proof-of-purchase tabs and your purchase receipt(s).
   b. A check or money order for $3.50 to cover postage and handling. (Canada residents please send $5.00 for postage and handling.)

Make check payable to THE FAMILY SOFTWARE SPECTACULAR and mail envelope to:
THE FAMILY SOFTWARE SPECTACULAR
P.O. Box 1327, Cambridge, MA 02238

ORDER FORM

To receive your free program, this form must be filled out completely. Please print.

Free Product Chosen:

Title/Brand _____

Computer/Model _____

MAKE SURE THE PRODUCT YOU CHOOSE IS AVAILABLE ON THE COMPUTER SYSTEM YOU HAVE SELECTED.

Name _____

Phone (___) _____

Address _____

City _____ State ____ Zip _____

TITLES PURCHASED

1. _____
2. _____
3. _____

BRANDS	DATE OF PURCHASE
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

Allow 6-8 weeks for delivery of your free software program. Note: All receipts and envelope postmark must be dated prior to January 31, 1987. Offer good in the US and Canada only. Void where taxed, restricted or prohibited by law.

ALABAMA
Hytek Computers
Florence, AL

ARIZONA
Collegian Computer Book and Software Stores, Inc.
Phoenix, AZ
Software City
Tucson, AZ

ARKANSAS
Arkansoft
Harrison, AR

CALIFORNIA
R.W. Christ
Campbell, CA
Softwaire Centre
Concord, CA
Computer Center of Hayward
Hayward, CA
Software Etc.
Novato, CA
Software Central
Pasadena, CA
Brown Knows Computing
Redlands, CA
Software Service Center
Riverside, CA
Computerland
San Bernardino, CA
Access to Software
San Francisco, CA
Computers and Beyond
San Francisco, CA
Software Galeria of San Francisco
San Francisco, CA
Software Galeria
Santa Rosa, CA
The Computer Room
Thousand Oaks, CA

COLORADO
Computerland of North Denver
Arvada, CO
Computer City
Broomfield, CO
Renaissance Computerware
Colorado Springs, CO
Micro Computer World
Greeley, CO
Computerland of Columbine
Littleton, CO
Software Center
Littleton, CO

CONNECTICUT
Bright Ideas Computer Center
Guilford, CT
The Personal Computer Center
Norwich, CT
Small Computer Service Center
Westport, CT

DISTRICT OF COLUMBIA
The Program Store
Federal Center Plaza
Washington, DC

FLORIDA
The Program Store
Clearwater, FL
Computers Etc.
Lakeland, FL
Nibbits Software Centers
North Miami Beach, FL
The Program Store
Pinellas, FL
Modern Computing
Rockledge, FL
Education Computers Etc.
Tallahassee, FL
Discount Software
West Palm Beach, FL

HAWAII
Software Plus
Honolulu, HI

IDAHO
Software City
Idaho Falls, ID

ILLINOIS
Software City
Arlington Heights, IL
Computers Plus
Chicago, IL
Aardvark Computer Software Specialists
Chicago Heights, IL
Computer Tree
De Kalb, IL
Software Or Systems
Fairview Heights, IL
Save on Software
Lombard, IL
Centram Distributors
Mokena, IL
The Software Center
Urbana, IL

INDIANA
Micro Computer Systems
Columbus, IN

KANSAS
Team Electronics
Garden City, KS
Softwaire Centre International
Leawood, KS

KENTUCKY
Perrys Computer
Utica, KY

LOUISIANA
Softwaire Centre
Metairie, LA
Software Mart, Inc.
Metairie, LA

MAINE
Pierre's of Exchange St.
Portland, ME

MARYLAND
Computer Learning Systems
Frostburg, MD
The Program Store
White Flint Mall
Kensington, MD
Software City
Rockville, MD

MASSACHUSETTS
General Computer Store
Hamilton Plaza West
Framingham, MA
Computer Systems and Software
Leominster, MA
Computer Marketplace
Tewksbury, MA
The Bit Bucket Computer Store
West Newton, MA
The Whiz Stores, Inc.
Westboro, MA

MICHIGAN
Computer Center
Birmingham, MI
Computer Center
Farmington Hills, MI
Computer Center
Garden City, MI
Software Carousel
Grand Rapids, MI
Computers Today
Holland, MI
Strom Computer
Plymouth, MI
Micro Station
Southfield, MI
Software City
Southfield, MI
Command Computer Systems
Warren, MI
Rite Way Computers
Warren, MI

MINNESOTA
Computer Exercise World
Minneapolis, MN

MISSOURI
Database Systems
Springfield, MO

NEBRASKA
C.B.M. Computer
Omaha, NE

NEVADA
Software City
Las Vegas, NV
Computer Menu
Reno, NV

NEW HAMPSHIRE
Computer Mart of New Hampshire
Amherst, NH
Computer Mart of New Hampshire
Manchester, NH
Computer Mart of New Hampshire
Nashua, NH
Computer Town
Nashua, NH
Computer Town
Salem, NH

NEW JERSEY
Software City
Bergenfield, NJ
Software City
Cross County Plaza
Cherry Hill, NJ
Wolsten Inc.
East Orange, NJ
American Way Outlet Mall
Fairfield, NJ
Family Computer Center
Fairfield, NJ
Computer Ark
Northfield, NJ
Computerland Northfield
Northfield, NJ
Software City
Ridgefield, NJ
Computer Ark
Rio Grande, NJ
Computerland
Somerville, NJ
Family Computer Center
South Orange, NJ
Computer Emporium
Sparta, NJ
Software City
Teaneck, NJ

NEW MEXICO
Page One Software
Albuquerque, NM

NEW YORK
Home Software
Albany, NY
Sysut Computers
Brooklyn, NY
Computer Systems
Depew, NY
Ray Supply Inc.
Glens Falls, NY
Software Seller
Harrison, NY
Camel Computer Systems
Lindenhurst, NY
C.C.C. Computer Center
New Rochelle, NY
Adirondack Computer Supply
Plattsburgh, NY
Ray Supply Inc.
Plattsburgh, NY
Computer Innovations
Smithtown, NY
Computer Solutions
Syracuse, NY
Computer Factory Outlet
Tonawanda, NY
Software City
Tonawanda, NY
Computer Factory Outlet
Southgate Plaza
West Seneca, NY

NORTH CAROLINA
Computer Alternatives Systems
Ashville, NC
Software City
Fayetteville, NC

OHIO
Wyse Book and Office Supplies
Archbold, OH
Software City
Dayton, OH
Software Shuttle
Dayton, OH
Software Centre International
North Olmsted, OH
The Disk Drive
Toledo, OH
Software City
Youngstown, OH
A.D.S. Systems
Zanesville, OH

OKLAHOMA
Video Comp
Lawton, OK
Computer Software Center
Oklahoma City, OK
Software City
Tulsa, OK

OREGON
Software Station
Beaverton, OR
Cherry Computers
The Dalles, OR

PENNSYLVANIA
Software City
Bethel Park, PA
Eastcoast Software
Hershey, PA
Software Unlimited
Levittown, PA
Software Hut
Philadelphia, PA
Pittsburgh Computer Store
Pittsburgh, PA
Pittsburgh Computer Store
Pleasant Hills, PA
Software Galeria
Wayne, PA

TENNESSEE
Stewart Software Co.
Memphis, TN

TEXAS
Computer Stop
Abilene, TX
Impulse Computer
Bay City, TX
Computer Country
Loehman's Plaza
Houston, TX
C.R. Software
Mesquite, TX
Software Supply
Missouri City, TX
Action Business Systems
Temple, TX
Software Ink
Wichita Falls, TX

UTAH
Home Computer Goods
Sandy, UT

VERMONT
Ray Supply Inc.
South Burlington, VT

VIRGINIA
Family Computer Center
Fairfax, VA
Software City
8026 AW Broad St.
Richmond, VA
Software City
9944 Mindlothian
Richmond, VA
Software Plus, Inc.
Richmond, VA
Diskovery
Seven Corners, VA
Software City
Virginia Beach, VA

WASHINGTON
Software City
Bellevue, WA
Apple Valley Computer
East Wenatchee, WA
University Bookstore
Seattle, WA

WISCONSIN
C.B.M. Computer Center
Madison, WI

From Origin, source of the classic, award-winning Ultima™ series, comes

AUTODUEL

A futuristic, fast-paced strategy role-playing game by Lord British and Chuckles. Based on the award-winning Car Wars® board game by Steve Jackson.

Available on Apple®

Drive the freeways of the future where the right of way goes to the biggest gun. Somewhere within the 16 cities and outlaw-infested highways are the clues you will need to complete the ultimate mission.

Step into the arena on Amateur Night and earn the right to custom-build your combat vehicles.

The AADA will offer you courier missions. The FBI and the underworld will vie for favors. But watch out! To survive you'll need road experience, the ability to decipher clues, gambling skills, money, a super car—even a clone.

The final gauntlet will test your tactical skills and hair trigger reactions to the limit. But with triumph comes honor, and entry into the elite circle of AutoDuellists. The challenge of AutoDuel® awaits you. Are you ready?

ORIGIN SYSTEMS INC.

340 HARVEY ROAD, MANCHESTER, NH 03103 (603) 644-3360

ULTIMA™ III sends you on an incredible fantasy role-playing journey through monster-plagued Sosaria in search of the elusive Exodus.

ULTIMA™ IV is the long-awaited sequel to Ultima™ III. The Quest of the Avatar is a quest to the final frontier—the self.

MOEBIUS™ takes you through the elemental planes of a colorful Oriental world of fantasy and adventure in search of the Orb of Celestial Harmony.

OGRE® is a strategy game fought on the nuclear battlefield of tomorrow as an inhuman juggernaut Cybertank battles conventional forces.

Ultima and Lord British are trademarks of Richard Garriott. Moebius is a trademark of Greg Malone. Ogre and AutoDuel are registered trademarks of Steve Jackson Games, Inc. Car Wars is a registered trademark of Texas Instruments. Apple is a trademark of Apple Computer Inc.

Authors wanted. Call us today.

Circle 42 on Reader Service Card.

Are you prepared for tomorrow?

inCider knows that your world of computing is as ever-changing as the lifestyles of the '80s. What's "in" today may be "out" tomorrow. And if you're an Apple II* user, not being ready for tomorrow's changes and challenges can mean less productivity and efficiency.

That's why an *inCider* subscription can be the best investment you make for all your tomorrows. The "Apple II Journal" will keep you informed about every current event, as well as ideas that are still on the drawing board.

Stay On Top Of The Trends

And to know what's hot and what's not, you need to **Ask *inCider***—the popular monthly feature that answers your questions about the latest software and the newest programming ideas.

Hardware? In **Apple Clinic**, you'll learn what works best for other Apple users, plus you'll discover some very economical maintenance and repair hints.

Then, take a look at **Applesoft Adviser**. In no time, you'll become a natural with BASIC so that you can be a better and more creative programmer.

And that's just the beginning of what's in every *inCider* every month.

The Progressive "Apple II Journal"

inCider is today's Apple II magazine dedicated to meeting the challenges you'll face tomorrow. Even our new look sports a cleaner, more appealing design for easier reading and reference!

Subscribe now and you'll get 12 issues of *inCider* for just $24.97—a **30% savings** off the cover price! To order, just return the coupon, or call **1-800-258-5473.** (In NH, call 1-924-9471.)

* Apple II is a registered trademark of Apple Computer, Inc.

Yes. **I want to be a well-informed Apple II user!** Please send me 12 issues of inCider for $24.97. I'll save 30% off the newsstand price.

☐ Payment enclosed ☐ Bill me

Name

Address

City State Zip

Canada and Mexico $27.97, 1 year only, US funds drawn on US bank. Foreign surface $44.97, 1 year only, US funds drawn on US bank. Foreign airmail, please inquire. Please allow 6–8 weeks for delivery.

inCider, P.O. Box 911, Farmingdale, NY 11737 35DB5

inCider

Showing you the future that's taking shape today.

APPLESOFT ADVISER

Trivial Trivia: Part 2

by Dan Bishop

Trivia addicts, unite! Get out your November *inCider* and follow along in the Trivial Trivia **Program listing** (p. 54) while I take a detailed look at the code. Designing your own trivia game has got to be the most enjoyable way you'll ever find to learn more about random-access disk files.

The Trivial Trivia program is composed of several rather short subroutines (most of them less than 20 lines long) that are tied together through a main program sequence (lines 5–75), a master menu (lines 1000–1090), and one sub-menu (lines 2000–2105). **Figure 1** shows the organizational chart for these subroutines. I identified and sketched into the chart more than half of these modules before I wrote even one line of code. I added the other modules as I needed them.

Data Structures

One of the initial decisions you must make when writing any program is how you will represent the data you use in the program. Whenever you deal with several variables that stand for different values for the same item, such as scores for several players, you should consider using an array representation for your data. For Trivial Trivia, I chose to use five arrays; line 100 dimensions them.

Two of these are simple, linear arrays. NM$(i) represents the names of the players. Q$(i) stands for the lines of data that make up a trivia question. Three lines, Q$(1)–Q$(3), take care of the question itself, while five lines, Q$(4)–Q$(8), handle the five multiple-choice answers the game presents with the question.

I originally envisioned only four data files to represent four categories of questions. Further consideration brought to light the fact that the individual responsible for typing trivia into the data files would be answering his or her own questions.

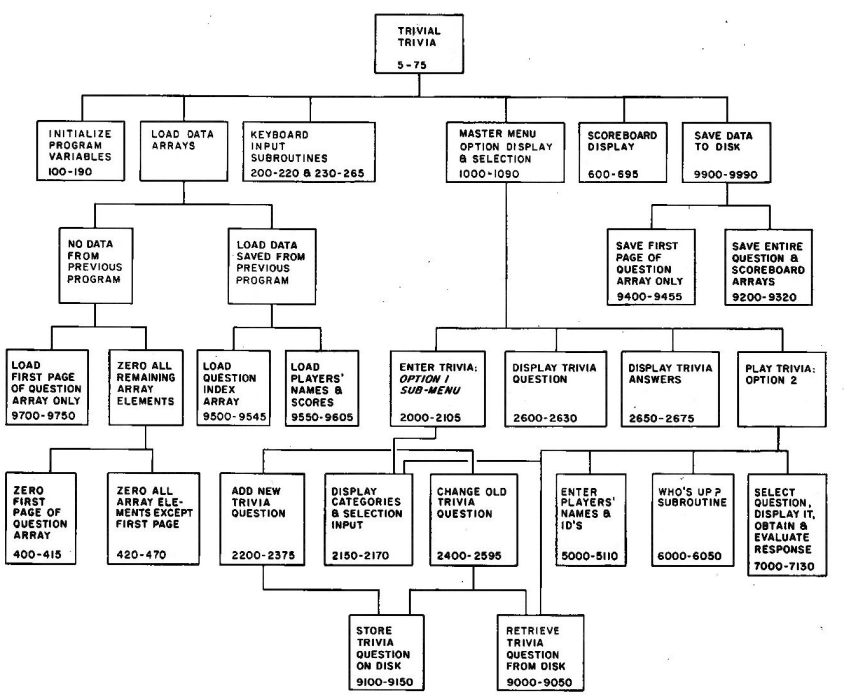
If you've ever wondered what *else* Applesoft can do, try designing your own game of Trivial Trivia.

To get around this problem, I decided to use 12 data files, three for each category. Three players can type questions into the data base. Each of these players' questions is placed into one of the three sets, separate from the questions others enter. When you run the program, the computer cannot draw questions for a player from the same set used to store that player's trivia entries.

Twelve data files require 12 disk file names. Since you use the same four categories for each of the three sets, I decided to set up a file-name array, F$(i,j), with two dimensions. The first dimension (i) corresponds to the category, while the second (j) refers to the set number within that category. To load the category names into the computer, I used a READ. . .DATA combination within a loop (lines 170–185). The program reads the four category names into the "zeroeth" set elements, F$(i,0). Appending the set number to the end of the name alters the category name, and the loop in line 180 enters the modified name into the array.

For example, if the first data element is ARTS, the program loads the word ARTS into element F$(1,0). It

Figure 1. Trivial Trivia organizational chart showing subroutines and their interrelationships.



loads the word ARTS1 into F$(1,1), ARTS2 into F$(1,2), and ARTS3 into F$(1,3). With this technique, you can specify the file you want tc access on disk by assigning appropriate numbers for that question's category (CN) and set (SN): F$(CN,SN).

The next problem is maintaining each player's running score for each category. To be useful, the program should store two numbers for each player/category: the number of correct responses and the total number of questions attempted. A three-dimensional array works perfectly.

Figure 2 shows a visual representation of this structure. Each horizontal layer, or row, belongs to one player. This row contains eight elements, arranged four across and two deep. Each element represents one category. You can enter the number of correct responses for a given player for each category into the four front elements in that player's row, and the total number of attempted questions into the four rear elements.

Using SC(i,j,0) to represent player i's number of correct responses for category j, and SC(i,j,1) to represent his or her total number of attempts, you can build very simple loops to display all ten players' scores—80 values in all. Lines 600–695 handle the scoreboard display; most of the code in these lines is for display aesthetics.

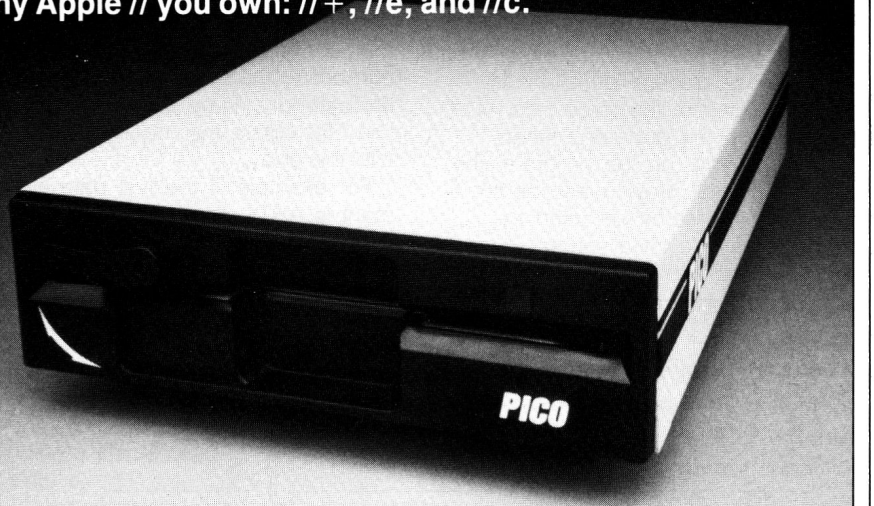
I had to solve one final problem before actually writing the program. If the computer were to select questions randomly, how could the program keep players from choosing a particular question more than once? The solution to this problem also requires a three-dimensional array, QA(i,j,k). (See **Figure 3** for a visual representation.) The QA(i,j,k) array has four horizontal layers, or rows, which correspond to the four categories of questions. Its three vertical layers, or sets, run from front to back as columns. It's 47 layers deep (although the program uses only layers zero through 41).

The program uses layers zero and 41 in this array for special purposes. Layer zero contains the actual number of questions currently saved in that particular category/set data file. That is, if ARTS2 has 17 questions, then QA(1,2,0) contains the value 17. Layer 41 keeps track of the number of questions in a given category/set data file that the computer has not yet used. The beginning of the program sets this layer equal to layer zero (lines 450–465). Each time you select a question from that file, the program decreases the appropriate element in layer 41 by one (line 7090). So whenever the computer generates random CN and SN to pick a question from file F$(CN,SN), it checks QA(CN,SN,41) (line 7040) to make sure it isn't zero. If it is, that indicates that no more questions are available from that category/set file.

Layers one through 40 correspond to the questions in the entire data base. Each question has a corresponding QA(i,j,k). For example, question 15 (RN = 15) in category 4, set 2, has a corresponding array element QA(4,2,15). The beginning of the program sets all of these elements to zero (lines 420–440). That's 480 data elements set to zero with five lines of code—such is the power available to programmers who use arrays. Then, as the computer calls up each question, the program gives its corresponding array element a value of one (line 7095). Each time the computer generates a new set of random numbers, it checks the QA(CN,SN, RN) element. If it has a value of one,

APPLE // OWNERS YOU'VE WAITED LONG ENOUGH

. . . for a half-height Apple® compatible disk drive that fits any Apple // you own: //+, //e, and //c.



—Faster, more precise tracking and larger capacity than standard Apple® drives.
—100% Apple® compatible for //+, //e, and //c external drives.
—Quieter and smoother running.
—Half-height, compact design . . . saves you space.
—//c adaptor plug included free!
—Works with Apple's new Unidrive
—One year warranty, 30 day money back guarantee.
—Suggested retail price: **$269.95**

//c AND UNIDRIVE POWER

New! Apple //c Disk Drive Adaptor Plug. Also Works With Apple's New Unidrive.

—Turns your Apple //+ or //e compatible disk drive into an Apple //c drive.
—Allows you to use your Apple compatible disk drive with Apple's new Unidrive
—Attaches in seconds—absolutely no soldering!
—5-year warranty, 30-day money-back guarantee.

FAST•SIMPLE•INEXPENSIVE ONLY $19.95

PICO products

Quality peripherals for IBM®, Apple®, and other leading microcomputers. Watch for more PICO Products at your local computer store—exceptional value and quality in computer accessories.

For Dealer and Distributor information please call or write:

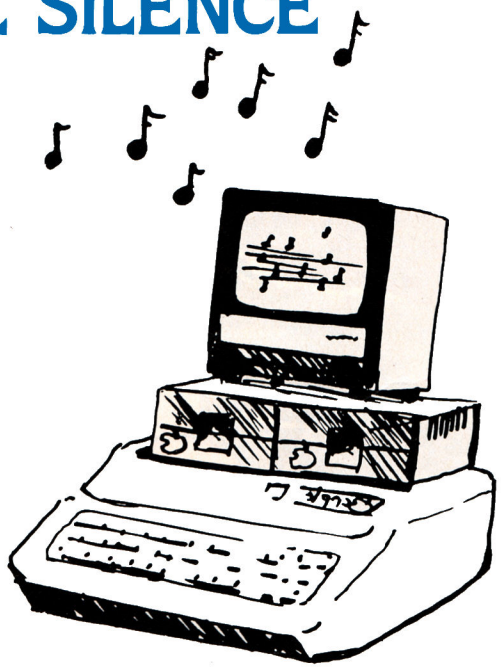
VISA
MasterCard

WGE International Ltd.
WGE Center, Rte. 202N
Peterborough, NH 03458
1 (800) 227-1560
1 (603) 924-9261 in NH

IBM is a registered trademark of International Business Machines, Inc. Apple is a registered trademark of Apple Computer.

MOCK·ING·BOARD

BREAK THE SILENCE



MOCKINGBOARD A is a stereo music and sound synthesizer with six voices. Suggested retail price $99.00. This model can be upgraded for speech synthesis with the purchase of a **MOCKINGBOARD B** speech upgrade. Suggested retail price $89.00.

MOCKINGBOARD C is all of the above in one package. Suggested retail price $179.00. Mockingboard A, B and C are compatible with the Apple II, II+ and IIe.

MOCKINGBOARD D is a stereo music, sound and speech synthesizer for the Apple IIc. Suggested retail price $195.00.

A-MAX is short for Audio Maximizer. A-MAX brings new dimensions of sound to your Apple or IBM. A-MAX replaces the internal speaker with a stand-alone case containing stereo speakers, a headphone jack and dual volume controls. Mockingboard may also be used with A-MAX. Suggested retail price $49.95.

THE DEVELOPERS' TOOLKIT provides easy-to-use software allowing you to incorporate music, sound and speech into your own BASIC programs. In addition, the Toolkit contains numerous other helpful utilities to simplify programming and make learning fun. Suggested retail price $29.95.

SPEECH DEVELOPMENT SYSTEM allows the user to easily create and modify customized speech at home using simple bar charts to change speed, volume and even inflection. Suggested retail price $39.95.

FOREIGN LANGUAGE RULE TABLES allow your computer to speak to you in French, German and proper British English. Suggested retail price $24.95.

CLASSIC ADVENTURE GAME takes you through a colossal cave in which you must collect treasures. Many who enter the cave are never heard from again. Classic Adventure is compatible with MOCKINGBOARD C and MOCKINGBOARD D. Suggested retail price $19.95.

Mockingboard sound is sweeter than ever! Watch for new and exciting titles this holiday season, such as **SKYFOX** by Electronic Arts, **WILLY BYTE** by DTI Data Trek, **ULTIMA IV** by Origin Systems, **UNDER FIRE** by Avalon Hill, **ADVENTURE CONSTRUCTION SET** by Electronic Art, **GUITAR MASTER** by Mastersoft, **AT THE GATES OF MOSCOW 1941** by Strategic Games and many more.

* The new Mockingboard D supports Music Construction Set and Under Fire. Check with your dealer for new titles that are being written for this Mockingboard.

To hear Mockingboard perform, visit your local dealer or call (401) 941-1130. For the name of your local dealer that carries Mockingboard, call 1 (800) 341-8001.

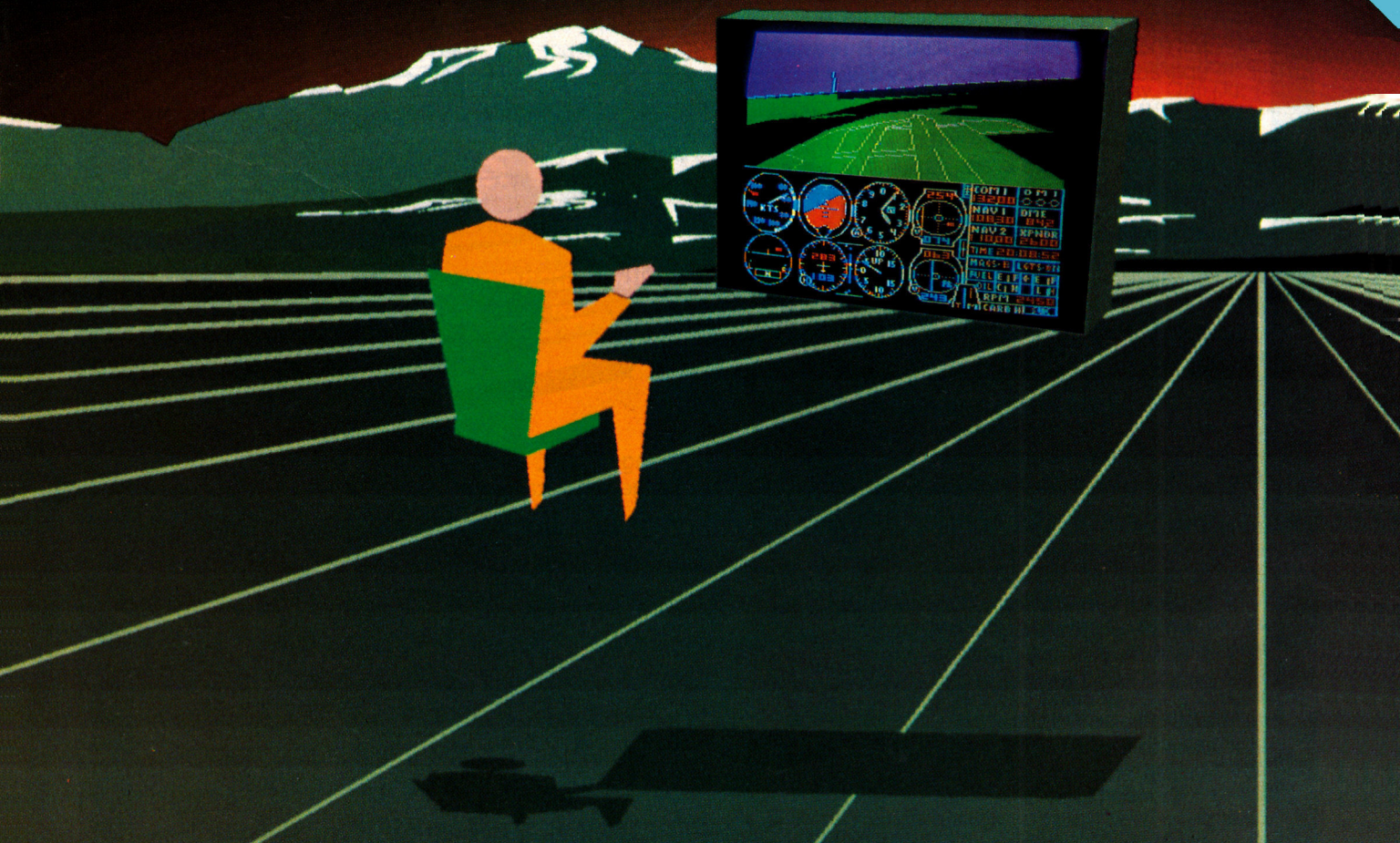
Apple™ is a registered trademark of the Apple Computer Company. IBM™ is a registered trademark of International Business Machines Corporation.

SWEET MICRO SYSTEMS, INC.
50 Freeway Drive, Cranston, RI 02920

Circle 221 on Reader Service Card.

Flight Simulator II

For Apple II+, Apple IIe, & Apple IIc



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

See your dealer . . .

or write or call for more information. For direct orders enclose $49.95 plus $2.00 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800 / 637-4983

Circle 156 on Reader Service Card.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Figure 2. Trivial Trivia's scoreboard array, dimensioned as SC(10,4,1) to account for ten players (1–10), four categories (1–4), and two layers (zero and one). Note that the zero rows and columns have been ignored for convenience in coding.

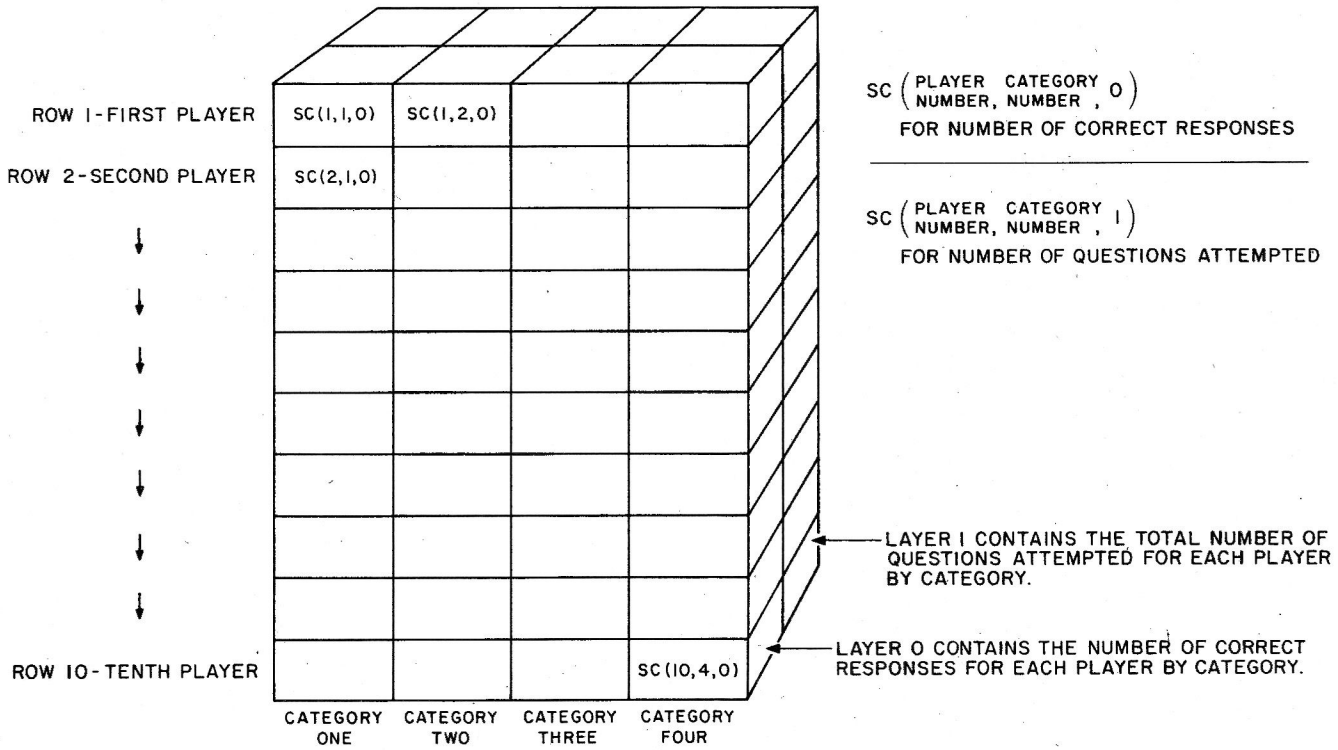
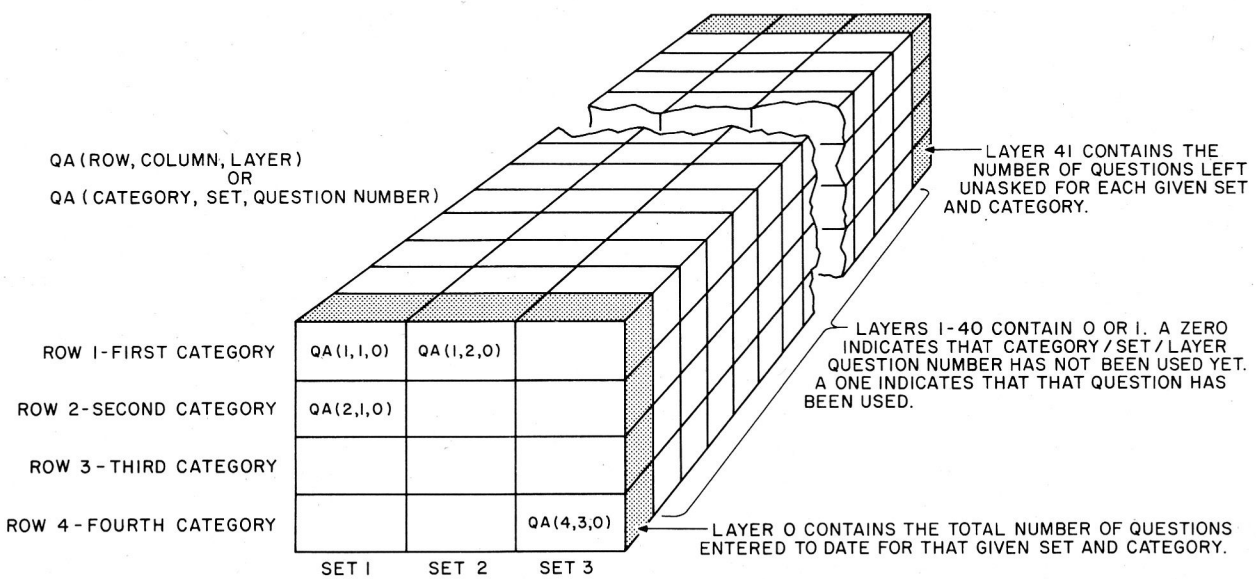


Figure 3. Trivial Trivia's question-index array, dimensioned as QA(4,3,47), although the program uses only layers zero through 41. The zero rows and columns have been ignored for convenience in coding.



IS YOUR APPLE // WORD PROCESSOR LETTING YOU DOWN?

STEP UP TO GUTENBERG® SR

IF YOU NEED...

customized screen fonts – to display up to 115 extra user-defined characters on the screen and print them as special 7×12 dot graphics in your text, automatically.

downloaded printer fonts – to dynamically change the printer's character set. Gutenberg supports font downloading into the Apple Imagewriter or DMP of up to 21 different fonts at 14 print pitches in proportional print mode and still micro-justifies the print line.

special alphabets – to print text in many different languages, including: Danish, Finnish, French, German, Greek, Hebrew, Italian, Polish, Russian, Spanish, Swedish, Syriac, Ukrainian, etc.

scientific symbols – for any type of technical writing.

graphic pictures – embedded in your text, banner headings for newsletters or letterheads, or big display lettering.

flexible print layouts – for best reproduction of your document. Gutenberg's advanced formatting language allows unrestricted placement of text.

GUTENBERG® SR IS THE ANSWER!

Gutenberg runs on all Apple // computers or compatibles with 64K of memory. Gutenberg supports the Apple Imagewriter and Apple DMP with printer font downloading, the C.Itoh Prowriter, the NEC 8023, all Epson MX-100 compatibles with regular graphics, and most letter-quality printers without the graphics option.

To request your **FREE** 16-page booklet "Your Introduction to Gutenberg JR + SR" write to:

Gutenberg Software Limited
47 Lewiston Road
Scarborough, Ontario
Canada – M1P 1X8

or phone: (416) 757-3320

or circle the appropriate number on the Reader Service Card.

Apple is a reg. trademark of Apple Computer, Inc.

the computer goes back to come up with a different value for RN, and thus a different question. With this design, no question appears more than once during a game.

Disk-File Record Structures

With random-access disk I/O, you must clearly define the structure you want to give each file's records. You need only one such definition for each type of file, but that definition must specify exactly how many bytes you plan to assign to each stored variable (or field). **Figure 4** contains the disk-record structures.

The easiest structure to define is one for the trivia data-base files. Since all 12 files contain the same type of information, you need only one structure definition. By assigning one trivia question/answer combination to each record, and specifying the number of bytes for each line the program will store in that record, you can determine the total size of each record to be 231 bytes, plus 1 for the end-of-record marker, for a total of 232.

The question-index array presents a different problem. Instead of storing a linear array, you're faced here with a three-dimensional array. I decided to store the array elements layer by layer in a record large enough to hold eight complete layers. Since the numbers the program stores never contain more than two digits, I decided to allot 2 bytes for each element. Eight layers then require 192 bytes (plus 1 end-of-record marker byte). These choices are somewhat arbitrary. Applesoft allows up to 239 characters in a string variable, so this presents an upper limit on record size if you transfer complete records into string variables (as I have, using XT$).

I used a variation of this technique for the scoreboard array, and saved information for five players at a time in each of two records. In this case, again arbitrarily, I chose to reserve 4 bytes for each numeric entry to be saved. Since I wanted to save the total number of players as well, I simply reserved the first 4 bytes from each record to store this value. A little wasted space here avoided some additional coding, which takes up its own space, not to mention extra effort.

Disk Input/Output

I've pointed out in previous columns (see July 1985, p. 68, August 1985, p. 53, and November 1985, p. 52) that you can generalize disk I/O with a few simple lines of code. The ten lines of BASIC code between 9900 and 9990 in the Trivial Trivia **Program listing** handle all actual disk-access functions from the program. Note the following features:

1) Common file-name variable, F$.

2) Common record length, 232. (You could change this to a variable, but in this program the advantage of that would be minimal.)

3) WRITE and READ commands specified by the value you assign to a subscript variable, IO.

4) Common record-number variable, RN.

5) Common data carrier, XT$.

The subroutines that prepare data for output to the disk (shown by making IO equal to zero at the start) begin by initializing XT$ to null, then building it up to a full record. The program first converts numbers to strings, then chops them down to two digits, or a single digit and a space. Since the program stores the values in arrays, extensive use of nested loops simplifies the process considerably.

When you use XT$ to retrieve data from the disk, you must segment the original XT$ variable at the appropriate places to remove the program variables from it. To do this you use the MID$( ) function, which lets you remove a string of characters from a larger string, and specify the number of characters you want to remove and where in the larger string you want the operation to begin.

For example, if A$ = "HAPPY NEW YEAR", then MID$(A$,4,6) is "PY NEW". As before, nested loops provide a means of carrying out this task with minimal code. The trick is to deduce the mathematical relationships that let you use the loop variables within the MID$( ) function so that the program excises just the portions you desire at each loop cycle.

Study the examples in lines 9020, 9035, 9535, 9575, 9590, and 9730. Each of these subroutines not only uses XT$ as the data carrier, but each assigns a value of zero or one to IO, an appropriate file name to F$, and a value to RN. The program must perform these tasks before it calls the disk-access subroutine at 9900. (Subroutines 9000 and 9100 actually use values you've assigned to RN before the program calls the respective subroutine.)

1600k 16-Bit IIe!

Why pay more for a lesser card that only works in 8-Bit just because it's advertised a lot? You can buy Checkmate Technology's **State-Of-The-Art MULTIRAM IIe**™ that works great in 8-Bit, has a true 16-Bit Co-Processor port, optional 16-Bit 65C816 Co-Processor card, **& GET HOLIDAY BONUES*** from Coit Valley Computers!

- **MULTIRAM IIe IS A DIRECT SUBSTITUTE FOR RAMWORKS**™ or Apple Extended 80 column cards. Because it follows Apple's strict guidelines, **MULTIRAM RUNS ALL 3rd PARTY SOFTWARE** that the other cards do, and has 80 columns & Double Hi-Res Graphics.
- ***UP TO 768k MAIN BOARD MEMORY - 50% MORE THAN RAMWORKS AT A LOWER PRICE!***
- **UP TO 768k MORE OPTIONAL PIGGYBACK BOARD MEMORY + FREE RGB ON THE SAME BOARD** - and unlike Ramworks piggyback, there is no potential to interfere or touch cards in slot-1! **A TOTAL OF 1600K IIe MEMORY AT A LOWER PRICE!**
- **OPTIONAL 16-Bit 65C816 CO-PROCESSOR CARD** that plugs into the motherboard & then into **ONLY MULTIRAM's Port** using no slots! **TRULY STATE-OF-THE-ART, BUT IT CAN'T RUN ON RAMWORKS.**
- **FREE ULTRA-FAST RAM DISK SOFTWARE** that isn't like Ramworks $29 Ram disk software. It can be run alone or **WITH APPLEWORKS**™**. FREE RAM TEST** & optional CP/M and Pascal Ram disk software too!
- **FREE APPLEWORKS EXPANDER SOFTWARE** that is run only once to permanently modify AppleWorks so all features are automatic and invisible, can load ALL or optional PORTIONS of AppleWorks entirely into memory, run 20 x faster, increase the Desktop to 1125k, auto-segment large files onto multiple disks, store over 5325 records, and can run with our FREE Ram disk software! An increased Clipboard and Word Processor update is due soon.
- **15 DAY MONEY BACK GUARANTEE, FREE SOFTWARE UPDATES, 64k OF MEMORY FREE WITH EACH 256k or 512k CARD, & QUANTITY DISCOUNTS FROM COIT VALLEY COMPUTERS. EXCLUSIVE 5 YEAR WARRANTY THAT, UNLIKE RAMWORKS, INSURES COVERAGE NO MATTER WHERE YOU BOUGHT IT!**

	OUR LOW PRICE
64k **MULTIRAM** IIe	**155.**
128k **MULTIRAM** IIe	**173.**
320k **MULTIRAM** IIe	**224.**
576k **MULTIRAM** IIe	**279.**
768k **MULTIRAM** IIe	**334.**
1024k **MULTIRAM** IIe	**579./FREE RGB**
1280k **MULTIRAM** IIe	**629./FREE RGB**
1536k **MULTIRAM** IIe	**679./FREE RGB**
64k Memory Expander Chips (8)	**25.**
256k Memory Expander Chips (8)	**70.**
Pico™ Slimline Drive IIc, IIe, II+	**178.**
Apple IIe Enhancement Kit	**62.**
65C816 Co-Processor Card	**179.**
CP/M or Pascal Ram Disk (each)	**17.**
Multiview 80/96/132/160 Card	**249.**

For the HOLIDAYS* until 1-15-86, we've lowered many prices & we'll give you the choice of Jeeves™ at $29, Supercalc 3A™ at $124, Pico™ Joysticks at $26, CP/M or Pascal Ram Disk software at $17, **WITH EACH 576k OR LARGER MULTIRAM CARD.** But buy now because prices and specials are going up on January 15th!

640k 16-Bit IIc!

Checkmate Technology's **State-Of-The-Art MULTIRAM C** cards easily expand your IIc up to 640k, come with the same **FREE SOFTWARE** as **MULTIRAM IIe,** & are 100% compatable with all IIc software/hardware. **MULTIRAM C** is non-upgradable & **MULTIRAM CX** can be upgraded with a **16-Bit 65C816 Co-Processor kit! CALL FOR CURRENT PRICING & QUANTITY DISCOUNTS!**

- **LOW COST EASILY INSTALLED 16 - BIT CO - PROCESSOR OPTION ($135) on the MULTIRAM CX** - unavailable from the competition.
- **NO JUMPER WIRES CLIPS, OR DRIVE REMOVAL REQUIRED FOR INSTALLATION. ALL CHIPS ARE SOCKETED AND REMOVABLE** - unlike the competition.
- **USES ABOUT 50% LESS POWER** than the competition-causing less power supply strain or battery pack drain!
- **15 DAY MONEY BACK SATISFACTION GUARANTEE** from Coit Valley Computers. **5 YEAR WARRANTY THAT, UNLIKE THE COMPETITION, INSURES COVERAGE NO MATTER WHERE YOU BOUGHT IT!**
- **LOWER PRICES** - Coit Valley Computers sells both 512k **MULTIRAM C and CX** cards for less than even the competitor's 256k card! And our software updates are free, while the competition usually charges $10 or more!

	OUR LOW PRICE
256k **MULTIRAM C**	**239.**
512k **MULTIRAM C**	**299.**
256k **MULTIRAM CX**	**299.**
512k **MULTIRAM CX**	**358.**
16-Bit 65C816 Kit	**135.**

Terms: Add $4-Ground or $6-Air shipping & phone # to all U.S. orders. Add 3% for P.O.'s (3% 5 net 30) & MasterCard/Visa (include #/expir). For fastest delivery send Cashier's/Certified check, Money Order. C.O.D. (add $5) & personal checks accepted (allow 14 days). Tex res add 6⅛% tax. **CALL FOR LATEST PRICES & QUANTITY DISCOUNTS!**

MULTIRAM/Multiview, Ramworks, AppleWorks, Pico, Jeeves, Supercalc respective trademarks of Checkmate Technology, Applied Engineering, Apple Comp, WGE Int, PBI Inc, Sorcim.

COIT VALLEY COMPUTERS **(214) 234-5047**
14055 Waterfall Way Dallas, Texas 75240

FREE?DISKETTES

SAVE MONEY! Apple II series users can use the diskette flip side, if another "write enable" notch is correctly made.

TOP NOTCH by QUORUM quickly **SOLVES** that **PROBLEM.**

It's like FREE DISKETTES!

- Stainless Steel Guide
- Easy Leverage Handle
- Clippings Catcher
- Square Notch Cut
- Black Finish

Lifetime Warranty

Awarded the only A+ GRADE in a comparison test published by the INTERNATIONAL APPLE CORE.
"The best I've found. . ."
IAC Reviewer

Certifix™

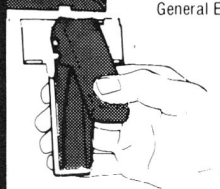
BE SAFE! The flipside of a single sided disk may have flaws. Any disk is **CERTIFIED 100% ERROR FREE** with CERTIFIX. **IT "LOCKS OUT" BOTH DOS 3.3 & ProDOS DISK FLAWS.**

- LOCKS OUT ProDOS & DOS 3.3 FLAWS
- SAVES STATUS REPORT ONTO DISK
- AUTOMATIC ProDOS/3.3 FORMATTING
- CREATE 40 trk DISKS & SYSTEM MASTER
- RECORDS TEST DATE onto disk
- NOT COPYPROTECTED

FREE CERTIFIX BONUS PROGRAMS
- Undelete DOS 3.3 files
- Test and Adjust Disk Drive Speed

Prevent Data Loss!
CERTIFY & FIX every disk with CERTIFIX!

Get THE BEST!
Ask our Customers;
U.S. National Bureau of Standard
TRW • IBM • Digital Research • AT&T
U.S.Naval Weapons Research Center
Alcoa • Rockwell International
General Electric Corporation



FREE!
64 Write Protect Tabs
32 Diskette Labels
If you get the DISKETTE FLIP-KIT which contains TOP NOTCH and CERTIFIX

100% Money Back Satisfaction Guarantee!

DISKETTE FLIP-KIT only $29.95
TOP NOTCH is $14.95
CERTIFIX is just $24.95
Add $2 s/h • CA add 6.5% tax

For your nearest dealer
or to order direct.

CALL TOLL FREE
1-800-222-2824
In CA: 1-800-222-2812
From 8 am - 5 pm PST

Dealers Invited

QUORUM INTERNATIONAL, Unltd.
INDUSTRIAL STATION P O BOX 2134 IC
OAKLAND, CA 94614

APPLESOFT ADVISER

Error-Free Data Input

Every program that uses keyboard input should have appropriate built-in error traps to keep bad entries from crashing the program. Many programs include three to ten lines of code after each INPUT statement to handle error trapping, but that's very inefficient. In Trivial Trivia, I've included a single keyboard-input subroutine at lines 230–265 to handle the data-verification process for most of the program's keyboard entries.

Realizing that most keyboard input in this program involves typing Y, N, STOP, or some number within a prescribed range, I've tailored the subroutine to deal specifically with these cases. Flag variable YN is zero unless the question demands a Y or N response, in which case the program gives YN a value of one. If the situation requires numeric entry, the program gives S the smallest allowed value, and L the largest. The program assigns values to either YN or S and L before the GOSUB 230 call.

At line 230, the program initializes the input variable R$ and another flag variable, QT, before the INPUT R$ command. After the INPUT R$ command, the program checks R$ to see if you've typed the word STOP. Here I've broken a fundamental rule of BASIC: You should never use a GOTO to jump out of a loop or subroutine. Yet here the computer issues a GOTO 40 command if you've typed in STOP. This procedure is justified because lines 40–75 close the program without further ado, so you'll never feel the consequences of GOTO 40. (You can occasionally break the rules of programming, but be sure you know what you're doing and why.)

If R$ passes the STOP test, the program sets S and L to zero if this is a Y/N question, and checks R$ for a Y or N response. If R$ isn't either of these characters, the subroutine gives the flag variable QT a value of one, displays the message INVALID ENTRY. . .PRESS RETURN, and returns to the calling program. If QT is set, the program loops back to repeat the original question.

If you haven't set YN when the program calls this subroutine, the program assumes that the situation required a numeric entry, with a value from S to L allowed. Using the VAL( ) function, the program assigns R to the numeric equivalent of R$. The program then determines whether R is within the allowed range. If it isn't, the subroutine sets QT to one and

CRACKING TECHNIQUES

Xmas Sale limited offer expires December 31, 1985

Kraking by Disk Jockey.....$64.95 ....SALE..$50.00

Two full sides crammed full of detail, step by step, Kraking tutorials, tips and Kraking programs by the new King of the Krakers.

TWO FULL SIDES
10 Chapters — 8 Appendices
15 Tutorials — 9 Programs

Kraking by Disk Jockey Vol II....$49.95 ADV.SALE..$40.00
Kraking by Disk Jockey Series..$114.95 ADV.SALE..$85.00

Kraking by Disk Jockey Volume II is the great sequel to last years most popular cracking disk. In addition to the many cracks and tutorials it also contains the all new cracking program:
SNOOPY & THE DOCTOR
Snoopy & The Doctor are our answer to The Inspector & Watson, a complete set of disk utilities. Advance orders are being taken for shipment in December 1985.

Xmas Pak
Both CT '86 & Krak by DJ Vol II...$89.90 ADV.SALE..$70.00

CRACKING TECHNIQUES '83.....$39.95 ....SALE..$35.00
CRACKING TECHNIQUES '84.....$39.95 ....SALE..$35.00
CRACKING TECHNIQUES '85.....$39.95 ....SALE..$35.00
CRACKING TECHNIQUES '86.....$39.95 ADV.SALE..$30.00
COMBINATION OFFER - CT '84 & CT '84.....SALE..$65.00
TRIPLE OFFER - CT '83, CT '84, & CT '85 ....SALE..$95.00
CT SERIES — CT '83,'84,'85, & '86 — ADV SALE.$115.00

Cracking Techniques, full of tips and tricks of disk copying and cracking, which are complete sell outs at the many computer shows, are now being made available through mail order.

These highly specialized disks contain tips and techniques provided by the top crackers of the world. Anyone who has traveled the vast electronic highways of the computer bulletin boards will easily recognize these famous names: Apple Bandit, Disk Zapper, Red Rebel, long John Silver, Axe Man, The Burglar, Captain Nibble, Mr. Xerox, Lockbuster, The Colossus, Mister C, Bozo NYC, Clone Man, Reset Vector, The Prisoner, REO Software, Parity Error, Woodpecker, The Beast, Trystan II, the Ponqus, Jim Phelps, The Marauder, and the Disk Jockey. Some of these famous software pirates have been featured on **ABC's NIGHTLINE, NBC's TODAY**, in **Newsweek, Infoworld, Tech Weekly**, and in the **New York Times.** You can find out why all these people have earned their heavy reputations! Here now are the techniques that made them famous.

Included on the disks are full descriptions on the use and applications of **DEMUFFIN** and **DEMUFFIN+**, techniques for modifying a 16k RAM card into a fake ROM, a dissertation on special techniques, **Non Maskable Interrupts, Boot Tracing, Brute Force**, and several sections on handling **Foreign DOS**. The internationally famous Axe Man has several detailed sections on different techniques including "How to use a RAM card as a major cracking tool." Also included are the complete programming codes for building your own copies of the legendary **Bozo's Cracker ROM** and the **Lockbuster's F8 ROM.** Contains seven (7) Apple Bandit files including how really use Copy][+ and the super COPYA and the enhanced COPYA from the **Disk Jockey.**

All of the information gathered together on these disks are the highlights of the 1982-85 pirating season as featured on the infamous Boston Pirate's Harbor bulletin board. **Pirates** Harbor has long been established as the international **Mecca** of software cracking. As an added bonus, complete cracking instructions are provided for many of the top pieces of software, both for games and business. These are not obscure, arcane pieces of lore; they are practical tips and techniques that you can start applying immediately the day you receive your disks.

MacCrack.....$74.95 ....SALE..$65.00
MacCrack Volume II.....$54.95 ADV.SALE..$40.00
MacCrack Series.(Both).....$129.90 ADV.SALE.$100.00

MacCrack is now available for the MACINTOSH. Just like its great forerunners, Cracking Techniques for the Apple II, II+, //c, & //e, this great new disk is crammed full of cracking tutorials, tips, and disk utilities for the MACINTOSH. **MacCrack** Vvolume II will be available in January 1986 and is on advance sale now.

For MasterCard and VISA only !!
Call toll free - Ask for Operator 68

1-800-824-7888

In Alaska or Hawaii, call 1-800-824-7919

PIRATES HARBOR P.O. Box 8928 Boston, MA 02114 617-227-7760 Voice 617-720-3600 Modem

These products should NOT be used for illegal purposes. Apple and MACINTOSH are trademarks of Apple Computer, Inc. Cracking Techniques, Kraking by Disk Jockey, and Mac-Crack are trademarks of Pirates Harbor, Inc.

YES, I want to learn the Secrets of Cracking
Please RUSH:

____	Kraking by Disk Jockey (2 sides)	$ 64.95	$ 50.00
____	Kraking by DJ Vol II 1 side (adv order)	49.95	40.00
____	Kraking by DJ Series Both (adv order)	114.90	85.00
____	Cracking Techniques '83	39.95	35.00
____	Cracking Techniques '84	39.95	35.00
____	Cracking Techniques '85	39.95	35.00
____	Cracking Techniques '86 (adv order)	39.95	30.00
____	Combo CT '83, & CT '84	79.90	65.00
____	Triple CT '83,'84 & '85	119.85	95.00
____	CT Series All Four CT's (adv order)	159.80	115.00
____	Four Pak CT '83,'84,'85,& Krak by DJ	188.80	135.00
____	Five Pak CT Series+Krak by DJ(adv order)	224.75	155.00
____	Six Pak CT & Krak Series (adv order)	274.70	185.00
____	XMAS Pak Krak by DJ II+CT'86 (adv order)	89.90	70.00
____	MacCrack	74.95	65.00
____	MacCrack Volume II (adv order)	54.95	40.00
____	MacCrack Series (Both) (adv order)	129.90	100.00

Shipping included for USA. Massachusetts residents add 5% sales tax

[] Check Enclosed for $_____

[] Mastercard [] Visa _____ Exp Date _____
I understand that Cracking Techniques '86 & MacCrack Volume II will not be shipped until January 1986, and Kraking by DJ Vol II in December 1985. Payment must be in U.S. funds.
All other items shipped ASAP. No COD's! ALL SALES ARE FINAL!

Name _____ Phone _____
Address _____
City _____ State _____ Zip _____

Circle 41 on Reader Service Card.

Circle 14 on Reader Service Card.

Why Are Apple Owners So Loyal?

People who have the best often are, but in the case of Apple there's more. Apple owners think back to how Apple got started in 1977, just two people working out of a garage and what happened is the talk of Wall Street and the computer industry as well. Many like the fact that Apple only makes computers. Unlike their competition they don't make typewriters, copiers or telephones. They do just one thing and that's one reason they do it so well.

At Applied Engineering we think the same way. You see, Applied Engineering is the only major hardware manufacturer totally dedicated to the Apple computer. Whereas most of our competitors must divide their customer support and engineering time between IBM, Atari, Radio Shack or other computers, our engineers only design products for the Apple. This dedication allows us to be much more familiar with the Apple and the people who use them.

We don't expect you to buy an Applied Engineering peripheral on loyalty alone, but when you compare our products to those made by QUADRAM, MICROSOFT, AST and others you'll find out why Applied Engineering means a quality design, innovation, craftsmanship and total Apple compatibility.

The other guys do pretty well considering how busy they are with IBM. But at Applied Engineering, ALL of our work involves the Apple. In fact, all of our employees were Apple owners before they came to work for us. The people in shipping, engineering, quality control, order entry, all use Apples at work and at home.

This one track mindedness of ours allows us to offer the largest storage with AppleWorks and Supercalc and our Z-80 card now includes the new 4.0 operating system. We can expand the Apple IIe to over 3 MEGABYTES of memory and we've got clock cards, music cards, A to D converters, digital controllers, and a BSR system so your Apple can control your whole house with no additional wiring!

Applied Engineering recognizes that we've got to do a better job than our IBM counterparts because we know you're smarter than the average computer buyer, you bought an Apple. You see, our competition has it a little easier, their customers aren't as smart as you. After all, they bought the wrong computer.

So if you need more memory, or 80 columns, or RGB color, double hi res graphics, if you want to know the time and temperature or other "real world" conditions, if you'd like to run CP/M software, have a RAM disk, increase the storage of AppleWorks and other programs, if you want your Apple to play music, talk and sing, if you'd like your Apple to control the lights and appliances in your house, then do what NASA does, what Ford does, what the U.S. Government, Hughes Aircraft, Honeywell, Westinghouse, AT&T, Apple Computer, and even what Steve Wozniak does, call Applied Engineering. Then you will discover what thousands of companies and over a hundred thousand Apple owners already know, that you can be smart and loyal all at the same time.

We Set the Standard

APPLIED ENGINEERING

(214) 241-6060

For information and specifications on Applied Engineering's line of Apple peripherals, please see our ads in this magazine. Prices are given.

displays the error message above. When it returns to its previous place in the program, the computer cycles back to repeat the original question.

You can accomplish all this with an eight-line subroutine and by substituting a line such as:

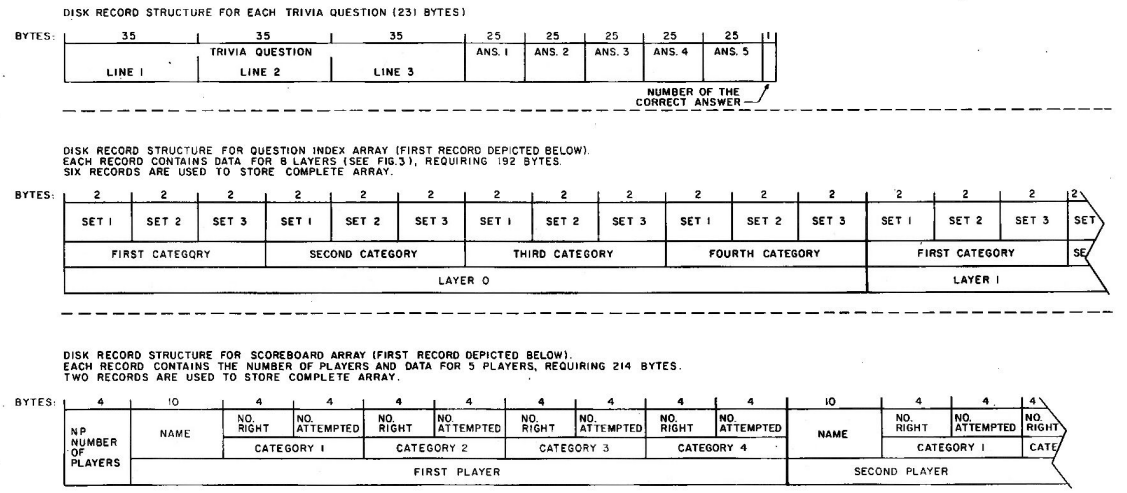
```
S=1: L=5: GOSUB 230: IF QT=1 THEN ####
```

for the traditional INPUT command.

Question Selection

Figure 5 contains the flowchart for lines 7000–7130, the subroutine in Trivial Trivia that generates a random set number, SN, from a given category CN. It uses the value as the player identification number PN, and employs values in the QA array to determine whether the computer has selected an allowable question for the

Figure 4. Disk-record structures for Trivial Trivia.



NEW FOR THE APPLE IIC

THE **FingerPrint IIC** LETS YOU PRINT WHATEVER YOU HAVE ON YOUR SCREEN, WITH JUST THE PUSH OF A BUTTON, AND WITHOUT HAVING TO INTERRUPT YOUR PROGRAM.

IT'S THE ONLY WAY TO PRINT, OR SAVE TO DISK, ANY SCREEN, ANYTIME, WITH ANY PROGRAM, COLOR OR BLACK & WHITE.

- NO SOFTWARE REQUIRED
- ITS SIMPLE TO INSTALL IN YOUR APPLE IIC
- COMPATIBLE WITH ALL SOFTWARE INCLUDING APPLE WORKS, MOUSE PAINT AND LOGO
- 40/80 COLUMN TEXT DUMP
- HI-RES, LO-RES, DOUBLE HI-RES AND MIXED MODE SCREEN DUMPS, IN COLOR OR BLACK & WHITE
- OVER 20 COMMAND OPTIONS CAN BE EASILY ACCESSED WITH THE EXCLUSIVE **FingerPrint IIC** MAIN MENU
- COMMAND OPTIONS INCLUDE ROTATED 90°, INVERSE, AND DOUBLE WIDTH GRAPHICS
- USE YOUR APPLE IIC AS A TYPEWRITER, TYPE DIRECTLY TO YOUR PRINTER OR SEND COMMANDS TO THE PRINTER
- SAVE ANY SCREEN TO A DISK WITHOUT INTERRUPTING THE PROGRAM
- WORKS WITH ALL IIC COMPATIBLE PRINTERS INCLUDING THE COLOR IMAGEWRITER II, AND MOST PARALLEL PRINTERS
- 2 YEAR HASSLE-FREE WARRANTY

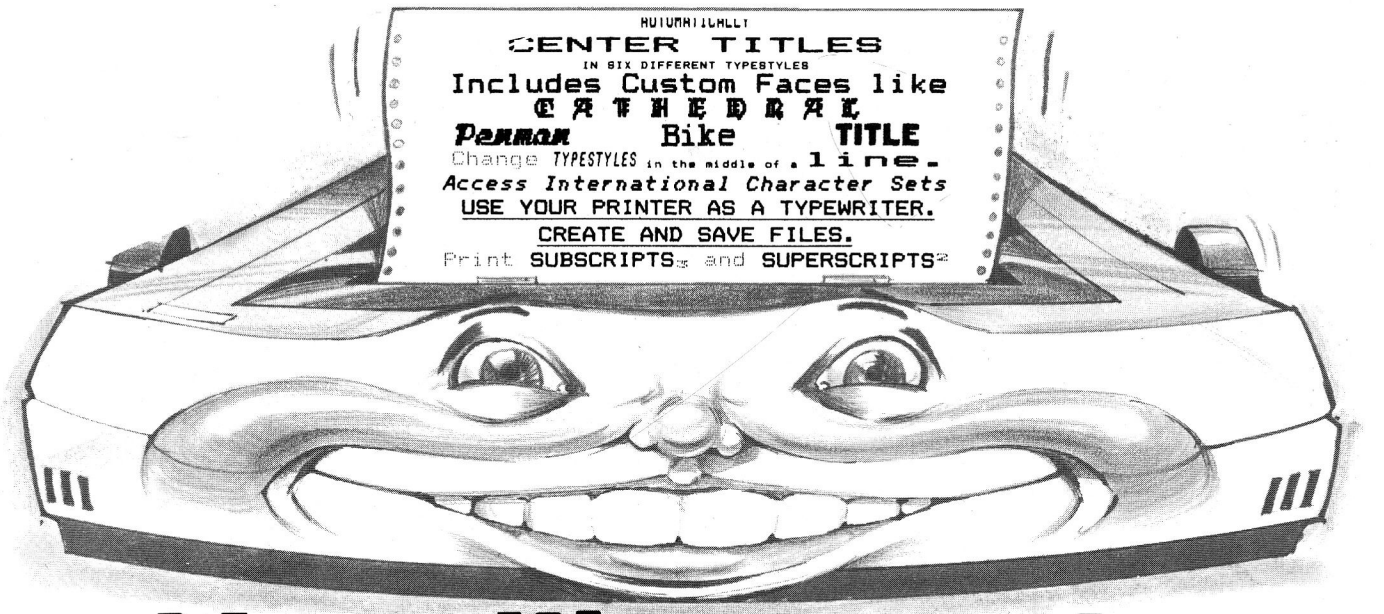
Don't feel left out if you own an Apple IIe or compatible computer. The original FingerPrint Plus printer interface card gives you IIe owners all the advantages of the FingerPrint IIC and more. Dual serial and parallel ports, modem capabilities and over 30 command options that make the FingerPrint Plus the finest printer interface card available for the Apple IIe.

*Suggested retail price for FingerPrint IIC and FingerPrint Plus is $149.00.

For more information on the FingerPrint IIC and FingerPrint Plus, and the dealer nearest you, contact:

THIRDWARE COMPUTER PRODUCTS™

4747 N.W. 72 AVENUE ▪ MIAMI, FLORIDA 33166 ▪ (305) 592-7522



Now it's easy to look good on paper.

FACELIFT™ 2 has six integrated programs that make it really easy to get what you want out of your printer*.

The Easy Way To Dress Up Everything You Print.
These are only a few of the hundreds of size and style combinations you'll get just by touching a typing key:

CATHEDRAL Cathedral
Penman Penman Penman Penman
TITLE TITLE TITLE
BIKE BIKE BIKE BIKE BIKE Bike
So many SIZES and combinations they cannot all be shown

The Perfect Enhancement To Other Programs.
For printouts to suit your different needs or moods, the FACELIFT 2 FACES and CUSTOM FACES programs are compatible with the best selling LOTUS 1-2-3™, Wordstar™ and most popular spreadsheet and word processing programs.

Or A Simple To Use, Mini-Word Processor.
DOCUMENT, the FACELIFT 2 MINI-WORD processor lets you save files for later print-outs in any FACELIFT styles.

Easily Turns Your Printers Into Typewriters.
Use the KEYBOARD program to type memos, notes or long documents directly into your printer from your computer keys. Mix typefaces on a page, or within a single word. Set margins, indent and edit before printing. All without ever having to create files. There's even a wordwrapping feature.

Or use KEYBOARD to type directly into COMREX CR-II and CR-III and BROTHER HR series letter quality printers. Great for envelopes and other quick typing chores.

Quickly Centers Titles Anywhere On A Page.
The TITLE program lets you automatically center headings and titles in six different sizes without ever creating a file.

Takes You International.
The INTERNATIONAL CHARACTER SETS for Spanish, German, French, Swedish, Italian, Danish, Japanese and British are only a keytsroke away.

And It's Fast And Easy To Learn.
You can learn FACELIFT 2 in minutes. Honest. And at an easy $49.95, you'll be looking good on paper in no time at all.

With the new FACELIFT 2™

Now available for the Apple II Series, IBM PC, AT, XT and their true Compatibles.

TO ORDER CALL TOLL FREE 1-800-628-0304 (In California 1-800-423-7907)

Please rush me _____ copies of **FACELIFT 2** at $49.95 each plus $5.00 postage and handling (Total $54.95) California residents add 6.5% Sales Tax (Total $58.20)

☐ Check/M.O. (Make checks payable to Companion Software, Inc.)

☐ MasterCard ☐ VISA Account No. Exp. Date

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

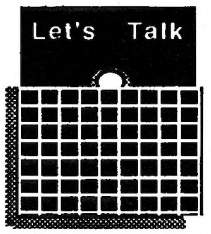
I have the following computer make/model _____

COMPANION SOFTWARE, INC. P.O. Box 6210, Buena Park, CA 90622 IC

*PRINTERS: EPSON FX, RX, LX, LQ-1500 and true Compatibles. Partially compatible with EPSON MX (with GRAFTRAX) and IBM Graphics Printers.

DEALER INQUIRIES WELCOMED

PEOPLE ARE TALKING ABOUT LET'S TALK™



A solid future for the latest and most exciting phase of the telecommunications explosion.
A+ MAGAZINE

Serves as a sophisticated answering machine and information center. You can set up a micro version of CompuServe in your office, school, or home.
InCider

Callers can access 1,000's of files of your business information on-line.
Business Software

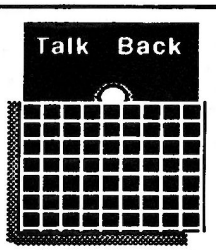
Provides professional host telecommunication capabilities, FAR BEYOND the standard bulletin board software.
Call A.P.P.L.E.

I've operated a BBS system for years. Your system makes GBBS and Networks look like stone age material. It is the best that I've seen.
Randolph Sopicky - Ca.

You couldn't have made it any simpler Now everyone can afford to go on-line.
Personal Computing On-line

It's not often we give an A+ rating to any software, but Let's Talk is going to get one. It should be your first choice.
The /// Magazine

Software that lives in your Apple not on the shelf. Find out why people are buying Apples to run Let's Talk. Have your computer call for a demonstration
408 427-0310 Modem
Let's Talk: DATABOARDS $125
Russ Systems, (//e - //c - ///)
320 Dufour St. Santa Cruz, Ca 95060
408 427-1540 Voice



New
Talk Back™ the access software your apple is looking for.
//e //c
Introductory offer ... $49

Available at your local dealer.

Circle 46 on Reader Service Card.

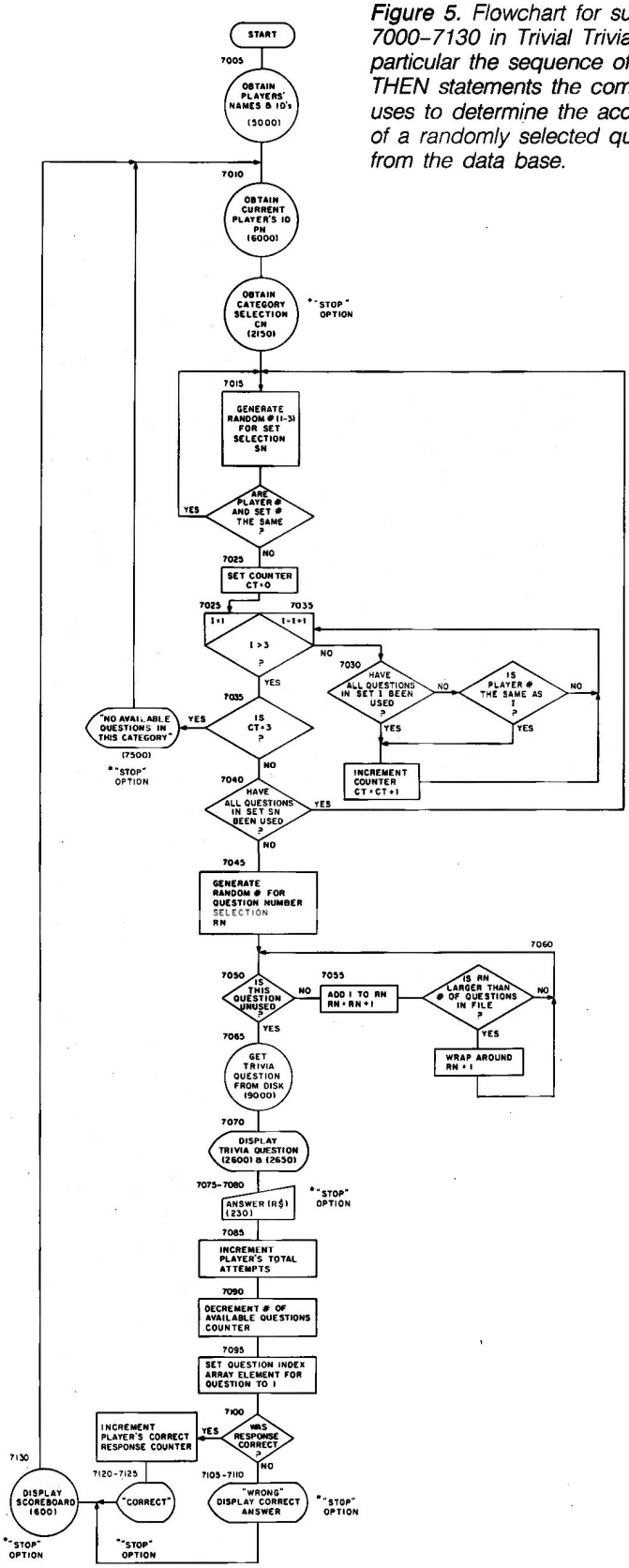
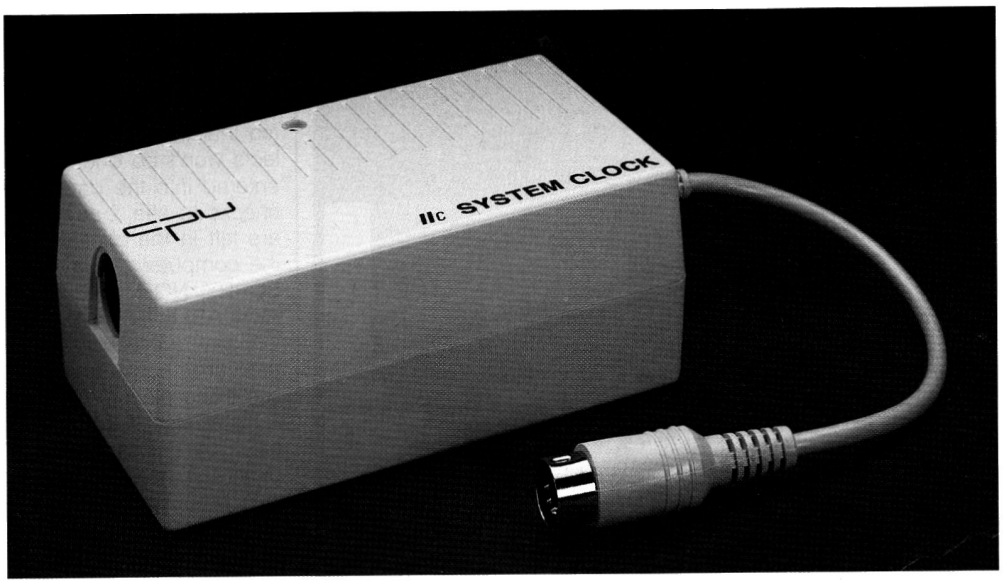


Figure 5. Flowchart for subroutine 7000–7130 in Trivial Trivia. Note in particular the sequence of IF. . . THEN statements the computer uses to determine the acceptability of a randomly selected question from the data base.

NEW PRODUCT



IIc SYSTEM CLOCK

- Fully ProDos compatible
- Automatic time and date stamping
- Easy to use from BASIC
- Battery operated, uses 3 "AA" batteries (will last 1-2 years before simple replacement)
- Date has year, month, date and day of week
- Time has hours, minutes and seconds
- Will time and date stamp AppleWorks files
- Will display time and date on the AppleWorks screen
- Auto access from AppleWorks data-base (just use a time and date field)
- Pass through serial port - The IIc system clock can plug into either the modem or printer serial port, then modem or printer plugs into the clock
- No hassle 5 year warranty
- Only $79.00

"We Set the Standard"

214-241-6060 APPLIED ENGINEERING 9 AM - 11 PM

A computer store's service at mail-order prices.

Because we're both.

Our commitment to service is why so many private individuals, schools and Fortune 1000 companies choose Micro City. If in the Chicago area, please visit our retail store at 24W500 Maple Ave., Naperville, IL 60540.

HARDWARE for APPLE

DISK DRIVES FOR APPLE
Super 5 Direct Slim Drive II+, //e (year warranty) ...$159
Super 5 Dir. Slim Drive //c ...165
PACE AP-50 Full Height for II+, //e ...145
Disk Drive Controller II+, //e ...45

GENERIC HARDWARE
16K Ram, II+ ...39
Z-80 Card, II+, //e ...42
Cooling Fan, 2 outlets, Surge Protect, II+, //e ...29
Joystick, Fire button, (Spec. II+ or //e) ...29
Computer Case, II+ ...59
Replacement Keyboard, II+ ...69
Case w/built-in Numeric Keypad ...119
RF Modulator ...19
Power Strip, Surge Protect, 6 Outlets ...19

ADVANCED LOGIC SYSTEMS
CPM Card, II+, //e ...249
Z Engine II+, //e ...129
Smarterm II, II+, //e ...129

AST
Multifunction Board, //e ...169

CH PRODUCTS
Mach II Joystick (Spec. II+, //e, //c) ...38
Mach III w/fire button (Spec. II+, //e, //c) ...45
Paddlestick Spec. II+, //e, //c 38

CALIFORNIA COMP. SYS.
Clock Calendar ...89
7711 Async Ser. Interface ...99

COMPUTER ACCESSORIES
Power Dir. P22 ...89

COMREX
A-B Switch Box (spec. par/ser ..59
Centronics M/M or Serial M/M Cable ...22.95

CURTIS MANUFACTURING
Emerald Surge Protect ...52
Ruby Surge/Filter ...79

CHECKMATE TECHNOLOGY
MultiView 80/160 ...215
MultiRam IIe w/128k ...169
MultiRam IIe w/256k ...249
MultiRam C w/256k ...269
MultiRam C w/512k ...329

KENSINGTON MICROWARE
System Saver Fan, II+, //e ...65

KOALA TECHNOLOGIES
Koala Pad Plus w/sft. //e, //c ...69
Muppet Learning Keys w/SFT for //e, //c ...55
Gibson Light Pen ...149

MICROSOFT
SoftCard II ...279
Premium SoftCard //e ...269

MICROTEK
Dumpling-GX ...79
Magnum 80me 80 Col 64K for //e ...115

MITSUBA
80 Col. w/64K, //e ...$ 89

ORANGE MICRO
Grappler +, II+, //e ...89
Buffered Grappler +, II+, //e ...149
Bufferboard II+, //e (Spec. your Interface) ...79
Serial Grappler +, II+, //e ...89
Bufferpak ...115
Bufferpak/Ser. Grappler Combo ...179
Orange Interface, II+, //e ...59
Hotlinks for //c ...65
Grappler C for //c ...99

PRACTICAL PERIPHERALS
GraphiCard (Graphics int.) ...79
PrinterFace ...59
SeriALL (RS 232) ...109
Switchport for //c ...89
Pro Clock (spec II+, //e,//c) ...109
Microbuffer II, spec. printer
16K spec. par/ser ...99
32K spec. par/ser ...115
Microbuffer II+ (both par & ser)
16K ...135
32K ...145
64K ...165
Microbuffer In-Line External
32K (spec. par/ser) ...189
64K (spec. par/ser) ...219
128K (spec. par/ser) ...259
256K (spec. par/ser) ...289
Microbuffer/E Internal for Epson Printers
16K Parallel ...115
32K Parallel ...135
64K Parallel ...175
8K Serial ...115
16K Serial ...125
32K Serial ...145
DES 2000 Data Encryption System ...299

QUADRAM
eRam 80 (80 Col, 64K, //e) ...109
Multicore w/OK II+, //e ...179
Multicore w/256K ...299
Ext. Multi function Card for II+, //e ...189
Pro Dos Clock/cal II+, IIe ...75
Buffered Serial Adapter 64K, II+, //e ...119

SUNCOM
II+/IIe Joystick Adapter ...5.75

TITAN SYSTEMS
64K Ram Card ...159
128K Ram Card ...199
Accelerator //e, II+, //e ...219

VIDEO 7
RGB Adapter for, //c ...105
RGB 80/64 for //e ...135
Slot 7 RGB II+, //e ...119

VIDEX
Ultraterm (132 Col) ...199
Lower Case Chip ...25
Visicalc Preboot ...45
Apple Writer II Preboot ...22
Ult. Visicalc Preboot ...54
Ult. Applewriter Preboot ...24

WICO
SmartCard w/Mouse (specify II+ or //e) ...149
SmartCard w/Ball (specify II+ or //e) ...149

HARDWARE for MACINTOSH

KENSINGTON MICROWARE
Surge Protect ...45
Starter Pack ...79

KOALA TECHNOLOGIES
MacVision Digitizer ...179
MacKAT ...149

MICROSOFT
Macenhancer ...189

MITSUBA
Disk Drive for Mac (Year Warranty) ...259

MOUSE SYSTEMS
A+ Optical Mouse (//c, Mac) ...89

NOVATION
Smart Cat Plus 1200 Baud w/SFT ...299
2400 Prof. Modem w/SFT ...519

PROMETHEUS
Promodem 1200 w/MacPac ...349

VERBATIM
SS DD Box of 10 ...26.95

VIDEO 7
Mousestick ...55.95

PRINTERS

C-Itoh
7500 Dot Matrix ...249

COMREX (Div. of Epson)
CR-//e (Same as Brother HR-15XL) Spec par/ser ...299

EPSON ...CALL

NEC SPINWRITER ...CALL

OKIDATA ...CALL

PANASONIC ...CALL

SILVER REED
EXP-400 Par ...229
EXP-400 Serial ...239
EXP-500 LQ (spec.Par/Ser) ..309
EXP-550 LQ (spec.Par/Ser) ..419
EXP-770 LQ (spec.Par/Ser) ..699

TOSHIBA
P1340 LQ (spec.Par/Ser) ...559
P351 LQ, Par ...1199
P351 LQ, Par & Ser ...1229
P351 Bi-Direct Tractor ...159
P351 Auto Sheet Feeder ...579

MONITORS

AMDEK
V300 Green ...132
V300A Amber ...139
Color 300 (Comp) ...235
Color 500 (RGB Comp) ...339
Color 600 Hi/Res RGB ...409
Color 700 ...449
Color 710 Super Hi, RGB ...499

PRINCETON GRAPHIC .CALL

ROLAND
CC-121 12" RGB Hi/Res ...439
RGB Card (Spec. II+ or IIe) ...99
MB-121 Comp. (Spec. Green or Amber) ...135

ZENITH
ZVM-123A 12" Green ...99
ZVM-122A 12" Amber ...99
ZVM-133 Hi/Res 13" RGB ...375

MODEMS

HAYES
Smartmodem 300 ...145
Smartmodem 1200 ...385
Smartmodem 2400 ...619
Micromodem //e w/SFT ...145
Smartmodem 300 w/SFT for //c ...165

NOVATION
Apple CAT II ...189
212 Apple Cat Upgrade ...219
212 Apple Cat System ...349
Expansion Module ...29.95
J-CAT ...89

PROMETHEUS
Promodem 1200 Ext. ...299
Promodem 1200A w/Software for II+, //e ...289
Transportable Promodem 300C for //c ...149

ZOOM TELEPHONICS
Zoom Modem //e Apple ...125
Zoom Modem //e Plus ...139

DISKETTES

BONUS
SS DD Box of 11 ...14.95

MAXELL
SS DD Box of 10 ...19

VERBATIM
SS DD Box of 10 ...18.95
DS DD Box of 10 ...23.95
Disc Drive Analyzer ...29.95
Disc Drive Head Clean. Kit ...8.95
Cleaning Diskettes - 10 ...32

CABLES & RIBBONS
...PLEASE CALL!

SOFTWARE
...PLEASE CALL!

Please call for CURRENT LOW PRICES!

1-800-548-8244 (Orders Only)
312-810-0037 (Customer Service & Order Status)
312-355-9726 (Illinois Orders & Information Requests)

Hours: Mon - Fri 8:30 - 5:30, Saturday 10 - 4

Micro City

A Division of Pace Systems, Inc.
P.O. Box 571
Downers Grove, IL 60515

Check, money order, Visa, MasterCard or American Express (include # & exp. date). $2.50 shipping & handling in Continental U.S. (Alaska, Hawaii & foreign add 5%, min. $5.00). Personal/company checks allow 2 weeks. Please add 2% for credit card use. Illinois residents add 6.25% sales tax. **Dealer inquiries invited.** Prices subject to change.
School & corporate P.O.'s welcome.

VISA MasterCard AMERICAN EXPRESS

given player. The subroutine doesn't let SN have the same value as PN (so that the question the computer selects won't be one that that player entered into the data base). It then checks to see if any usable questions are left in the chosen category. If not, the computer displays the message SORRY, NO MORE QUESTIONS ARE AVAILABLE IN THAT CATEGORY.

If any questions are available, the program checks the question array to see if the players have depleted the selected set. If they have, the program generates another SN and repeats the process described. When the computer has chosen a usable set, the program randomly generates the question number (layer), RN, and checks the QA array to determine if the players have used that question.

If the computer has previously selected question RN, the program checks the next question in that category/set by simply adding one to RN and repeating the process. The new value must not be greater than the number of questions in that set. If it is, the program sets RN equal to one, and effectively wraps around to the beginning of the list.

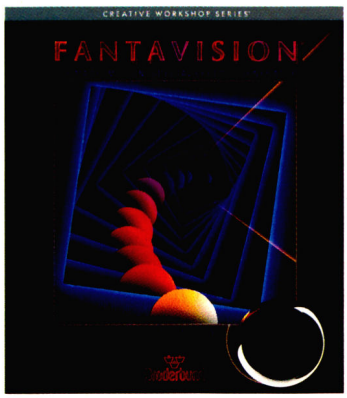
This little procedure, lines 7045–7060, is a very efficient way to generate random numbers from a list so that they won't reappear. The program uses the RND( ) function just once. If you were to use the RND( ) function each time you hit an unacceptable choice, your program would bog down toward the end while it searched for the few remaining numbers allowed. With this routine, if you generate an unacceptable random number, you simply look at the next one until you encounter an acceptable number.

Conclusion

The Trivial Trivia program provides a basis for a working game that requires extensive disk I/O. To this skeleton you can add many more aesthetic elements to enhance the appearance of the scoreboard, menu displays, and question/answer display routines. Tinker with the program; study the code and change it, add to it, improve it. The best way to learn BASIC, once you know the fundamentals, is to play with it, and Trivial Trivia can provide a springboard for hours of enjoyable experimentation. ■

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

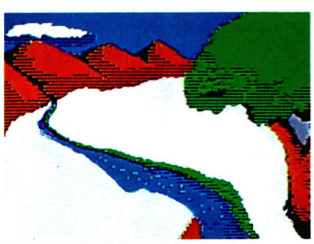
SET YOUR CREATIVITY IN MOTION WITH FANTAVISION,™
THE MAGIC MOTION/SPECIAL EFFECTS GENERATOR.



"It's Alive!"

"TWEENING" will make your animation move in a fluid, lifelike motion. And shadowing is virtually automatic.

YOU CAN create weird monsters by simply dragging circles around the screen, and using one of the special effects modes.



YOU DON'T HAVE TO be an artist to create vivid Backgrounds for your movies. Fantavision's automatic features make it easy.

IMAGINE how much fun it would be to take a simple drawing and make it come alive, dancing across the screen of your computer.

To draw an egg, and transform it into a fire-breathing dragon.

To invent weird characters and strange, alien worlds.

Then, to combine all this into your own incredible cartoon or movie.

Now, imagine if you could do all that as easily as pressing a button.

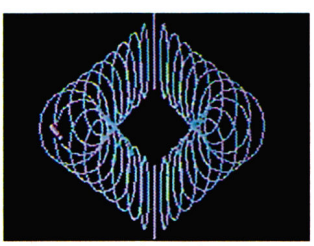
Know what? With Fantavision, you can.

FANTAVISION IS A REVOLUTIONARY SOFTWARE BREAKTHROUGH that, for the *first* time, brings to home computers the special powers known to computer animators as "tweening" and "transforming."

You don't need any artistic ability or computer programming skills. Anything you draw in one frame can be fluidly "transformed" into something else in the next frame. For example, draw a plane in the air in your first frame, and a plane on the runway in your second frame. With Fantavision, your computer can instantly generate—in real time—up to 64 "in-between" frames so that your plane appears to come in smoothly for a realistic, three-point landing.

WHEN YOU SEE THE MAGIC of Fantavision, you won't believe it. When you play with it, you won't be able to stop.

YOU CAN even add Text with Fantavision, and with a single stroke make it "Lean," "Flip," "Squash," "Zoom," or parade around the screen, just like you've seen on television.



IT TAKES ONLY a few simple steps to create intriguing three-dimensional effects.

LOAD HI-RES SCREENS from other programs to make spectacular Backdrops. Then, add your own animation and Text.

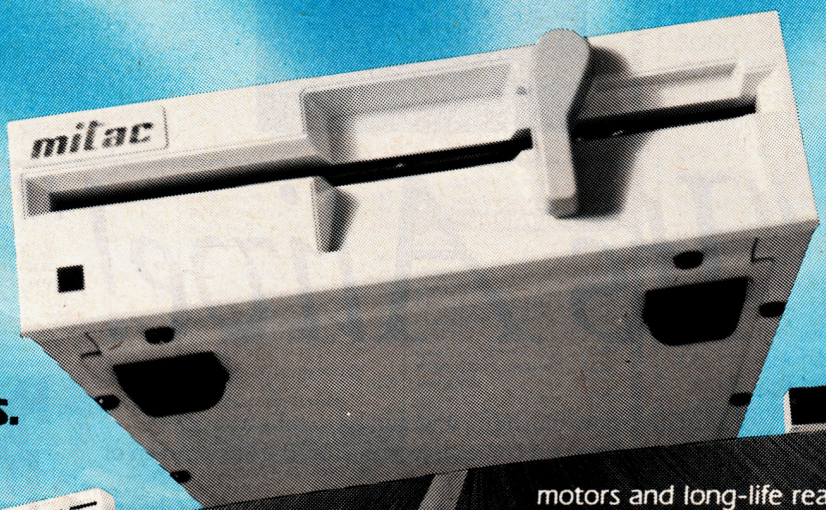
Brøderbund®

FANTAVISION is available for Apple personal computers. Look for it at your favorite Brøderbund Software dealer. For more information about Brøderbund products, please write us at 17 Paul Drive, San Rafael, California 94903-2101. Apple is a registered trademark of Apple Computer, Inc. © 1985 Brøderbund Software, Inc.

Circle 211 on Reader Service Card.

MITAC AD-3C.

The leader in high performance drives.



FOR ALL APPLE®II SERIES COMPUTERS.

In the crowded field of second disk drives for the Apple®II series computers, one drive stands out as leader of the pack — the MITAC AD-3C.

The AD-3C is MITAC's high performance, half-height drive that comes with cable connections to perfectly mate either the IIc or the II/II+/IIe. There's even a special adaptor to convert a IIc drive to fit the IIe.

Like world class racing cars, the AD-3C is built under exacting standards to be rugged and reliable. It boasts such advanced features as fast-start DC brushless direct drive motors and long-life read/write heads.

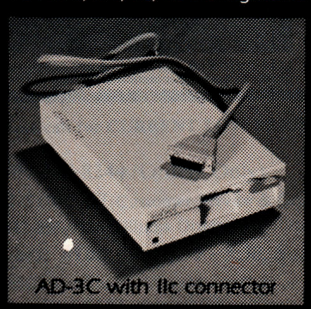
When it comes to performance, nothing overtakes the AD-3C.

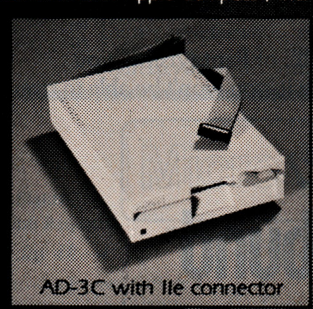
And the AD-3C doesn't get beat out in the price competition, either. In fact, when it comes to quality and price, the AD-3C stands alone in the winner's circle.

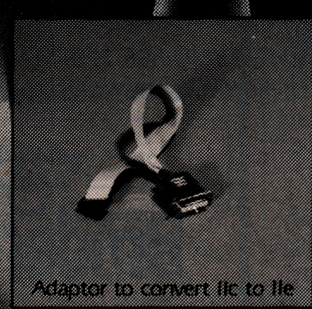
So don't settle for second best and risk getting stuck in the pack. Zoom out front with the MITAC AD-3C.

American MITAC Corp.
3385 Viso Court
Santa Clara, CA 95054
(408) 988-0258

APPLE II/II+/IIe/IIc are registered trademarks of Apple Computer, Inc.


AD-3C with IIc connector


AD-3C with IIe connector


Adaptor to convert IIc to IIe

mitac

Circle 75 on Reader Service Card.

ASK INCIDER

by Bob Ryan,
inCider Technical Editor

If you have a question, our technical editor has the answer. Send your queries about Apple computing to Bob Ryan, Ask inCider, *80 Pine Street, Peterborough, NH 03458.*

Math Strings

Dear *inCider*:

Could you please examine the following program? I've encountered some problems with it:

```
10 INPUT G$
15 G = VAL(G$)
20 PRINT G
```

When I enter the expression 2 + 3 into G$, at line 10, the printed result in line 20 is 2, instead of 5. Why does this happen? Is there any way I can get the computer to accept a mathematical expression when it prompts me for input?

Albert Lu

Dear Albert:

To enter a mathematical expression via an INPUT statement, you have to either tokenize the input string and modify your program as it runs, or parse the input string to separate the values from the operators. Unless you're very familiar with Applesoft's tokenizing process, I recommend you stick to the second method.

Don't expect the VAL statement in your program to do more than it's designed to do. VAL statements scan a string or string variable and convert all characters, up to the first nonnumeric character, to their corresponding numeric values. In your example, with G$ = 2 + 3, the VAL statement scans the string from left to right until it hits the first nonnumeric character—the plus sign (+). Then it converts anything to the left of this character to the value stored in G, and printed in line 20.

You have to separate the numbers from the operator to enter a simple expression like 2 + 3. Using the Applesoft MID$ function, you can scan the input string for operators that divide numbers, store separate numbers in separate variables, and perform operations on the variables based on the operators. Let me demonstrate this process:

```
10 INPUT G$
15 L = LEN(G$): FILL$ = "":COUNT = 0
20 FOR X = 1 TO L
25 TEST$ = MID$(G$,X,1)
30 IF TEST$ < "0" OR TEST$ > "9"
   THEN 45
35 FILL$ = FILL$ + TEST$
40 GOTO 70
45 COUNT = COUNT + 1
50 IF COUNT = 1 THEN VAR1 = VAL(FILL$)
55 IF COUNT = 2 THEN VAR2 = VAL(FILL$)
60 FILL$ = ""
65 OP$ = TEST$
70 NEXT X
80 IF OP$ = "+" THEN G = VAR1 + VAR2
85 IF OP$ = "-" THEN G = VAR1 - VAR2
90 IF OP$ = "*" THEN G = VAR1 * VAR2
95 IF OP$ = "/" THEN G = VAR1/VAR2
100 PRINT G
```

This is a bare-bones routine—it won't handle more than two numbers and one operator, it won't check for an "E" that could be part of a number, and it won't trap input errors. But it will give you an idea of how to parse an input string for numeric expressions.

Voluminous Changes

Dear *inCider*:

Can you recommend a quick method for changing the volume number of a DOS 3.3 disk once the disk has been formatted and filled with files?

John M. Klein
4023 Oxhill Road
Spring, TX 77388

Dear John:

I suggest you use a byte-zap utility to change the volume number of the disk. The volume number is contained on track 17 ($11), sector zero, byte 06.

80-Column Help

Dear *inCider*:

I'm a beginner in assembly language, and I'm having trouble making a machine-language subroutine work correctly from one of my BASIC programs. I'm using the subroutine to print messages from my BASIC program to my monitor. The routine works fine in 40 columns, but in 80-column mode, it puts a space between the letters of the message. None of the books I have on machine/assembly language covers this. Can you refer me to any documentation?

Jim Ashford
75 Laiki Place
Kailua, HI 96734

Dear Jim:

The IIe Reference Manual *and the* 80-Column Text Card Manual *should help. These two books explain how to activate and deactivate your 80-column card correctly.*

Out of Control

Dear *inCider*:

I've been working on a large program and using control characters in the file name to partially copy-protect it. Since a few of the control characters are control-J's, the line-feed character, I can't simply move the cursor over the file name in the catalog listing. Is there any way to find out the control characters in my file name?

John May
2001 South 12th Street
Charleston, IL 61920

Dear John:

You'll find a routine to display control characters in a file name on page 151 of the DOS Manual, *and page 33 of the* DOS Programmer's Manual, *both published by Apple Computer. This routine won't reveal a control-H, control-M, control-U, or escape. If that doesn't solve your problem, you'll*

LET THE KITCHEN PLANNER™ DO IT!

In less than 5 minutes, **KITCHEN PLANNER** will help you plan up to 14 days of balanced meals the way YOU want them and print the Menu and Shopping List.

★ EASY TO USE ★ SAVES TIME ★
★ SAVES MONEY ★

- **"Saves 5-6 hrs a month and keeps our meals varied."** - Family Computing Magazine Cover Story, November 1984.
- **"The concept of this program is great for my family . . . I have only owned the program for 3 weeks and our shopping expenses have been reduced by about $25 a week . . . that's great!"** - Mrs. S., Illinois
- **"This has been without a doubt the most useful disk I have purchased for my home computer."** - Mrs. T., Wisconsin

SATISFACTION GUARANTEED

Send Check or Money Order to:
SAV-SOFT PRODUCTS
P.O. Box 24898
San Jose, CA 95154
$29.95
(add $1.50 handling; in CA add 6½%)
VISA,MC call : (408) 978-1048
48K Apple II, II+, IIe, IIc, 1 disk, printer
Apple is a trademark of Apple Computer, Inc.

Circle 223 on Reader Service Card.

And your Earls and Viscounts. If you've got royal ancestors, we have the noble software that can help you trace them down.

Family Roots and your Apple, IBM, Commodore, Kaypro*, and many others, offer individual and group sheets, charts, name indices, general search and text capabilities. Adapts to most disk drives, printers, and screens. You get more utility programs, plus lots of personal control. A comprehensive (new) manual is included.

Put up your dukes!

All for just $185.

Write or call today for more information and a free brochure.

Quinsept, Inc.
P.O. Box 216
Lexington, MA 02173
(617) 641-2930

American Express, Visa, and MasterCard gladly accepted.

Family Roots™

* *Trademarks for Apple Computer Inc., International Business Machines, CBM, Inc. and Digital Research.*

THE PLAYWRITER SERIES
GREAT AMERICAN WRITING CONTEST

WIN OVER $1,000 IN PRIZES

PLUS publication and distribution of your book

PLUS "new author treatment" including multimedia attention

PLUS a computer for your school or library

EVERY ENTRANT WINS A PRIZE!
NO PURCHASE NECESSARY!

Contest Sponsors Include: D.C. Comics, Grolier Electronic Publishing, Run, InCider, and Instructor Magazines

Grand prize winners will be selected in 3 age categories: **Adventures in Space** (Grades 4 and below), **Castles & Creatures** (Grades 5-6), **Mystery!** (Grades 7-12).

EASY TO ENTER: Use PlayWriter – the new computer-assisted writing software series – to write and edit your story. Print it onto PLAIN PAPER. Send your **un-illustrated** story and the completed entry blank below to **Woodbury Software.** (DO NOT SEND HARDCOVER BOOKS.) All entries become the property of Woodbury and will not be returned. Entries must be postmarked by January 31, 1986.

Entries will be judged on the basis of: Content, Originality, Grammar, Spelling, Overall Effect. Decision of the judges is final.

Send to **Woodbury Software**
127 White Oak Lane, CN 1001
Old Bridge, NJ 08857

Name _____

Address _____

City _____

State, Zip _____

Phone _____ Grade _____

Sponsoring School _____
(if applicable)

Sponsoring Library _____
(if applicable)

probably need to use a byte-zap utility to correct the file name as it appears on disk. Refer to Beneath Apple DOS, *from Quality Software, 21601 Marilla Street, Chatsworth, CA 91311, to find out how you can alter file names on disk.*

Do-It-Yourself Pre-Boot

Dear *inCider*:

I recently purchased Peachtree Software's Inventory System, which I run on my //e with Applied Engineering's Z-80 Plus card, CP/M 4.0, and an Epson FX-80 printer. The program works fine, except that I can get only 80-column output from my printer, not the 132-column output the program requires. Is there a way to format my CP/M program to print 132 columns of type?

Ed Snyder
16032 Mariner Drive
Huntington Beach, CA 90264

Dear Ed:

I've never used Peachtree's Inventory System, so I don't know if you can modify the program to get 132 columns on your printer. I don't think you need to alter the software, though. You just need a pre-boot that will put your printer into 132-column mode before you boot CP/M.

First, boot a DOS 3.3 disk. Then turn on your printer, and, assuming your printer is connected to slot 1, type in PR#1. Finally, type in the following two lines from the keyboard:

```
PRINT CHR$(27);"P"
PRINT CHR$(15)
```

Remove the DOS disk and boot CP/M. Your printer will now work in condensed mode until you send it new control codes, or until you turn it off.

The Dating Game

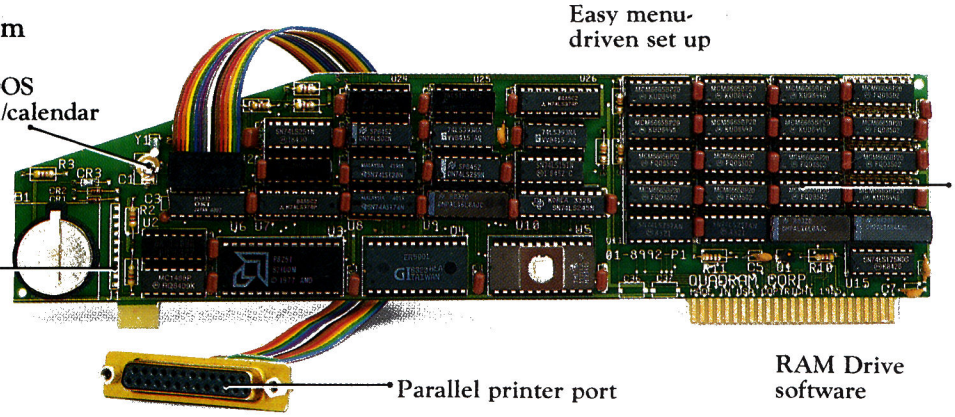
In response to "Date-Stamping ProDOS Files" in the September 1985 Ask inCider *(p. 120), a number of readers sent in BASIC programs that set the date under ProDOS. For the most part, they felt the manual method was educational, but the whole process is a lot easier if you let a program do it. If you'd like copies of these routines, send a self-addressed, stamped envelope to:*

Bob Ryan
ProDOS Date
80 Pine Street
Peterborough, NH 03458

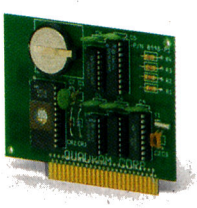
Quadram Enhances Apples!

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.

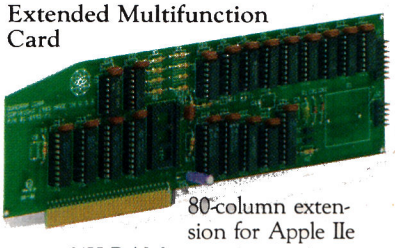
Multicore by Quadram



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

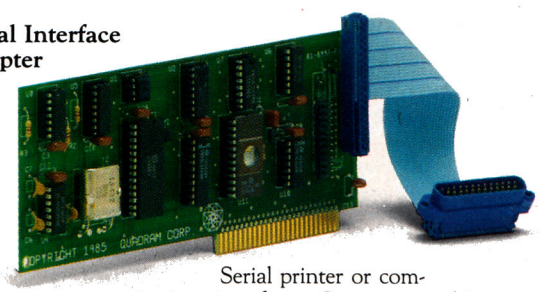


Extended Multifunction Card



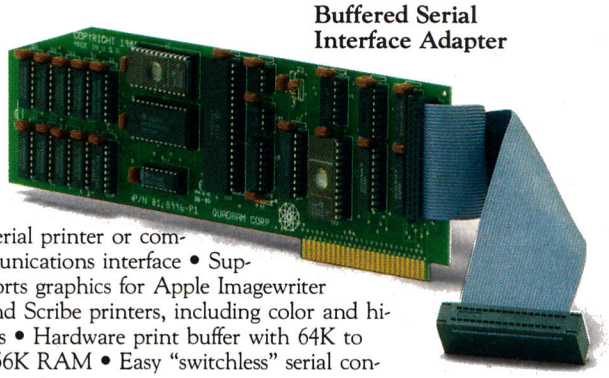
80-column extension for Apple IIe • 64K RAM expansion option • Color RGB interface • ProDOS clock/calendar.

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.

Buffered Serial Interface Adapter



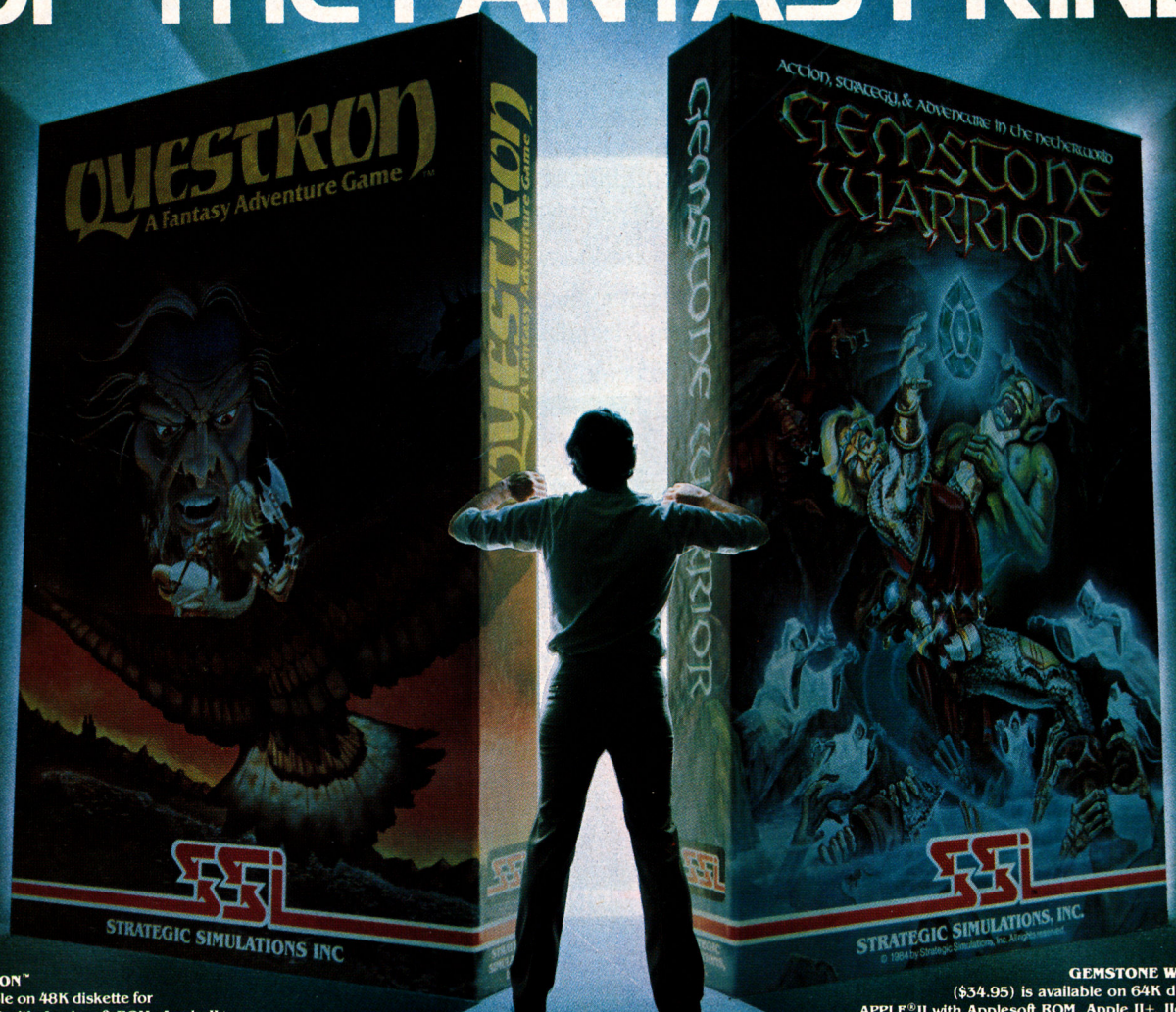
Serial printer or communications interface • Supports graphics for Apple Imagewriter and Scribe printers, including color and hires • Hardware print buffer with 64K to 256K RAM • Easy "switchless" serial configuration.

Apple, Apple II, Apple IIe, Apple Imagewriter, and Apple Super Serial Card are trademarks of Apple Computer Corp. Quadboard, eRAM 80, APIC, and Multicore are trademarks of Quadram Corp. Scribe is a trademark of Scribe, Inc.

QUADRAM™
An Intelligent Systems Company

Circle 234 on Reader Service Card.

CLOSE ENCOUNTERS OF THE FANTASY KIND



QUESTRON™
is available on 48K diskette for APPLE®II with Applesoft ROM, Apple II+, IIe, and IIc ($49.95).
On 40K diskette for ATARI® home computers ($49.95).
On 64K diskette for COMMODORE 64™ ($39.95).

GEMSTONE WARRIOR™
($34.95) is available on 64K diskette for APPLE®II with Applesoft ROM, Apple II+, IIe, and IIc.
On 128K and 512K diskette for MACINTOSH®.
On 48K diskette for ATARI® home computers.
On 64K diskette for COMMODORE 64™.

QUESTRON™. *A role-playing game so spell-binding, it suspends reality and conjures up an enchanted world whose only hope against the forces of evil is you.*

GEMSTONE WARRIOR™. *A lightning-fast action strategy game that will leave you breathless with excitement as it takes you through the labyrinths of the Netherworld on a noble quest.*

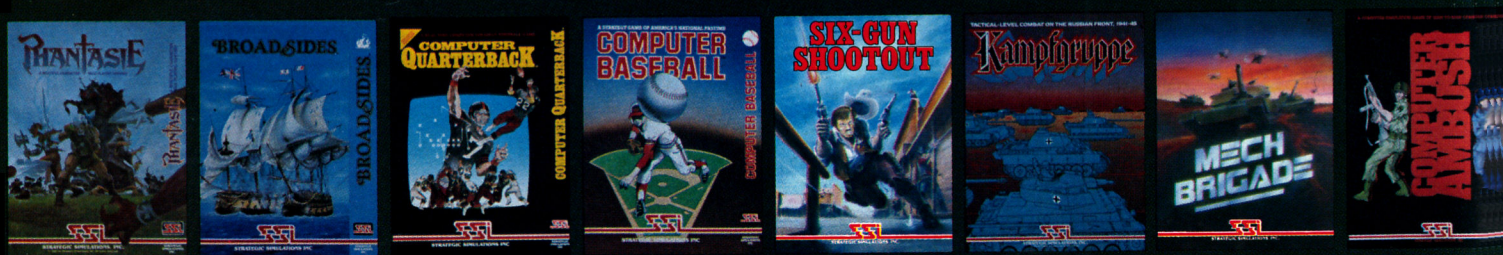
Open them up and step through the gateway to your fantasies. At your local computer/software or game store today.

If there are no convenient stores near you, VISA & M/C holders can order direct by calling **800-227-1617, ext. 335** (toll free). In California, call 800-772-3545, ext. 335. Please specify computer format and add $2.00 for shipping and handling.

To order by mail, send your check to: STRATEGIC SIMULATIONS, INC., 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (California residents, add 7% sales tax.) All our games carry a "14-day satisfaction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES.

© 1985 by Strategic Simulations, Inc.
All rights reserved.



APPLE/MACINTOSH, ATARI and COMMODORE 64 are trademarks of Apple Computer, Inc., Atari, Inc., and Commodore Electronics, Ltd., respectively.

Circle 160 on Reader Service Card.

Please don't send a disk—I'll only supply copies of the listings. I would like to thank Larry Perkins, Earl Hart, and inCider *contributors Harold Portnoy, Paul Van Bloem, and William Miller for sharing their routines with me (and you).*

Speaking of ProDOS date-stamping, Mary Kurzeka of Practical Peripherals, 31245 La Baya Drive, Westlake Village, CA 91362, informs me that her company is producing an internal clock for the //c. The clock is ProDOS-compatible and provides automatic time- and date-stamping and, as a bonus, text and graphics screen dumps. It seems like a nice addition to a //c. I'm beginning to wonder if it's still accurate to call the //c a "closed" system.

FORTRAN Forever!

Dear *inCider*:

I have an Apple //e computer and Apple Pascal. I would like to use FORTRAN. Is there any way I can run FORTRAN without having to buy a CP/M board?

Albert Kim

Dear Albert:

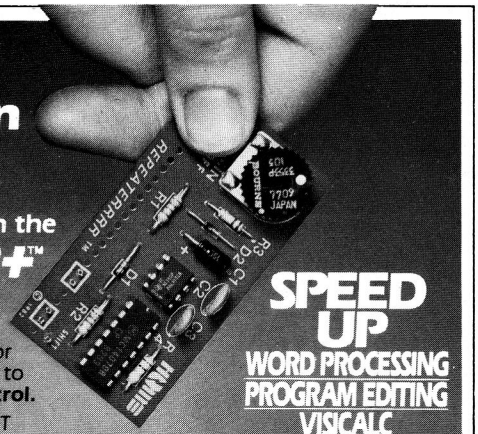
Since you already own the Apple Pascal system, you only need to buy a FORTRAN compiler from Apple to run FORTRAN. Apple FORTRAN uses the same operating system (the UCSD p-system) as Apple Pascal. Look for it at your Apple dealer.

PR# Update

In the May 1985 Ask inCider, *Robert Bartholemew wrote about his problems with using DOS commands in a program that used PR# commands. I advised him to be sure that a carriage return preceded each DOS command. Carson Eddy, a reader from South Bend, Indiana, recommends you use the PR# and IN# commands as DOS commands instead of Applesoft commands—for example, 100 PRINT CHR$(4) "PR#1" instead of 100 PR#1.*

If this affects the format of your output, you can use the Applesoft PR# and IN commands as long as you reconnect DOS with an immediate CALL 1002. Thanks for the reminder, Carson.■

UPGRADE
get //e features on your apple II



up to 5 keyboard features with the
REPEATERRRR+™

SPEED UP
WORD PROCESSING
PROGRAM EDITING
VISICALC

Auto Repeat: Invaluable. Repeats any keypress, including control characters for scrolling, rubout, etc. **Adjustable delay** to match your typing touch. **ON/OFF control.**

High Speed Cursor: Makes Apple's REPT key a speed control to double the repeat rate of any keypress. Zip through text or across a VisiCalc spreadsheet to get there fast. A must for 80 column displays.

New option for the REPEATERRRR:
SHIFT-key Modification: SHIFT as you should. Get the "standardized" connection (SHIFT-key to Game I/O) while leaving the Game I/O open with our plug-in connector. Supported by most popular word processors (Apple Writer II, Word Handler, Screen Writer II, etc.) and many other programs. Works only with certain software and/or most 80 column boards.

Easy installation. Open top and plug onto 25-pin connector between keyboard and encoder board (fits Rev .7 or later).

REPEATERRRR
without SHIFT-key modification $37.95

REPEATERRRR+
with SHIFT-key modification $47.95

TO ORDER: Ask your local dealer or order direct.

Add $2 per order shipping/handling ($5 foreign). Ohio orders add 6.5% sales tax. Check, MasterCard VISA (incl. card no. & exp. date). 30 day trial — full refund if not satisfied. One year warranty.

HOME
HIGH ORDER MICRO ELECTRONICS CORP.
17 RIVER ST. CHAGRIN FALLS OHIO 44022
PHONE 216-247-3110

Trademarks: Apple/Apple Computer, Inc., Screen Writer II/Sierra On-Line, Inc., Word Handler/Silicon Valley Systems Inc., VisiCalc/VisiCorp.

INTRODUCING: AN INTELLIGENT CHOICE
intec 300/1200 MODEM
A FULL FUNCTION EXTERNAL MODEM PACKAGE

INCLUDED WITH INTEC MODEM:
- Communications Software
- Auto-Dial • Bell 103/212A Compatible
- RS-232 Cable [Super Serial Card Configuration]
- Phone Cable
- Compatible with ASCII Express™

$199.00 Suggested Retail Price
Call for Special Christmas Discount

APPLE™ INTEC 300 MODEM PLUG-IN CARD INCLUDES:
- Communications Software
- Auto-Dial / Auto-Log On / Unattended Answer Mode
- Full Year Warranty
- ASCII Express Software Driver [Apple™ IIc Version Release 4.20]

$109.95 Optional Bulletin Board Software — $29.95

INCLUDED WITH BOTH MODEMS:
- Free DELPHI™ Membership ($29.96 value), 1-hour free time
- 25% Discount on EASYNET™ First 90 Days

intec corporation

Dealer Inquiries Invited
21751 West Nine Mile Rd.
Southfield, MI 48075
(313) 352-0066

Circle 191 on Reader Service Card.

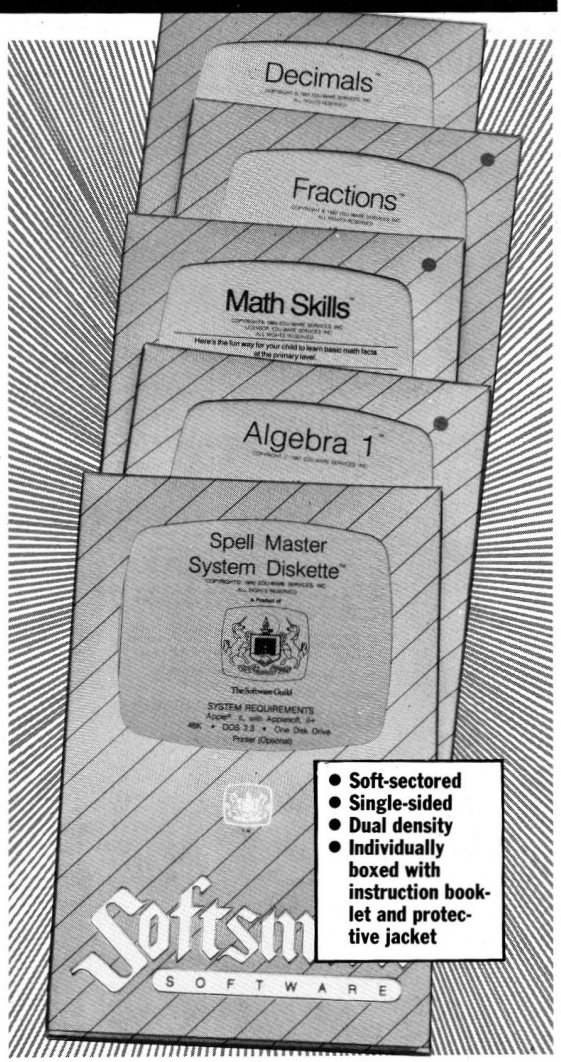
BANKRUPTCY COMPUTER

FACTORY NEW! FIRST QUALITY!

For APPLE Computers at 50% to 80% OFF!

Enjoy BIG SAVINGS on high-quality software for BUSINESS, EDUCATION, HOME MANAGEMENT, COMPUTER MANAGEMENT and exciting VIDEO GAMES!

SOFTSMITH, a leading manufacturer of excellent quality software, was forced into bankruptcy due to intense competition. We are authorized to liquidate this bankruptcy inventory at BIG SAVINGS! Programs are designed for use with Apple II, II+ or IIe computers. (See individual descriptions for requirements.)



- Soft-sectored
- Single-sided
- Dual density
- Individually boxed with instruction booklet and protective jacket

EDUCATION

Mfr. Suggested Retail $29.95 and up

NOW ONLY... $10 Ea.

Shipping, handling: $3 ea.

COLOR ME. Item H-687-63542-04. Introduces youngsters to exciting world of computer graphics, colors, textures. Enhances artistic creativity with 25 different pictures and 32 colors to choose from. Ages 5 to 12. Requires: Apple® II, II+, IIe; 48K; one disk drive; two paddles or joysticks; color monitor.

PERCEPTION. Item H-687-63542-09. Seven programs in one! Helps improve visual perceptive skills such as comparing shapes, sizes, lengths and hand/eye coordination. Requires: Apple® II with Applesoft II+, IIe; 48K; DOS 3.3; one disk drive; paddle controllers.

WORD SEARCH. Item H-687-63542-19. For creating and printing word search puzzles. Helps beginning readers find and indentify words. Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; one disk drive; printer.

ALGEBRA I. Item H-687-63542-01. Helps beginner review student master basic concepts in algebra, consisting of properties and equation operations. Includes: Definitions, Number Line Operations, Sets, Evaluating Expressions and Rules for Equations Reduction. Requires: Apple® II, II+, IIe; 48K RAM Applesoft; DOS 3.3; one disk drive.

ALGEBRA III. Item H-687-63542-02. Learn algebraic concepts. Five lessons: Monomials, Polynomials, Factoring, Factoring and Binomials and Quadratic Trinomials. For self-paced study. Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; one disk drive; color monitor (optional).

SOLD OUT

STATISTICS. Item H-687-63542-03. A generalized statistics system. Six programs: Mean, Variance and Standard Deviation; Correlation Coefficient; Normal Distribution; Chi-Square Test; Chi-Square Distribution; and T-Test. Requires: Apple® II, II+, IIe; 48K; DOS 3.3; one disk drive; printer (optional).

CON-PUTATION. Item H-687-63542-05. Learn basic math by making a match and scoring a point in this game of concentration and calculation. Music and graphic displays. Requires: Apple® II with Applesoft, II+, IIe; DOS 3.3, 48K; one disk drive.

DECIMALS. Item H-687-63542-06. For primary level education. Entertains while it teaches and challenges child for learning. Can be customized to suit special needs of working with decimals. All kinds of arithmetic. Requires: Apple® II with Applesoft, II+, IIe; 48K RAM; DOS 3.3; one disk drive.

SOLD OUT

FRACTIONS. Item H-687-63542-07. Teaches addition, subtraction, multiplication, and division of fractions. Can be customized to fit child's needs and learning pace. Requires: Apple® II with Applesoft, II+, IIe; DOS 3.3; one disk drive.

MATH SKILLS. Item H-687-63542-08. Provides primary level instruction in basic arithmetic. Interactive format, animated pictures, captivating sounds. Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3, one disk drive.

THE BIG MATH ATTACK. Item H-687-63542-17. A game-like educational program for primary school children to learn and perfect basic addition, subtraction, multiplication, division skills. Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; one disk drive.

VOLCANOES. Item H-687-63542-17. Sophisticated game for older children and adults. Comprises an introductory course to volcanic processes. Requires: Apple® II, II+, IIe; 48K RAM; Applesoft; one disk drive; DOS 3.3.

SPELL MASTER. Series of lessons with hundreds of commonly misspelled words, geared to a particular grade in school (4 through 6). Plus an adult disk with words from a secretarial handbook! Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; one disk drive; printer (optionall).

Spell Master grades 4, 5, 6, plus controller disk. Item H-687-63542-66

Spell Master grades 7, 8, Adult, plus controller disk. Item H-687-63542-67

Liquidation price for set of three ..... $24 per set

BUSINESS

Mfr. Suggested Retail $49.95 and up

NOW ONLY... $24 Ea.

Shipping, handling: $3 ea.

ACCOUNTS PAYABLE. Item H-687-63542-20. Maintain purchase and cash disbursement journals, add vendor accounts, print journals and reports, keep track of vendor purchases and overall accounts payable. Requires: Apple® II with Applesoft, II+; 48K; DOS 3.3; two disk drives; 132 column printer.

SOLD OUT

GENERAL LEDGER. Item H-687-63542-22. Provides your business with a complete and easy-to-use computerized ledger. Requires: Apple® II with Applesoft, II+; DOS 3.3; two disk drives; 132 column printer.

OPTIONX. Item H-687-63542-23. Analyzes historical data, recent events and your projections through sophisticated proven equations. Aids in assimiliation and/or interpretation of statistical information pertaining to securities transactions. Requires: Apple® II with Applesoft, II+; 48K RAM; DOS 3.3; one or two disk drives; printer (optional).

WORDSMITH. Item H-687-63542-24. Word processing system provides editing formatting and printing features. Requires: Apple® II, Apple II+; 48K RAM; DOS 3.3; one disk drive.

PAYROLL. Item H-687-63542-25. For small business payroll bookkeeping needs. Requires: Apple® II with Applesoft, II+; 48K; two disk drives; 132 column printer.

LIST MASTER. Item H-687-63542-26. Easy, flexible program for managing large lists. Requires: Apple® II, II+; 48K RAM; DOS 3.3; at least one disk drive; printer (optional).

DINNER ON A DISK. Item H-687-63542-50. Computerized cookbook of recipes. Press button and any of dozens of recipes appears on screen. Another press, and you have a copy of recipe to take to the store or give to a

LIQUIDATION! SOFTWARE!

friend. Requires: Apple® II, II+; 48K RAM; Applesoft; DOS 3.3; one disk drive; printer (optional).

DRINKS ON A DISK. Item H-687-63542-51. Computerized book of drinks! 100 different drink recipes to choose from at press of a button! For printout, press another button! Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; one disk drive; printer (optional).

HOME MANAGEMENT and COMPUTER MANAGEMENT

Mfr. Suggested Retail $29.95 and up

NOW ONLY... $10 Ea.

Shipping, handling: $3 ea.

ROOTS/M. Item H-687-63542-53. Help trace your family's heritage by organizing family tree information. Go back 99 generations! Requires: Apple® II, II+, IIe; 32K; two disk drives; **80 column card; Microsoft CP/M card;** printer (optional).

CONDOR I. Item H-687-63542-27. Microcomputer database available for information processing, inventory control, mailing lists, accounting functions, personnel management, customer orders and more. Requires: Apple® II, II+; 64K; two disk drives; printer (optional); **Microsoft CP/M; 80 column card.**

BUGBYTER. Item H-687-63542-54. Gives you knowledge of computer memory, along with the ability to disassemble, single-step and trace execute, debug, edit, and a host of other conveniences. Requires: Apple® II, II+, IIe; 24K; DOS 3.3; one disk drive; monochrome monitor; game paddle (optional).

DISK DIRECTOR. Item H-687-63542-55. Use this program to manipulate and organize DOS files, filenames, and entire disks. Some capabilities include: restoration of deleted files, special methods of copying, catalog restructuring and disk integrity checking. Requires: Apple® II, II+, IIe; 48K; DOS 3.3; one or two disk drives.

SECUREGUARD. Item H-687-63542-28. Uses a unique "two-key" system to encode and decode text or data. Requires: Apple® II, II+; two disk drives; printer; **CP/M operating system; 80 column card; Z-80 card.**

VIDEO GAMES

Mfr. Suggested Retail $29.95 and up

NOW ONLY... $10 Ea.

Shipping, handling: $3 ea.

POLLYWOG. Item H-687-63542-48. First you're an egg, then a full-grown frog. You play to avoid getting devoured by "orange creepies" and the great white killer fish. Requires: Apple® II, II+, IIe; 1 disk drive; color monitor or TV; joystick.

LAZERSILK. Item H-687-63542-46. You're a Spyder, defending your web from being torn apart. You must outwit a variety of enemy creatures; capture, bundle or shoot them. Beware! They're cunning and deadly! Requires: Apple® II, II+, IIe; 48K; 1 disk drive; DOS 3.3; joystick (optional).

FIREBIRD. Item H-687-63542-42. You're Piggo (fearless firepig), guarding your town from fire. The vicious Firebird races through, leaving the whole town in flames! You must put out flames in buildings, save inhabitants from death. Requires: Apple® II, II+, IIe; 48K; 1 disk drive; DOS 3.3.

CROSS COUNTRY RALLEYE. Item H-687-63542-41. You're selected to test drive a super new Ferrari in a big race. Follow a treacherous course, make 8 checkpoints, return to finish line in record time. 3 "jam cars" try to force you off the track. Requires: Apple® II, IIe; 48K; 1 disk drive; DOS 3.3, joystick, (optional).

THE FINAL FRONTIER. Item H-687-63542-32. Pilot an advanced version of the original NASA shuttle: liftoff, rendezvous, approach and docking with an orbiting space station. Realistic systems will help you, but your piloting skills are vital to success! Requires: Apple® II, II+, IIe; 48K; Applesoft; DOS 3.3; 1 disk drive; joystick (optional).

SOLD OUT

ACEY-DUECY. Item H-687-63542-29. A fast-moving card game. Can make you a billionaire or a pauper in just a single play. Compete with the computer or with your friends. Play odds or intuition. Requires: Apple® II, II+, IIe; 1 disk drive; DOS 3.3.

CONGLOMERATES COLLIDE. Item H-687-63542-30. Manipulate cash, stock, subsidiary companies to survive and prevail in the tough corporate world. Requires: Apple® II with Applesoft, II+, IIe; 48K; 1 disk drive; DOS 3.3; color monitor optional.

MAX-COMMAND. Item H-687-63542-34. Military buildup is taking place between your home country and another major power. Your mission: military defeat of enemy. Requires: Apple® II with Applesoft, II+, IIe; 48K; 1 disk drive; DOS 3.3.

SPACE CONQUERORS. Item H-687-63542-38. You are landing on another planet. Your instruments indicate it is much like the earth. You chose to land, but will face unknown obstacles! Requires: Apple® II with Applesoft, II+, IIe; 48K; DOS 3.3; 1 disk drive; color monitor preferable.

THE PRISONER. Item H-687-63542-39. You ARE the prisoner! With only your intelligence, you must repel the brainwashing of the authorities who are trying to break you down. Can you escape, or will you always be "The Prisoner"? Requires: Apple® II with Applesoft, II+, IIe; 48K; 1 disk drive; DOS 3.3.

LUNAR PINBALL. Item H-687-63542-47. Ding, ring, bing, the ball's in play! All the excitement of planetary pinball in zero gravity playing field. All the sounds of real pinball. Lights blink as score adds up. Add: ten flippers and force field shields! Nothing on earth quite like this! Requires: Apple® II with Applesoft, II+, IIe; 48K RAM; DOS 3.3; 1 disk drive, game paddle.

ASTRO-ATTACK. Item H-687-63542-40. Control rocket ship! Climb, dive, drop bombs! Watch out for ground defenders aiming laser cannons at you! Adjustable difficulty level. Requires: Apple® II, II+, IIe; 48K RAM; DOS 3.3; 1 disk drive.

MIDNIGHT MALADY. Item H-687-63542-35. You're a member of a small medieval village. You wake in the morning with a wound in your arm and hear about a werewolf, and you must find an antidote before full moon rises tonight. Requires: Apple® II, II+, IIe; 48K RAM; 1 disk drive; DOS 3.3.

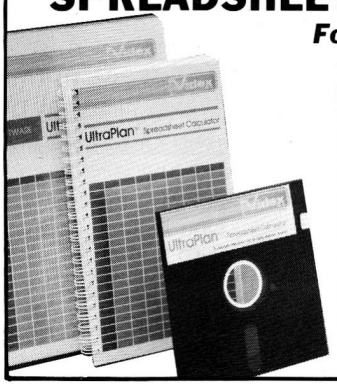
GUARDIAN. Item H-687-63542-43. Year 2112. The sacred "Emerald of Syrinx" is in your care. Because is is so valuable, many would kill you for it. You must protect yourself, the emerald, and get safely through the 6 levels of the Dungeons of Kailyn! Requires: Apple® II, II+, IIe; 48K RAM; Applesoft; DOS 3.3; 1 disk drive; joystick (optional).

RUSSKI DUCK. Item H-687-63542-37. Secret MX missle plans are in enemy hands. You're a special agent and have intercepted a message that reads, "get the duck and leave at midnight." You assume plans are secreted in a duck decoy. You must find them and return them to CIA, avoiding booby traps along the way that can be deadly. Requires: Apple® II, II+, IIe; 48K RAM; DOS 3.3; 1 disk drive.

CREATURE VENTURE. Item H-687-63542-31. You've inherited your rich uncle's mansion. To recieve inheritance, you must rid the mansion of horrible creatures that possess it...and find the buried treasure. Requires: Apple® II, II+, IIe; 48K; DOS 3.3; 1 disk drive; Applesoft ROM.

SPREADSHEET SOFTWARE

For Apple II or Apple IIe



This is **NOT** a bankruptcy item! But it **IS** an inventory **CLOSEOUT** by Videx, the manufacturer. And that's the reason for our extremely LOW price! Ultra Plan Spreadsheet lets you create and modify schedules and reports for a wide variety of needs by turning your computer into a huge mathematical worksheet. 254 rows and 63 columns.

Mfr. List: $99.95
Liquidation Price . . $19
Item H-687-64188-00
Shipping, handling: $4.50

MasterCard

Credit card customers can order by phone 24 hours a day, 7 days a week

VISA

Toll-Free 1-800-328-0609

TeleCheck

Your check is welcome.
No delays in orders paid by check.

C.O.M.B. CO.®/ Liquidator Item H-687
14605 28th Avenue N./Minneapolis, Minn. 55441-3397

Please send the items indicated below. (Minnesota residents add 6% sales tax. Allow 3-4 weeks delivery. Sorry, no C.O.D.)

Item No.	Title	Price	Ship, Hand.

(To order more items, attach a separate list with your name and address on it.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)

Charge my: ☐ MasterCard™ ☐ VISA

Acct. No. _____ Exp. _____

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____ State _____ ZIP _____

Phone _____

Sign here _____

C.O.M.B. CO.®

Authorized Liquidator

14605 28th AVENUE NORTH
MINNEAPOLIS, MINNESOTA 55441-3397

PASCAL PRIMER

Facts on Filer: Part 2

by Tom Swan

Learn how to put text files to work in your Pascal programs.

Pascal files let you communicate with peripheral devices, save data on disk, talk by modem over a telephone line, print program listings, and more. This month, I'll show you how to use files in your own programs. I'll also explain three more commands in the Apple Pascal Filer.

Declaring Files

Although you can have files of any data type, in this column I'll just concentrate on text files. Programs declare file variables in a VAR section. The following lines, for instance, declare two equivalent text-file variables:

```
VAR
    CharFile  : FILE OF char;
    TextFile  : Text;
```

A typical file declaration starts with the key words FILE OF followed by the file's data type. CharFile is what it seems—a file of characters. You can also use the predefined identifier, Text, which means the same thing. After declaring a file variable, open it with RESET. This command takes two parameters—a file variable and a file name—as the line below indicates:

```
Reset( Textfile, 'TEST.TEXT' );
```

The file name must be a literal string (as shown above) or a string variable. For example, your program can prompt an operator to type in a file name, then pass that name to RESET:

```
Write( 'Open what file? ' );
Readln( FileName );
Reset( TextFile, FileName );
```

In the example above, FileName is a string variable. Because the longest possible file name in Apple Pascal contains 23 characters, declare FileName with its maximum length in brackets as follows:

```
VAR
  FileName : string[23];
```

Writing Text Files

Listing 1, Create, lets you type text into a file named TEST.TEXT. Enter, compile, and run the program, then type in lines of text. Press control-C (also known as <Etx>, meaning "end of text") to tell Create you're done.

Line 10 of **Listing 1** demonstrates the use of the end-of-file Boolean function, eof. Eof becomes True when its file parameter reads a control-C or when it reaches the physical end of a disk file. Eof(input), then, is true after you press control-C, which ends the WHILE loop, and therefore, the program.

The REWRITE in line 5 of **Listing 1** creates a new disk file named TEST.TEXT. If a file with that name already exists, Apple Pascal removes the old file from disk, updating the disk directory when you close and lock the new file, as **Listing 1** does in line 15.

Listing 1. CREATE.TEXT.

```
 0: PROGRAM Create;
 1: VAR
 2:     tf : text;
 3:     s : string;
 4: BEGIN
 5:     rewrite( tf, 'TEST.TEXT' );
 6:     writeln;
 7:     writeln( '* Enter lines of text.' );
 8:     writeln( '* Press control-C to quit.' );
 9:     writeln;
10:     WHILE NOT eof( input ) DO
11:     BEGIN
12:         readln( s );
13:         writeln( tf, s )
14:     END;
15:     close( tf, lock )
16: END.
```

Reading What You Write

Reading text files is similar to writing them. **Listing 2** reads and displays TEST.TEXT, the file you just created. When reading an existing file, open it with RESET, as shown in line 5; when creating a new file, use REWRITE.

The WHILE loops in the two listings are similar. In **Listing 2**, the loop reads strings from file tf, writes them to the display until it detects the end of the file, and finally closes the file in line 12. Compare that line with the close in **Listing 1**, line 15. If you don't make any changes to a file, you don't have to lock it in the directory. In fact, because Pascal automatically closes all files when a program ends, you don't need line 12 in **Listing 2** at all. I like to close all files, though, as a standard practice.

Standard Files

As you can see in **Listings 1** and **2**, readln and writeln statements have two forms. In line 9 of **Listing 2**, for example, readln has two parameters, tf and s. But, in line 12 of **Listing 1**, readln has a single parameter, s. What's the difference?

Pascal has two standard files, Input and Output. Unless you specify another file, readln and writeln default to those standards. The following statement pairs, then, are equivalent:

```
readln( s );   readln( Input, s );
writeln( s );  writeln( Output, s );
```

You can specify any text file as the first parameter in readln and writeln

Listing 2. READTEXT.TEXT.

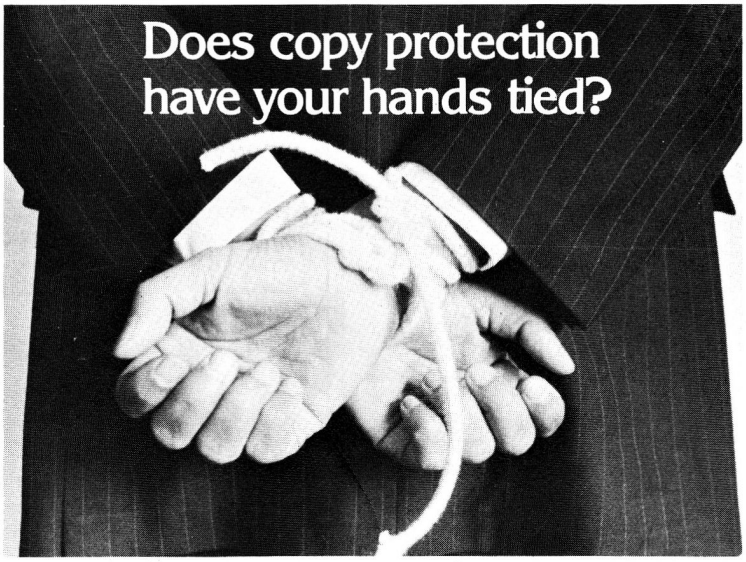
```
 0: PROGRAM ReadText;
 1: VAR
 2:     tf : text;
 3:     s : string;
 4: BEGIN
 5:     reset( tf, 'TEST.TEXT' );
 6:     writeln;
 7:     WHILE NOT eof( tf ) DO
 8:     BEGIN
 9:         readln( tf, s );
10:         writeln( s )
11:     END;
12:     close( tf )
13: END.
```

BACKUP YOUR SOFTWARE WITH LOCKSMITH 6.0™.

Locksmith, the controversial copy program that took the Apple world by storm in 1981, has evolved from a powerful bit-copy programmed into a complete disk utility system, allowing the Apple user to recover crashed disks, restore accidentally deleted files, and perform hardware diagnostics on the disk drive and memory boards. The NEW Locksmith version 6.0 is now available and includes an advanced disk recovery utility, a framing-bit analyzer, an automatic boot tracer, a sector editor, many file utilities, and of course, the most powerful bit-copy program available. A fast disk backup utility copies disks in eight seconds flat. Improvements to Locksmith Programming Language have made it more powerful and easier to use for you to write your own backup and repair procedures. Includes a library disk which contains automatic procedures to copy hundreds of Apple programs.

Locksmith requires no additional hardware, but will use any additional RAM memory that it finds, including RAM boards from Applied Engineering and Checkmate Technology.

Don't get caught with your hands tied. Order Locksmith 6.0 today.



NEW LOW PRICE **$79.95**

Registered Locksmith 5.0 owners may upgrade to version 6.0 for **$29.95.**

Available from your computer dealer or directly from:

Alpha Logic Business Systems, Inc.
4119 North Union Road
Woodstock, IL 60098
(815) 568-5166

VISA

©Alpha Logic Business Systems, Inc. 1985
Locksmith and Locksmith/PC are registered trademarks of Alpha Logic Business Systems, Inc.

Circle 199 on Reader Service Card.

RAMWORKS™

ACCEPT NO SUBSTITUTES. BECAUSE THERE AREN'T ANY.

There's only one card like RamWorks. We've got the best hardware design. We supply the best software and we've got the best support from software companies.

If someone tempts you with an imitation, please get both sides of the story. You'll discover why RamWorks offers the best enhancements to AppleWorks and other programs, and at the lowest price.

GUARANTEED!

214-241-6060
9 AM - 11 PM

"We Set the Standard"
APPLIED ENGINEERING

Diversi-DOS™
Still The Best!

The top-rated DOS 3.3 enhancement program. Lots of extras! DOS Mover frees up 10K memory. Includes new insert/delete mode, improved BASIC listings, keyboard MACROS, wildcard filenames, text file printer, keyboard/print buffers, **fast garbage collection**, and MORE! Works on Apple //c, //e, or 64K II+.

RAM Disk Emulator Now Included
Use the extra 64K in the //c or //e extended 80-column card as a high-speed pseudo-disk drive. Also works with most 128K cards in slot 1-7.

Time in Seconds	DOS 3.3 Floppy	Diversi-DOS Floppy	Diversi-DOS RAM-disk
BSAVE*	13.6	4.1	0.6
BLOAD*	9.5	2.6	0.5
WRITE**	44.6	14.9	7.7
READ**	42.2	12.4	5.5

*Hi-res screen **52-sector text file

Back-up Your Floppy with Diversi-Copy™

The FASTEST way to copy (or format) unprotected DOS 3.3, ProDOS, Pascal or CP/M disks.
Great for Apple //c! Saves over 2 minutes per copy, and eliminates those annoying disk re-insertions.
Verifies every byte, so you know your copies are good.
Shows motor speed on each track, eliminating a major source of errors.
Mass produces 1 copy every 18-20 seconds (may require extra 128K).
Works on all Apple II compatibles.

	ProDOS Copy	Diversi-Copy*
1-Drive Copy (50% Full Disk)	172 sec. 18 insertions	36 sec. 2 insertions
1-Drive Copy (100% Full Disk)	172 sec. 18 insertions	44 sec. 4 insertions
2-Drive Copy	80 sec.	33 sec.

*On 128K Apple //e or //c

NEW: Diversi-DIAL™
Start your own CB-stimulator on an Apple with 7-modems. New profit-making local stations starting all the time. 313-553-4466 (300-baud).

24-Hour Toll-Free Ordering
800/835-2246 ext. 127 (orders only).
For information call 313/553-9460.
Disk normally shipped within 24 hours.
Price includes 1st class or foreign airmail. Return in 30 days for full refund if not totally satisfied
FREE: Dogfight II arcade game, by Bill Basham, included with each disk.

☐ **Diversi-DOS - $30**
☐ **Diversi-Copy - $30**

DIVERSIFIED SOFTWARE RESEARCH, INC.
34880 Bunker Hill
Farmington, MI 48018-2728
Visa/Mastercard/C.O.D./Personal Check accepted

Card No. _____ Exp. _____

PASCAL PRIMER

(also in read and write) statements, though. This observation leads to the next program and an important concept: redirection of input and output (I/O).

Redirecting I/O

The simple program MakeText in **Listing 3** serves as a kind of I/O roundhouse. Text comes in through one door—or file—and leaves through another. The program merely switches input and output tracks to make a surprisingly useful utility.

MakeText asks you to supply input and output file names. File names ending in colons, such as CONSOLE: and PRINTER:, refer to devices; others refer to disk files. PRINTER, therefore, is a disk file, but PRINTER: is a device (in this case, the one attached to an interface card in slot 1). **Table 1** lists other predefined device names.

Line 5 of **Listing 3** introduces a new kind of text file, Interactive. An Interactive file has one small, but significant, difference from other text files. When you reset a File of char or text, Pascal reads the first character of the file and sets its internal file pointer to the second character. But, when you reset an Interactive file, Pascal doesn't read the first character. This difference is often important in programs like MakeText that take their input from the keyboard.

Electronic Typewriters and More

Specifying PRINTER: as MakeText's output file turns the program into an electronic typewriter. Just press the return key to use MakeText's default input and output files; MakeText then prints everything you type. Use control-C to end the program.

But that's not all. MakeText also copies files from one disk to another. Enter the name of an existing text file as input, then supply a destination name as output. For example, use MAKETEXT.TEXT as input and MAKETEXT.BACK as output. In this example, MakeText transfers the contents of the input to the output file, creating a backup of the original disk file.

Still another use for MakeText is to print program listings. Type the name of a text file (CREATE.TEXT, for example) as input. Then, press the return key to use the default output file, PRINTER:. MakeText will now print every line of text in the input file.

That one program can have so many uses is fascinating. But there's no magic here—just the simple idea of I/O redirection at work.

Using the Filer

Finally this month, I'll present three more Filer commands, listed in **Table 2**. Remember, to start the Filer, type F when you see the main command line at the top of your display. To quit the Filer, type Q.

Table 1. Use these volume names to transfer text to and from peripheral devices. CONSOLE: echoes its input, SYSTERM: does not. If a serial card is in slot 3, I/O goes through that card, probably attached to a CRT terminal. Otherwise, Apple Pascal uses its own screen and keyboard.

Volume Name	Description	Interface Slot
CONSOLE:	Screen and keyboard	(3)
SYSTERM:	Screen and keyboard	(3)
PRINTER:	Printer output	1
REMIN:	Remote input	2
REMOUT:	Remote output	2

E(xtended-dir

Type E and a volume name such as APPLE1: or number like #4: to see a directory of files on your disk. As **Figure 1** shows, extended directories start with a volume name, followed by six-column directory entries. Columns show the file's name, its size in 512-byte blocks, the date of its cre-

Table 2. The Filer's directory commands.

E(xtended-dir	Lists a full disk directory
L(ist-dir	Lists a partial disk directory
V(olumes	Lists all on-line devices

WHO MAKES THE BEST APPLEWORKS EXPANSIONS? ASK APPLIED ENGINEERING. WE INVENTED THEM.

Long before there was a market for Appleworks expansions, in fact 5 years before, there was Applied Engineering.

And while others have tried to catch up to us they haven't been able to duplicate AE performance or quality.

Only AE enhances nine Appleworks functions, not just 1 or 2 like others. And AE has a 7 year history of superior performance, support and quality.

The result? Everytime you use an AE product you're assured you're using the best Apple enhancements available.

With somebody else, you can only guess.

APPLIED ENGINEERING
"We Set the Standard"
214-241-6060

GOLEM COMPUTERS

★★★★★★★★★★★★★★★★★★★★★★★★

APPLE
SOFTWARE/HARDWARE
AT SUPER SAVINGS

★★★★★★★★★★★★★★★★★★★★★★★★

PLACE ORDERS TOLL FREE
1-800-345-8112
PA 1-800-662-2444

	LIST PRICE	GOLEM PRICE
HARDWARE SPECIALS		
212 APPLE CAT II SYSTEM (NOVATION)		365.00
MICROMODEM IIE/SMARTCOM I (HAYES)		135.00
SMARTMODEM 300/SMARTCOM IIC (HAYES)		155.00
SMARTMODEM 1200 RS-232 (HAYES)		374.00
PROMODEM 1200A W/SOFT (PROMETHEUS)		284.00
PROMODEM 300C IIC (PROMETHEUS)		135.00
MACH III JOYSTICK W/FIRE BUTTON (CH PROD)		32.00
BUFFERED GRAPLER + (ORANGE MICRO)		136.00
PRINTER KX-1091 (PANASONIC)		242.00
PRINTER MSP-10 (CITIZEN)		250.00
DISK DRIVE SLIM IIc (MICROSCI)		165.00
MONITOR VIDEO 300A AMBER (AMDEK)		127.00
BLANK MEDIA SS/DD 10 (GOLEM)		11.00
EDUCATION		
TYPING TUTOR III	49.95	29.70
MATH BLASTER!	49.95	29.70
TURBO TUTOR	34.95	23.10
MASTER TYPE	39.95	23.60
MIND PROBE	49.95	29.70
WORD ATTACK!	49.95	29.70
WHERE IS CARMEN SAN DIEGO	39.95	23.65
HOME		
DOLLARS AND $ENSE II+/IIe 64K	100.00	59.00
DOLLARS AND $ENSE IIe/IIc 128K	119.95	66.00
CROSSWORD MAGIC	49.95	30.10
NEWSROOM	49.95	29.70
CLIP ART VOL. 1 FOR NEWSROOM	29.95	18.20
MICROCOOK BOOK	40.00	23.60
UTILITIES		
THE PRINT SHOP	49.95	29.60
THE PRINT SHOP GRAPHICS I, II	ea. 24.95	14.25
SIDEWAYS	60.00	33.00
TURBO PASCAL	69.95	41.35
TURBO TOOLBOX	54.95	35.20
CROSSTALK	195.00	138.70
WORD PROCESSING		
SENSIBLE SPELLER IV	125.00	66.00
HOMEWORD	125.00	70.00
PFS: WRITE IIe	125.00	70.00
BANK STREET WRITER	69.95	41.30
BANK STREET SPELLER	69.95	41.30
WORDSTAR	350.00	197.90
BUSINESS		
PFS: REPORT, FILE, GRAPH	ea. 125.00	70.00
BACK TO BASICS ACCT. SYS. IIc	195.00	97.90
THINK TANK	150.00	80.00
BPI GA, AP, AR PAYROLL (PRO DOS)	ea. 425.00	250.00
RECREATION		
GATO	39.95	23.35
SARGON III	49.95	29.70
FLIGHT SIMULATOR II	49.95	31.90
WISHBRINGER	39.95	23.35
SPY HUNTER	44.95	26.65
KARATEKA	39.95	21.00
F-15 STRIKE EAGLE	34.95	21.00
ZORK I	39.95	23.35
ZORK II, III	ea. 44.95	26.65
LODE RUNNER	34.95	21.00
ULTIMA II, III	ea. 59.95	35.50
WIZARDRY	44.95	29.70
HITCHHIKERS GUIDE	39.95	23.60
LEGACY OF LLYLGAMYN	39.95	23.60
KNIGHT OF DIAMONDS	34.95	20.90
KING'S QUEST	49.95	29.60
DRAGON WORLD	39.95	23.60

PLACE ORDERS TOLL FREE
1-800-345-8112 • PA 1-800-662-2444

ALL ITEMS SUBJECT TO AVAILABILITY
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

★★★★★★★★★★★★★★★★★★★★★★★★

To order call toll free or send check or money order VISA/MC C.O.D. orders welcome. Personal and company checks allow 10 working days to clear. Specify if to backorder or to send refund. California residents add 6% sales tax. Include phone number with order. Shipping and handling: All shipments U.P.S. if possible. Continental U.S. add $2.50 for 1 to 3 items. 4 to 6 items add $5.00. APO, FPO Alaska, Hawaii and Canada add $3.00 per item. 2nd day air add $3.00. All hardware purchases are prepaid or VISA/MC; shipped U.P.S. - include 5% for shipping & handling. C.O.D. orders all $1.90. Mail orders to:

GOLEM COMPUTERS
P.O. BOX 6698 • WESTLAKE VILLAGE, CA 91359
Apple is a trademark of Apple Computers, Inc.

PASCAL PRIMER

Figure 1. Use the Filer's Extended directory command to list a six-column directory, showing the size of all files plus the remaining space on the disk.

```
APPLE1:
SYSTEM.APPLE          32   25-Dec-83     6   512   Datafile
SYSTEM.PASCAL         43   25-Dec-83    38   512   Codefile
SYSTEM.EDITOR         47   25-Dec-83    81   512   Codefile
SYSTEM.FILER          29   25-Dec-83   128   512   Codefile
SYSTEM.LIBRARY        39   25-Dec-83   157   512   Codefile
SYSTEM.MISCINFO        1   25-Dec-83   196   192   Datafile
SYSTEM.CHARSET         2   14-Jun-79   197   512   Datafile
SYSTEM.SYNTAX         12   25-Dec-83   199   512   Textfile
< UNUSED >            69               211
8/8 files<listed/in-dir>, 211 blocks used, 69 unused, 69 in largest
```

ation or most recent change, its starting block number on the disk, the number of bytes in the last block, and its type.

The file type is not necessarily the same as the one the file's extension indicates. For instance, the file SYSTEM.EDITOR is a Codefile, although it doesn't end in .CODE. File-name extensions are simply indications, not guarantees, of file contents.

Extended directories also show the amount of unused disk space by identifying each available area as <UNUSED>. **Figure 1** shows 69 unused blocks, or 35,328 bytes available to store files.

The last line of a directory displays general information. The 8/8 at the bottom of **Figure 1** tells you this directory shows eight out of eight files. If you use a wild card, though, as in #5:=.TEXT to list a partial directory, you might see a fraction like 5/12 indicating a listing of five out of 12 files. The last line also shows the total number of used and unused 512-byte blocks and the size of the largest unused space.

To print a directory or store it in a text file, enter a comma and file or device name. For example:

```
Dir listing of what vol ? APPLE2:,PRINTER:
```

prints a directory of volume APPLE2:. You could replace PRINTER: with DIR.TEXT, or any other name ending in .TEXT, then edit that file the same way you edit other text files.

L(ist-dir

This command operates similarly to the much-preferred E(xtended-dir command. The only differences are that it lists an abbreviated three-column directory, and it doesn't show unused disk areas.

V(olumes

Type V to list all volume numbers, names, peripherals, and disks in your computer. **Figure 2** shows the volumes in my system; volumes 9–12 reference a hard-disk drive, but in another system, they might refer to additional floppy disks.

A number sign, #, to the left of a volume name indicates a block-structured device, almost always a disk drive. Otherwise, this volume is a character device. You can transfer .TEXT files to character devices, but you can't ask for directories of them.

At the end of the volume listing, the Filer shows the current root and prefix volume names. After you boot a disk, these names are the same. They might be different, though, if you used the P(refix command to change the prefixed volume.

Pascal News

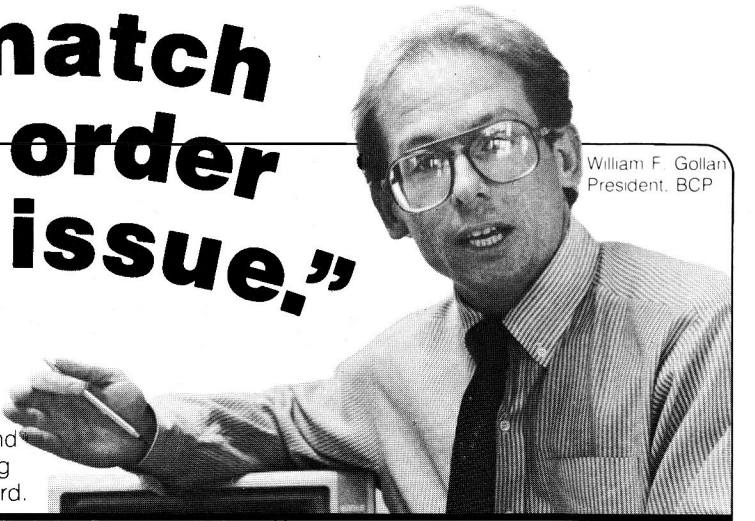
Several people wrote asking about the differences between Apple Pascal 1.1 and 1.2. First, let me reassure everyone that you can use either version to type in and run all programs in this column. The two versions have no differences in syntax.

The main advantage of version 1.2 is its ability to use the additional memory on 128K Apple *//e* computers. This gives you a lot more

Figure 2. The Filer's V(olumes command lists your Apple's peripherals and disk volumes. It also shows the root volume—the one with which you booted—and the current prefix, set with the Filer's P(refix command.

```
Vols on-line:
   1    CONSOLE:
   2    SYSTERM:
   4 #  APPLE1:
   6    PRINTER:
   9 #  H0T000:
  10 #  H1T000:
  11 #  H2T000:
  12 #  H3T000:
Root vol is - APPLED:
Prefix is   - APPLED:
```

"We will match any mail order price in this issue."



We'll support, service and warranty everything we sell and stand behind it 100%. We won't charge you for shipping or handling, nor will we penalize you for using a credit card.

MODEMS

D.C. Hayes		***Prometheus***	
Smart 300 IIc w/sc & cable	179.95	Pro 1200	**309.95**
Micro Modem IIe w/sc	149.95	Pro 1200 A w/sc	**299.95**
Smart 1200	**384.95**	Pro 300C	**CALL**
Smart Modem 2400	**594.95**	***Zoom***	
Transit w/128k	**289.95**	Zoom Micro IIe + w/sc	159.95

PERIPHERALS & ACCESSORIES

Apple		MD 2 DS/DD (10)	**26.95**
II E's & II C's & Macs	**CALL**	***Kensington***	
AST		Dust Image. 10"	**9.95**
Multi I/O	**164.95**	Printer Stand	**19.95**
Checkmate Tech		System Saver	64.95
Multiram II E 64K +80	**129.95**	***Koala Technologies***	
Multiram II E 256K +80	**169.95**	Koala Pad	74.95
Multiram II E 512K +80	**219.95**	***Joysticks***	
Multiram II C w/256K	**239.95**	Kraft	39.95
Multiram II C w/512K	**289.95**	Kraft Quickstick	**54.95**
Curtis		Hayes Mach III's	39.95
Diamond	**34.95**	***Ribbons***	
Emerald	39.95	Black & Multi Colors	**CALL**
Ruby	59.95	***Titan***	
Static Mat	**27.95**	Accellorator	**224.95**
Disks Verbatim		64k Ram	144.95
Bonus SS/DD (10)	12.95	128k Ram	164.95
Bonus DS/DD (10)	16.95	Neptune 192k + 80	239.95
Disks Maxell			
MD 1 SS/DD (10)	**19.95**		

GRAPHIC INTERFACES & BUFFERS

Orange Micro		***Textprint***	
Grappler +	84.95	Print It	**129.95**
Grappler + w/64k	174.95	***Thirdware***	
Grappler + RS-232C	84.95	Fingerprint +	**94.95**
Grappler C	**84.95**	Fingerprint + IIC	**94.95**
Hot Link IIc	**49.95**		

PRINTERS DOT MATRIX

Apple		LQ 1500	**929.95**
Imagewriter II 10"	**474.95**	***Okidata***	
Imagewriter 15"	**509.95**	ML 192	**359.95**
Citizen		ML 192 Image.	**389.95**
MSP 10 160	**274.95**	ML 193	**489.95**
MSP 15 160	**374.95**	ML 84	**654.95**
MSP 20 200	**344.95**	***Star Micronics***	
MSP 25 200	**494.95**	SG 10	239.95
Epson America		SD 10	**359.95**
LX 80	239.95	SR 10	**499.95**
LX 80 F/T	**274.95**	***Toshiba***	
FX 85	**369.95**	P 1340	**529.95**
FX 185	**499.95**		

BUSINESS SOFTWARE

ALS		***Kensington***	
List Handler	**54.95**	Format II	94.95
Word Handler	**54.95**	***Living Videotext***	
Spell Handler	**39.95**	Think Tank	**84.95**
Apple		***Megahaus***	
Appleworks	199.95	MegaWorks	79.95
Arrays		Report Works	**CALL**
Home Accountant	**47.95**	***Microsoft***	
BPI Software		Multiplan	**59.95**
A/R	**229.95**	***Monogram***	
G/L	**229.95**	Dollars & Cents	64.95
P/R	**229.95**	Dollars & Cents IIc	74.95
A/P	**229.95**	Forcast	44.95
I/C	**229.95**	***Penguin***	
Broderbund		Home Data Mng.	**29.95**
Bank Street Writer	44.95	Home Connection	**34.95**
Bank Street Speller	44.95	***Quark***	
Bank Street Filer	**44.95**	Catalyst	**89.95**
CBS		Word Juggler	**119.95**
Stockpac II	**94.95**	***Roger Wagner***	
Compuserve		Mouse Write	**74.95**
Subscription Kit	**27.95**	***Sensible Software***	
Dow Jones		Sensible Speller IV	74.95
Market Analyzer +	209.95	Graphics Dept.	**79.95**
Investors Workshop + IIc	**89.95**	***Sierra On Line***	
Market Microscope	**209.95**	Homeword	44.95
Market Mng.	**149.95**	Homeword Speller	34.95
Human Edge		Home Word Filer	**44.95**
Mind Prober	**344.95**		

BUSINESS SOFTWARE

Software Publishing		***Sorcim/IUS***	
PFS:1st Success	**139.95**	Super IIIA	**119.95**
PFS:Write	74.95	***SSI***	
PFS:File	74.95	Word Perfect	**99.95**
PFS:Graph	74.95	***Stoneware***	
PFS:Report	74.95	D.B. Master V 4.0 +	**179.95**
PFS:Plan	**74.95**	***United Software***	
		ASCii Express	84.95

UTILITIES & LANGUAGES SOFTWARE

Baudville		Turbo Tutorial	25.95
Actors & Actions T1	20.95	***Broderbund***	
Business T1	34.95	Dazzle Draw	37.95
Blazing Saddles	**34.95**	Print Shop	34.95
Heroes & Villans T1	20.95	Print Shop GL 1,2 (ea)	**18.95**
Pixit	34.95	Print Shop Refill	13.95
Shape Lib. 1,2,3 (ea)	**13.95**	***Central Point***	
Take 1	37.95	Copy II +	**24.95**
Beagle Brothers		***Funk***	
Alpha Plot	**27.95**	Sideways	**38.95**
Apple Mechanic	20.95	Sideways Pro DOS	**CALL**
Bag	20.95	***Microsoft***	
Basic	25.95	Basic Compiler	**234.95**
Graphics	37.95	COBOL-80	**399.95**
D-Code	27.95	Fortran-80	**119.95**
Diskquick	20.95	***Mindscape***	
DOS Boss	17.95	Mister Pixel's	
Double-Take	25.95	Cartoon Kit	**20.95**
Fat Cat	25.95	Paint Set	**20.95**
Flex Text	20.95	Color Me (Main)	**20.95**
Frame-Up	20.95	Rainbow Brite	**7.95**
GPLE	32.95	Shirt Tales	**7.95**
I.O. Silver	20.95	Hugga Bunch	**7.95**
Pro-Byter	**25.95**	Tink Tonk	**7.95**
Pronto DOS	20.95	***Penguin Software***	
Silicon Salad	17.95	Cat Graphics	24.95
Tip Disk # 1	**13.95**	Graphics Magician	37.95
Triple Dump	27.95	Magic Paintbrush	24.95
Typefaces	**13.95**	***Pinpoint***	
Utility City	17.95	Pinpoint	**45.95**
Borland International		***Terrapin***	
Turbo Pascal 3.0	**44.95**	LOGO	64.95
Turbo Tool	**37.95**		

EDUCATIONAL & PERSONAL SOFTWARE

Barrons		SAT Verbal	**27.95**
Computer SAT	**54.95**	***Learning Company***	
GMAT	**54.95**	Addition Magician	**24.95**
CBS		Gertrudes Puzzle	**29.95**
Goren's Bridge	49.95	Gertrudes Secrets	**29.95**
Mastering SAT	**64.95**	Juggle's Rainbow	**20.95**
Websters:Word Game	**19.95**	Magic Spells	**24.95**
Success Series	**24.95**	Moptown Hotel	**27.95**
Davidson Associates		Moptown Parade	**27.95**
Classmate	**32.95**	Reader Rabbit	**27.95**
Math Blaster	32.95	Robot Odyssey	34.95
Speed Reader II	44.95	Rocky's Boot	34.95
Data Disks A,B,C,D (ea)	**13.95**	Word Spinner	**24.95**
Spell It	32.95	***Meca***	
Word Attack	32.95	Managing Your $	**109.95**
Data Grade(s) (ea)	**13.95**	***Mindscape***	
Data Roots & Pref.	**13.95**	Perfect Score	**49.95**
Data SAT	**13.95**	Keyboard Cadet	**27.95**
Hayden		Lusher Profile	**27.95**
SAT Math	**27.95**	Bank St. Music	**34.95**

EDUCATIONAL & PERSONAL SOFTWARE

Mindscape		***Softsync***	
Bank St. Story B.	**27.95**	Kid Pro Quo	**27.95**
Quality		Model Diet	**25.95**
Bag of Tricks	28.95	Personal Acct.	**34.95**
Beneath Apple DOS	15.95	***Spinnaker***	
Beneath Apple Pro DOS	15.95	Story Machine	**27.95**
Random House		Alphabet Zoo	**20.95**
Charlie Brown's ABC's	**27.95**	Delta Drawing	**27.95**
Snoopy Rescue	**27.95**	Kids on Keys	**19.95**
Scarborough		Kindercomp	**19.95**
Boston Diet	**49.95**	Snooper Trooper 1,2 (ea)	**24.95**
Build a Book	27.95	In Search of	**24.95**
Build Refills 1,2 (ea)	**13.95**	***Springboard***	
Mastertype		The Newsroom	**34.95**
New Improved	27.95	***Virtual Combinatics***	
Figure's & Formulas	**19.95**	Micro Cookbook	27.95
Filer	**27.95**	Added Menue's (ea)	**9.95**
Writing Wizard	**49.95**	***Xerox/Weekly Reader***	
Run for the $	27.95	Sticky Bear	
Songwriter	27.95	ABC	27.95
Personal Net W.	49.95	Basket Bounce	**27.95**
Screenplay		Math	27.95
Ken Houston Black Jk.	**49.95**	Numbers	**27.95**
Trivia Arcade	27.95	Opposites	**27.95**
Simon & Schuster		Reading	**27.95**
Typing Tutor III	34.95	Shapes	**27.95**

GAME SOFTWARE

Activision		***Mindscape***	
Master Lands	**27.95**	Halley Project	**27.95**
Countdown to Shut.	**27.95**	Stephen King Mist	**27.95**
Road Race	**27.95**	James Bond View K.	**27.95**
Alcazar	**27.95**	Forbidden Castle	**27.95**
Ghostbuster's	**27.95**	Voodoo Island	**27.95**
H.E.R.O.	**27.95**	Racter	**29.95**
Pitfall	**27.95**	Tink's Adventure	**20.95**
Space Shuttle	**27.95**	Tonk in Buddy Bots	**20.95**
Mindshadow	**27.95**	Tuk Goes Town	**20.95**
Rock N Bolt	**27.95**	Tinka's Mazes	**20.95**
Blue Chip		Tinka's Sub. Fair	**20.95**
Barron	**29.95**	***Origin***	
Millionaire	**29.95**	Caverns Callisto	**24.95**
Squire	**34.95**	Ultima III Exodus	**37.95**
Tycoon	**29.95**	Autodvel	**CALL**
Broderbund		Ogre	**CALL**
Championship Lode R.	24.95	***Penguin***	
Choplifter	24.95	Pensate	**19.95**
Captain Goodnight	**24.95**	Quest	24.95
CBS		Swords Kadash	24.95
Murder by Doz.	24.95	Transylvania	24.95
Datasoft		Crimson Crown (New)	**24.95**
Bruce Lee	27.95	***Pryority***	
Conan	27.95	Forbidden Quest	**27.95**
Dig Dug	**20.95**	***Sierra On Line***	
PacMan	**20.95**	Frogger	24.95
Zaxxon IIc	**20.95**	King's Quest	34.95
Epyx		***Sir Tech***	
Rogue	**20.95**	Wizardry 1	34.95
Summer Games	**27.95**	Wizardry 2	24.95
Pitstop	**27.95**	Wizardry 3	27.95
Baseball	**24.95**	Wizardry 4	29.95
Summer Games II	**27.95**	***Spectrum***	
Winter Games	**CALL**	Gato	27.95
Football	**CALL**	***Spinnaker/Telarium***	
Temple Apshair	**20.95**	Amazon	**27.95**
Hayden		Dragon World	**27.95**
Holy Grail	**34.95**	Fahrenheit 451	**27.95**
Sargon III	34.95	Rendezvous w/Rama	**27.95**
Infocom		Shawdow Keep	**27.95**
Cutthroats	**27.95**	Homework Writing	**27.95**
Deadline	34.95	Homework Word	**27.95**
Enchanter	27.95	Homework Math	**21.95**
Hitchhiker's G.	27.95	***Strategic Simulations***	
Sorcerer	**29.95**	Baltic 85	24.95
Suspect	29.95	Battle Normandy	**27.95**
Witness	27.95	Carrier Force	**37.95**
Zork 1	27.95	Computer Ambush	**37.95**
Zork 2,3 (ea)	**29.95**	Computer Quarterback	**27.95**
Micro Lge. Sports		Computer Baseball	**27.95**
Baseball	27.95	Germany 85	**37.95**
Microprose		Kampfgruppe	**37.95**
F-15 Strike	24.95	Objective Kursk	**27.95**
NATO Commander	24.95	Questron	**34.95**
Solo Flight	24.95	Reforger 88	**37.95**
Crusade in Europe	**27.95**	War with Russia	**49.95**
Kennedy Approach	**CALL**	***Sublogic***	
Gunship	**CALL**	Flight Simulator II	34.95
Acro Jet	**CALL**		

MONTHLY SPECIAL

VERBATIM Data Lifes

	Retail	BCP
* Single Sided/Double Density (10)	$39.95	$21.95
* Head Cleaning Kit	19.95	FREE
* Library Case	5.95	FREE

SAVE $43.90

+2.50 Shipping

BUSINESS COMPUTERS OF PETERBOROUGH
Gollan Co., Inc.

766 RT. 101 W. • P.O. Box 389 • Peterborough, NH 03458

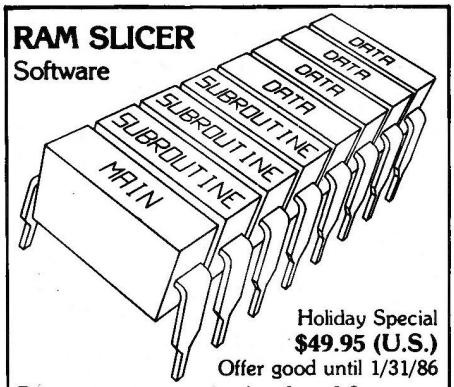
FREE SHIPPING
CONTINENTAL USA/UPS ONLY
APO/FPO WELCOME

MasterCard VISA

ORDERS ONLY 800-845-3003

QUESTIONS 603-924-9406

RAM SLICER
Software



Holiday Special
$49.95 (U.S.)
Offer good until 1/31/86

Do you program in Applesoft?

RAM SLICER is loaded with exciting features activated by commands using the ampersand symbol. RAM SLICER will allow you to improve your programs using features such as: truly independent subroutines, improved input and output capabilities, super fast disk access, and data storage in auxilliary memory. (Using IMEG Applied Engineering RamWorks card you will have an additional 720K of memory for data!)

MAIL COUPON OR CALL TODAY

KWH Technology, Inc. **(313) 474-6864**
PO Box 95 • Farmington, MI 48024

Please send me:

( ) RAM SLICER information (Send information to me immediately. I can't wait for the reader service card!)

( ) RAM SLICER software and documentation for $49.95 (U.S.) (Offer good until 1/31/86) Outside of U.S. and Canada add $5.00. If I'm not satisfied, I may return everything within 14 days for refund of purchase price.

( ) Check enclosed ( ) COD ··· Add $3.00 for COD

Signature _____

Name _____

Address _____

City/ST/Zip _____

Circle 36 on Reader Service Card.

DMP Utilities

Imagewriter™ Owners

- 24 Character sets to Download to your Imagewriter.
- Font Editor to create custom characters.
- Converts hi-res fonts to work with the Imagewriter.
- Simple to use --- menu driven.
- 67 page User's Manual.
- Character sets work with any Apple II application program, including AppleWorks, VisiCalc, and AppleWriter.

"Excellent"
Softalk, Feb 1984
"A necessity"
Creative Computing, June 1984

They cost $50 (+$2 p&h). Versions also available for Epson FX/JX printers. Dealer inquiries invited. Imagewriter, AppleWorks &AppleWriter are Trademarks of Apple Computer. Epson is a Trademark of the Epson Corp.

Circle the reader's service card or phone us to find out more about DMP Utilities.

Vilberg Bros. Computing, Inc.
4201 Hegg Avenue
Madison, WI 53716
(608) 221-0842

PASCAL PRIMER

space for compiling and running programs—more than you'll need for any examples I plan to print here.

Another advantage is an additional 32 program segments. Segments, a subject I'll explore in a future column, offer one way to divide large programs into modules. Apple Pascal stores segments on disk, loading only those it requires at one moment or another.

Finally, Apple fixed several bugs and made other minor enhancements in version 1.2, all of which the *Apple Pascal 1.2 Update Manual* lists.

Sometime around the summer of 1984, Apple announced a $75 upgrade from 1.1 to 1.2. Unfortunately, that offer has now ended; to upgrade and receive the new manual, you have to purchase a brand-new system. That, Apple's new product manager tells me, is official policy.

Next Month

In the next column, I'll continue with more Filer commands, and explain how to use Pascal's file-handling procedures, Get and Put.■

Tom Swan is the author of the Apple Pascal series, Pascal Programs for Business, Pascal Programs for Games and Graphics, *and* Pascal Programs for Data Base Management, *published by Hayden Book Company. Address correspondence to Tom at P.O. Box 206, Lititz, PA 17543.*

Listing 3. MAKETEXT.TEXT.

```
 0: PROGRAM MakeText;
 1: CONST
 2:     DefInName = 'CONSOLE:';
 3:     DefOutName = 'PRINTER:';
 4: VAR
 5:     InFile, OutFile : Interactive;
 6:     InName, OutName, s : string;
 7:
 8: PROCEDURE GetName(      Message : string;
 9:                     VAR Name    : string;
10:                         Default : string );
11: BEGIN
12:     writeln;
13:     write( Message, '? [', Default, '] ' );
14:     readln( Name );
15:     IF length( Name ) = 0
16:         THEN Name := Default
17: END; { GetName }
18:
19: BEGIN
20:     page( output );
21:     writeln;
22:     writeln( 'Make text' );
23:     writeln;
24:     GetName( 'Input file', InName, DefInName );
25:     GetName( 'Output file', OutName, DefOutName );
26:     reset( InFile, InName );
27:     rewrite( OutFile, OutName );
28:     writeln;
29:     WHILE NOT eof( InFile ) DO
30:     BEGIN
31:         readln( InFile, s );
32:         writeln( OutFile, s )
33:     END;
34:     close( OutFile, lock )
35: END.
```

This Publication is available in Microform.

University Microfilms International

Please send additional information
for _____
Name_____
Institution_____
Street_____
City_____
State_____ Zip_____

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

Fly the unfriendly skies.

3D, scrolling flight simulation w. air-air & air-ground combat.

On-board computer, working gauges & 3 weapon systems.

3 skill levels, 15 scenarios, long-playing strategic depth.

You're in the cockpit of a dream machine—a bad dream for the poor sap whose tail you're waxing. You stick a silver bird up his exhaust and wince as he blossoms into fire. And then you rain down like pestilence upon the grunts in the tanks.

Skyfox. It's the fastest-selling EA game in history. It has the most awesome, high-speed animation you've ever seen on your computer. It's played to rave reviews in every magazine. And it's yours—at your retailer—or direct from EA at (800) 227-6703 with a 14-day satisfaction or money-back guarantee.

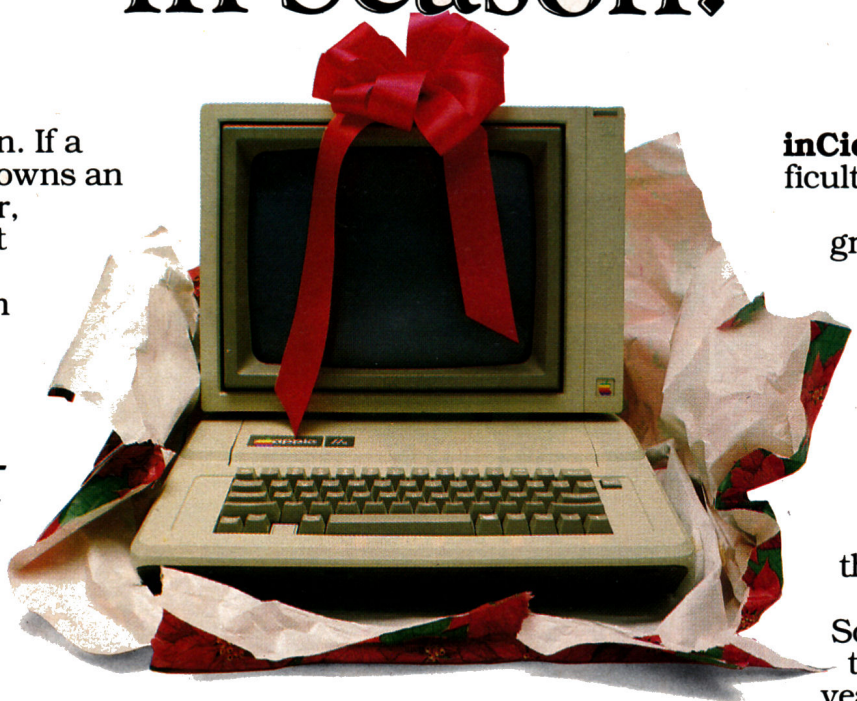
SKYFOX™

from ELECTRONIC ARTS™

ORDERING INFORMATION & MACHINE AVAILABILITY: Visit your retailer or call (800) 227-6703 (in CA call (800) 632-7979) for VISA or MasterCard orders. To purchase by mail, send check or money order to Electronic Arts, P.O. Box 306, Half Moon Bay, CA 94019. Add $3 for insured shipping & handling. Indicate machine verson desired. Allow 1-4 weeks for delivery. Apple II family available now at $39.95. C-64 available now at $34.95. For a copy of our complete catalogue and direct order form, send 50¢ and a stamped, self-addressed envelope to Electronic Arts, 2755 Campus Drive, San Mateo, CA 94403.

Circle 147 on Reader Service Card.

It's Christmas and Apples are in Season.



Christmas again. If a relative or friend owns an Apple II computer, you ought to start thinking about what to give them for Christmas.

Why not give them the most useful gift of all, **user-friendly information**. Information like that found only in **inCider** magazine, the Apple II Journal.

inCider takes the difficulty out of learning about Applesoft, graphics programming, assembly language, games, business and educational applications. **inCider** makes computing easier and more fun. Isn't that what gift giving is all about? So, when it comes to Christmas this year, give **inCider**.

inCider The Apple II Journal

YES!

I want to give the right gift to my Apple II friends. 12 issues for $24.97.

☐ Payment enclosed ☐ Bill me after the holidays
(Please make checks payable to *inCider*)

My Name _____

Address _____

City _____ State _____ Zip _____

Please enter a one year gift subscription for:

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico $27.97, 1 year only. US Funds drawn on US Bank. Foreign Surface $44.97, 1 year only, US Funds drawn on US Bank. Foreign Airmail, please inquire. All gift subscriptions will begin with the first available issue in 1986.

65DB5

CW Communications/Peterborough • inCider • PO Box 911 • Farmingdale, NY 11737

Manufacturing Company, Inc.

CURTIS

The Experts in Accessories

Two FREE Elephants... With Any Curtis Surge Protector

Right now, when you purchase a Curtis surge protector you receive two FREE Elephant Premium 5¼" diskettes. So, if you're hunting for high quality surge protection get it now and bag two FREE diskettes.

Curtis surge protectors, now a better deal than ever, guarantee protection for your computer hardware and data against damaging AC power line interferences such as surges, spikes and other transients. EMI-RFI is also available.

Beat the stampede on this limited supply offer and ask your computer dealer for Curtis surge protection, Plus Two FREE Elephant Premium diskettes. All from Curtis–The Experts in Accessories.

2 FREE
Elephant Premium 5¼" DSDD diskettes with each Curtis surge protector

Ruby Technical Specifications:

• 6 Outlets, 15 Amps Total, 125 Volts, 1875 Watts • Operating Temperature: –40°C to +85°C • Peak Pulse Power Dissipation 25°C, 585,000W for 100 Sec. • Maximum Clamping Voltage @ Test Current 50A (8/20 Microsec.) 340V Clamping Occurs Line to Line (Normal Mode) and Line to Ground (Common Mode). • Clamping Response Time: 1 Nanosecond (1 × 10⁻⁹ Sec.) • Dielectric Test: 3000 VAC 60 Sec. • Forward Surge Rating @ 25°C, 1440 Amps for 1/120 Sec.• Mode Noise Protection: Normal and Common Mode • Noise Rejection Frequency: 150 KHz–30 MHz • Attenuation: 5dB–58dB

Curtis products are available nationally from leading Dealers, Distributors, and Retail Chains. In Canada: Micro-Computer Products, P.O. Box 235, Ajax, ONT, Canada L1S 3C3, (416) 427-6612.

For the Curtis dealer nearest you call (603) 924-3823

Manufacturing Company, Inc.

CURTIS

305 Union Street, Peterborough, NH 03458

FATTER
Than a Fat Mac...

MultiRam™ cards turn your existing Apple //c or //e into powerhouse computers.

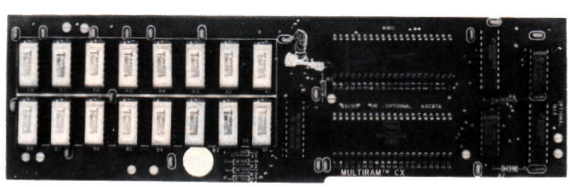
Vast and Fast

The MultiRam™ CX Card adds up to 512K to your Apple //c's own 128K giving it more memory than a Macintosh and as much memory as a 640K IBM. Easy and fast installation requires only a screwdriver.

The MultiRam™ //e Card adds up to 768K on a single card to your //e and can be easily expanded up to 1.5 megabytes. Simply insert it in your auxiliary slot and go.

AppleWorks Punch

Put your expanded Apple to work immediately with an expanded AppleWorks program. Our software gives AppleWorks up to 425K Desktop in the //c and up to a 568K Desktop (1,137K with piggy back card) in the //e. Create databases with up to 5,350 records, 4,000 more records than normal. See the date and time on screen and automatically insert it into a database date field using any ProDOS compatible clock card. Speed up AppleWorks by loading all of the program into memory and never access the program disk again — not even for printing!



MultiRam™ CX

You can put a RAM disk into memory to use along with an expanded AppleWorks Desktop and switch between AppleWorks and programs on the RAM disk at lightning fast speed.

Our AppleWorks software is designed to work with other AppleWorks utility software like Jeeves™ and Pinpoint™ to give you the most powerful AppleWorks combinations possible.

Ram Disks, Compatibility (and more)

Each MultiRam™ Card comes with ProDOS and DOS 3.3 RAM disk software to turn MultiRam™ memory into huge RAM drives

Apple, AppleWorks, DOS 3.3, MacIntosh, ProDOS, UniDisk are registered trademarks of Apple Computer, Inc.
FlashCalc is the trademark of Paladin Software Corporation / IBM is the trademark of International Business Machines, Inc. / Jeeves is the trademark of PBI Software, Inc.
Locksmith is the trademark of Alpha Logic Business Systems / Magic Office is the trademark of Artsci, Inc. / MultiRam is the trademark of Checkmate Technology, Inc.
Pinpoint is the trademark of Pinpoint Publishing, Inc. / SuperCalc3a is the trademark of Sorcim/IUS, Inc.

...More POWERFUL Than an IBM

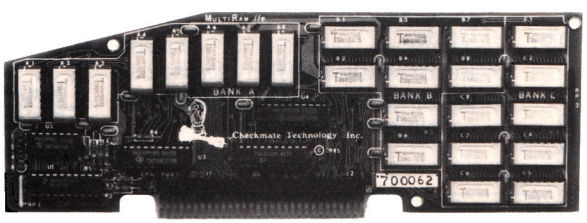
with speeds over 20 times faster than floppy drives. For those who want to add their own RAM, each card comes with a hi-res RAM test utility for easy RAM troubleshooting.

Programs like FlashCalc™, Magic Office™, SuperCalc3a™, Locksmith™ and other current programs will recognize MultiRam™ memory and others are being written or modified to do so.

MultiRam™ cards are designed to work with all hard disk drives, accelerator cards, the new Apple 800K UniDisk 3.5 drive, and other complementary hardware.

16-Bit Power

Shift your Apple into high gear with the optional 65C816 CX™ Kit for the //c or the MultiRam™ //EX Card for the //e. These MultiRam™ options bridge the gap between today's Apple and tomorrows promised Apple.



MultiRam™ //e

The 65C816 "X" options bring three unique benefits to your //c or //e: **(1)** Software for the 65C816 runs 4 or more times faster than existing Apple software, **(2)** 65C816 software is more powerful and easy to use as the 65C816 can directly address 16 megabytes of memory (both "X" options can use all added MultiRam™ memory), and **(3)** because the 65C816 works like a 65C02 until shifted into 16-bit mode, "X" options are 100% compatible with today's software.

Look for announcements of powerful new, 16 bit integrated software for the MultiRam™ family in Jan/Feb 1986 — software to rival or surpass the Mac and IBM!

Great Prices

MultiRam™ cards are designed to be affordable because they're modular. Buy what you need now, and add on more memory or a 65C816 kit or card when you're ready. ■

MultiRam™ prices start at $159.95

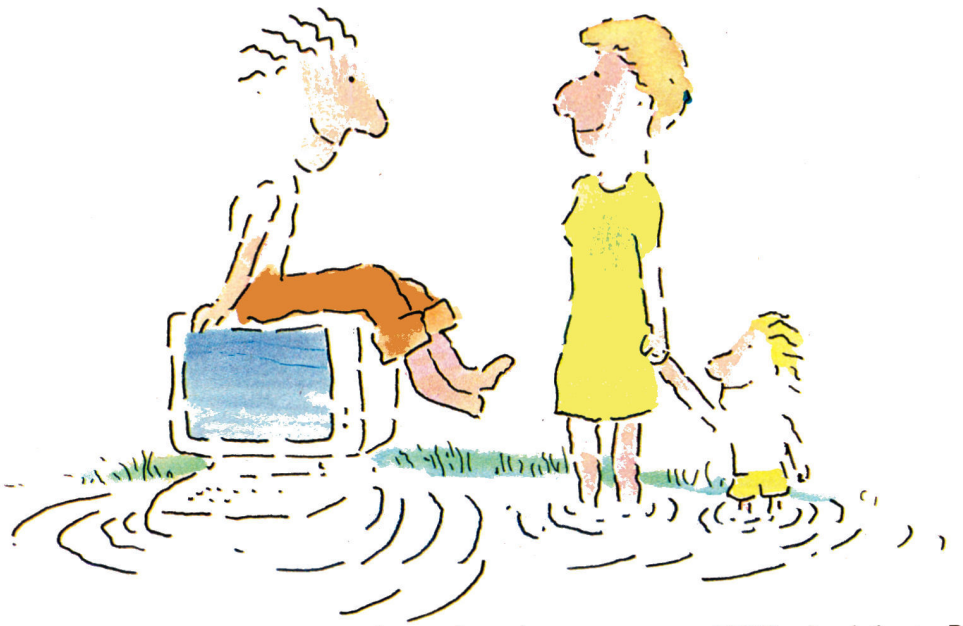
Made in U.S.A. with a full 5 year warranty

Ask your dealer for MultiRam™ today.

Checkmate Technology, Inc.

509 South Rockford Drive • Tempe, Arizona 85281-3021
™ (602) 966-5802 U.S.A. Telex: 165-025 CEC PHX
Circle 227 on Reader Service Card. (800) 325-7347

GET YOUR FEET WET...



. . . IN THE INFORMATION AGE WITH THE DOW JONES NEWS/RETRIEVAL® MEMBERSHIP KIT. SAMPLE A CONTINUOUS STREAM OF KNOWLEDGE AT A PRICE YOU CAN AFFORD.

Now you and your whole family can experience the information age without getting in over your head.

For just $29.95, the new Dow Jones News/Retrieval Membership Kit leads you step-by-step into entertaining and informative data bases. With **five free hours** to sample and explore, you can find a fact, shop at home, get the scores, plan a trip, review a movie, choose a stock, or check world and business news. There's a lot more, too. All you need to get started is a computer and modem:

The Membership Kit is a big value that entitles you to:

- FREE password ($75 value)
- Easy, step-by-step User's Guide
- FIVE FREE HOURS of usage to explore the magic of this comprehensive service
- FREE subscription to *Dowline*™, the magazine of Dow Jones Information Services

Get your feet wet in the information age with the Dow Jones News/Retrieval Membership Kit. At $29.95, you'll enjoy the dip without getting soaked. Available at computer retailers and selected bookstores. For the location nearest you, call:

1-800-257-5114

In New Jersey, Canada and Alaska 1-609-452-1511

"Free time" offer limited to five(5) hours per household. Must be used within 30 days of receipt of password. Nominal service fee still applies.

"Toss away any preconception that Dow Jones News/Retrieval is a stuffy, one dimensional data base service designed only for an elite corps of stock analysts and Wall Street wizards. Far from it—Dow Jones News/Retrieval also provides entertaining movie reviews, current weather and sports reports, convenient electronic shopping and inexpensive electronic mail. . .Dow Jones News/Retrieval is informative, entertaining and well worth the money."
-Brad Baldwin, *InfoWorld* **Magazine**

DOW JONES NEWS/RETRIEVAL®

© 1985 Dow Jones and Company, Inc.
All Rights Reserved. Dow Jones News/Retrieval® is a registered service mark of Dow Jones and Company, Inc.

Circle 30 on Reader Service Card.

APPLE CLINIC

by Jim Sather

The Apple Clinic is a forum for discussing Apple II hardware and related subjects. If you have questions or answers, or want to make a statement, write to Jim Sather, Apple Clinic, inCider, *80 Pine Street, Peterborough, NH 03458.*

More Trains

I'm an *inCider* subscriber and a regular reader of your column, and saw C. de Gier's letter in your August issue. Our magazine, *Model Railroader* (Kalmbach Publishing, 1027 North Seventh Street, Milwaukee, WI 53233) has been running a series on building a C/MRI (computer/model-railroad interface). It began in our February 1985 issue and is scheduled to conclude in February 1986.

Installments already published provide detailed instructions on interfacing with a number of home computers, including the Apple II, II Plus, and //e. The series will conclude with articles on two major model-railroad-software applications: computerized cab control and computer-driven trackside signals.

Dr. Bruce Chubb, vice president of engineering design at Lear-Siegler's Instrument Division in Grand Rapids, Michigan, is the author of this series. Chubb is a model-railroad hobbyist of long standing, and has written many articles for *Model Railroader,* as well as a book on model-railroad operation that our company publishes. His own model railroad is interfaced with a Heathkit H8 computer, using more than 200 discrete input and output lines.

Andy Sperandeo
Associate Editor
Model Railroader

Several other readers wrote to recommend the Model Railroader *series. The introductory article in the February 1983 issue gives an overview of the C/MRI task and a general description of Dr. Chubb's C/MRI. I think this series will greatly interest anyone desiring to interface a computer to several devices, whether these devices are part of a model railroad or not. Incidentally, an April 1983 article in this series mentions an overview of a computer-controlled power-routing and signaling system.*

Dr. Chubb presents a system based on a multiple-connector I/O motherboard and a universal bus adapter that provides signal buffering and power isolation between the I/O motherboard and the controlling computer. The motherboard hosts a number of 24-channel I/O cards, each of which can access the buffered address bus and data bus of the controlling computer. A specially designed adapter connects the controlling computer to the bus extender. Chubb promises adapter designs for slotted Apple (not //c), Commodore, IBM PC, and Radio Shack computers. The Apple adapter simply plugs into one of the peripheral slots.

I had never seen Model Railroader *before, but it's a fascinating magazine, cover to cover. Some of these people are building their trains from scratch—home-brewed micro choo-choos. An Apple owner with time on his or her hands could really have some fun with that.*

Return to Revision-A?

I bought my Apple //e in December 1983. Now I want to upgrade to 128K so I can use double-hi-res graphics. I've read that I must have a Revision B motherboard in my computer to use double hi-res. How can I tell if my computer has this board?

Chris Hixson
Port Charlotte, FL

Comparatively few Rev-A motherboards have been sold, so it's unlikely that one purchased in December 1983 was a Rev-A. I bought my Rev-B Apple //e in April 1983. Remove the cover from your Apple and look at the numbers printed near the back. If your numbers are 607-0164-A and 820-0064-A, you have a Rev-A motherboard. If they're 607-0164-B and 820-0064-B, you have a Rev-B motherboard. The 820 number is the part number of an unpopulated motherboard, and the 607 number is the part number of a populated motherboard.

At some point in 1985, Apple changed the part numbers to 607-0187-A and 820-0087-A without making any major operational change. Everybody still refers to the current motherboard as the Rev-B motherboard, even though it has an A part number.

Franklin 80-Column Card

I recently upgraded my Apple //e to an extended 80-column card from the standard 80-column card (both from Apple). Can I use this card in a Franklin ACE 1000? I was told I couldn't, but the Apple dealer's explanation wasn't too clear or convincing. If I can't, why not?

Rob Klingsten
Howell, MI

You can't. The Apple //e 80-column card resides in the Apple //e auxiliary slot, which is different electrically and mechanically from the peripheral slots. These cards have 60 pins instead of the 50 pins found in the peripheral slots of Apples and Franklins. No slot in an ACE 1000 will accept a card designed for the Apple //e auxiliary slot. To my knowledge, no computer in production except the Apple //e will accept such cards.

Converting to Extended 80-Column

I have an Apple //e and a regular 80-column card (not extended). Can I inexpensively convert it to an extended 80-column card to get 128K and double-hi-res graphics?

Erik Moon
Bloom, MN

Converting the 1K Apple //e RAM card to a 64K card is both inexpensive and simple. Fortunately, it's even cheaper and simpler just to buy a new 64K card. Current Apple magazines advertise a variety of 64K cards (extended 80-column cards) priced at less than $100. The cheapest one I find this month is a no-namer available from Memory Plus Distributors for $65 plus $3 shipping. If you want to convert instead of buying a new card, a conversion kit is available from Caribbean Computer Sales for $99.95 plus $3 shipping.

The conversion kit is an eight-chip PC board that plugs into IC sockets on Apple's 1K card. The 64K card is a ten-chip PC board that plugs into the auxiliary slot. The products, therefore, cost about the same to manufacture and should be priced about the same. The reason the 64K RAM cards are priced so competitively is that the market for auxiliary-slot RAM cards is huge, with numerous manufacturers from which to choose.

Product Information

Extend 80
Caribbean Computer Sales
221 East Osceola, Suite 210
Stuart, FL 33494
(305) 287-3336
$99.95 **Reader Service Number 300**

64K card
Memory Plus Distributors
2632 West Baseline Road
Mesa, AZ 85202
(602) 820-8819
$65 **Reader Service Number 301**

Foreign Computer Stores/Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that CW/Peterborough provides.

Provide your audience with the magazine they need and make money at the same time. For details on selling **80 MICRO**, **inCider**, **RUN** and **AmigaWorld** contact:

Sandra Joseph
World Wide Media
386 Park Ave., South
New York, NY 10016
Phone (212) 686-1520
Telex-620430

TermExec

"TermExec does a lot for the money." InCider

A total communications resource, TermExec lets you talk with any other phone-accessible computer...mainframes, information services, or micro-based Bulletin Board systems.

A lot for $95.00 with our money-back guarantee. American Express, Visa & Mastercard accepted. Write or call today for more information and our free brochure.

Quinsept, Inc.
P. O. Box 216, Dept. IC
Lexington, MA 02173 / (617) 641-2930
Bulletin Board (617) 863-0282

Configuring Apple //c Ports

I recently had trouble sending instructions from my Apple //c to my Imagewriter. I tried to create page breaks when listing BASIC programs. I had to send 134 control characters to my Imagewriter by first booting the System Utilities disk and then changing the configuration of port 1 to "do not insert CR."

Is there any way to reconfigure port 1 without booting the System Utilities disk? It would certainly be easier if you could combine a simple program with other programs instead of swapping disks. Thanks for your help in this matter.

Gordon Cumming
St. Catharines, Ontario

To reconfigure port 1, first type PRINT CHR$(4);"PR#1". Then type PRINT CHR$(9);"K" to disable automatic line feed after carriage return, and, finally, type PRINT CHR$(9);"L" to enable automatic line feed after carriage return. You can find these and other control-I port-1 configuration commands on page 131, volume 1 of the Apple //c Reference Manual. *No Apple //c owner should be without one. You can purchase the two-volume reference manual for $50 at any Apple dealership worth its salt.*

Imagewriter and Grappler Plus

I'm a novice Apple //e user having trouble with my Imagewriter printer and Grappler Plus printer interface. I can't get commands like IGR (rotated graphics dump) to operate. I don't know if it's the way I'm entering these commands (control IGR, control-IGR) or if the trouble is my printer. How should I set my DIP switches for my system?

David A. Swain
Cottage Grove, MN

According to an addendum to the Grappler Plus manual, set Grappler DIP switches 1, 2, and 4 off and switch 3 on. Set printer switches SW1-6, SW1-7, SW2-6, and SW2-7 closed and SW1-8, SW2-2, and SW2-5 open. To get the Grappler to generate a rotated dump, the computer must send the code for control-I followed by the code for the letters GR. PRINT CHR$(9);"GR" should do the trick. If not, your printer/Grappler combination has a problem. ■

SCRG SOUTHERN CALIFORNIA RESEARCH GROUP

INSTANT
APPLEWORKS™

Now, you can have **APPLEWORKS**™ *built-in* your APPLE //e™. With our programming service, your copy of **APPLEWORKS,** and the **quikLoader**™, your computer can be ready within 2 seconds after applying power.

After receiving your order, we will immediately send you a kit containing everything you'll need. (Units purchased through dealers will contain the kit). Copy your original **APPLEWORKS** program onto the disks included in the kit. Configure the program the way you want it used, and return it to us in the envelope provided. We will program the necessary "chips", install them in the **quikLoader**, verify proper operation, and rush it to you. When you receive it, just plug it into *any* peripheral slot. No more searching for your disks, waiting for the startup disk to load, swapping to the program disk, and waiting even longer. The quikLoader is faster and more reliable than even a hard disk drive. Updates should be no problem, as the "chips" are re-programmable.

quikLoader– $179.50
programming service– 89.50
Total– $269.00

APPLEWORKS and APPLE //e are trademarks of APPLE COMPUTER INC.
quikLoader (designed by Jim Sather) is a trademark of S.C.R.G.

SWITCH-A-SLOT

$179.50

Designed by Joy George
The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards in one slot. One of these cards is selected for use, and *only* that card draws power.

This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

SWITCH-A-SLOT and **EXTEND-A-SLOT** work well with most slow to medium speed cards, such as modems, printers, clock, music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards.
Due to the nature of these products, and unit-to-unit variations of computers and peripherals, we are unable to guarantee that these products will work with any particular system. However, as with all our products, we offer a ten-day trial period. If our product does not operate to your satisfaction, return it for a prompt refund.

EXTEND-A-SLOT

The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" (45cm) cable is long enough to allow placement of the card in a convenient location. the high quality connectors are gold plated for reliability. **$34.95**

SLOT 3 CLOCK™

Designed by Chuck Shaffer

The **SLOT 3 CLOCK** will plug into any slot of the APPLE][,][+, or //e. The main feature is that, unlike most cards, it can plug into slot 3 of the //e *without interfering* with the operation of the Extended 80-column card. **PRODOS**™ is fully supported, and the card is APPLESOFT™ compatible. Installation software and a long-life DURACELL™ lithium battery are included.

$79.50

PROmGRAMER™

Hardware design by Bob Brice — Software by Bob Sander-Cederlof

The PROmGRAMER is an inexpensive **EPROM** (**E**rasable **P**rogrammable **R**ead **O**nly **M**emory) programmer for the **APPLE**][,][+, and //e computers. The unit plugs into any slot of the computer, and allows the user to program any standard 5 volt, 27 series **EPROM.** Although not intended as a production tool, the ease of use allows rapid programming, copying, duplication, or modification of **EPROM**s.

$179.50

Paddle-Adapple

The **PADDLE-ADAPPLE** is a game plug expansion adapter that plugs into the interior game I/O socket, and is designed to operate in one of two modes. In the first, it allows you select between one of two devices, such as Koala Pad™ and joystick. The device is selected by the flip of a switch. In the second mode, the **PADDLE-ADAPPLE**, with appropriate software, allows the use of two joysticks simultaneously to allow use with games such as **ONE-ON-ONE**™ and **ARCHON**™.

There are three versions to adapt to any combination of the newer type APPLE connector (the 9-pin 'D' sub-miniature), or the older 16-pin plug.

- The **PADDLE-ADAPPLE** has two 16-pin sockets.
- The **PADDLE-ADAPPLE COMBO** has one 'D' subminiature and one 16-pin connector.
- The **PADDLE-ADAPPLE 'D'** has two subminiature 'D' (9-pin) connectors.

$29.95

9-16 Adapter
for APPLE //e & //c

The 9-16 adapter permits the use of most 16-pin I/O devices with the APPLE //e or //c. Plugging this adapter into the subminiature 'D' connector allows the use of 16-pin device, such as the **PADDLE-ADAPPLE**, paddles, joystick, 16 pin Koala Pad™, etc. The only limitations are those devices that use the annunciators or the $CØ4Ø strobe. **NOTE**–the //c does not support two joysticks. **$14.95**

16-9 Adapter
for APPLE][and][+

With this adapter, owners of early APPLEs can take advantage of the newer 9-pin game products, such as paddles, joysticks, **MUPPET LEARNING KEYS**™, etc. **NOTE** – If you have more than one game I/O device, consider purchasing our **PADDLE-ADAPPLE COMBO** or **PADDLE-ADAPPLE 'D'** instead. **$14.95**

at your local dealer or direct from:
SOUTHERN CALIFORNIA RESEARCH GROUP
Post Office Box 593-R
Moorpark, CA 93020
Telephone (805) 529-2082
Telex: 658340 - SCRG (Intertel SNC)

SIX MONTH WARRANTY
TEN DAY RETURN PRIVILEGE
TOLL-FREE ORDER LINES
NAT'L (800) 635-8310
CALIF. (800) 821-0774
Information (805) 529-2082
VISA & MASTERCARD ACCEPTED

Shipping charges: **U.S. & Canada** $2.50
Other: Switch-A-Slot; $10.00 surface; $25.00 air. Other products $5.00 surface; $10.00 air.

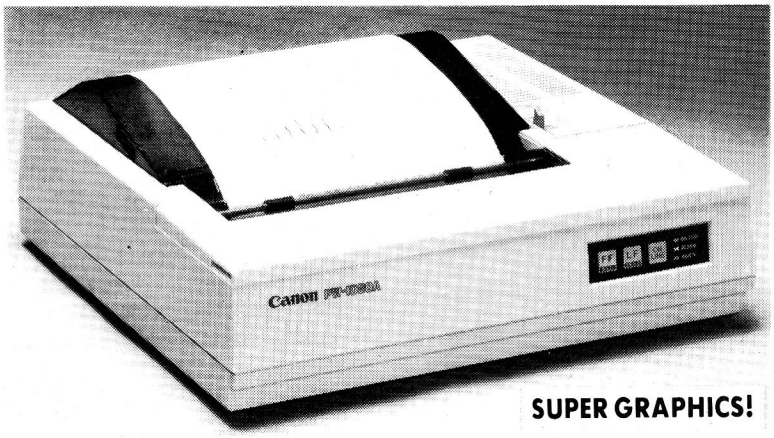
Famous Canon National Brand

10" Carriage **HI-SPEED** **15" Carriage**

PRINTER SALE

Below Wholesale Cost Prices!!!

• 160-180 CPS • High Speed Dot Matrix • Letter Quality Modes
• Tractor/Friction • 4 Character Styles • Business or Personal
• Programmable Characters • 2K Buffer • 15 Day Free Trial
• ONE YEAR IMMEDIATE REPLACEMENT WARRANTY



Print Sample

```
*** NLQ PICA PRINTING ***

CANON IMPACT MATRIX PRINTER   CANC
CANON  IMPACT  MATR
```

Check these features & prices

10" Printer

List $499.00

$199.00

Call for Volume Discounts

15" Printer

List $699.00

$279.00

Call for Volume Discounts

SPECIFICATIONS

(IBM — Commodore)

Printing Method
Impact dot matrix

Printing Speed
160 CPS at standard character printing
27 CPS at NLQ character printing

Printing Direction
Text Mode — Bi-directional
Graphic Mode — Unidirectional

Print Head Life
100 million characters

Printing Characters
Standard 11 x 9 dot matrix
NLQ 23 x 18 dot matrix
Character size: 2 x 2.42 mm (standard)
Character set: Full ASCII character set (96), 32 special European characters

Down Loading
11 x 9 dot matrix; NLQ 23 x 18 dot matrix optional

Print Buffer
2K-byte utility buffer

Image Printing
Image Data: Vertical 8, 9 and/or 16 dot
Resolution: Horizontal 60 dots/inch
Horizontal 120 dots/inch (double density)
Horizontal 240 dots/inch (quadruple density)

Interface
8-bit parallel interface (Centronics type)

Paper
Plain paper, Roll paper, Single sheet, Fanfold, Multipart paper: max. 3 sheets (original plus 2)

(Apple — Atari — Etc.)

Ink Ribbon Cartridge
Ribbon Life: 3 million characters/cartridge

Maximum Number of Characters

Standard:	10 cpi	80 cpl
Enlarged:	5 cpi	40 cpl
Condensed:	17.1 cpi	136 cpl
Condensed enlarged:	8.5 cpi	68 cpl
Elite:	12 cpi	96 cpl
Elite enlarged:	6 cpi	48 cpl
NLQ pica:	10 cpi	80 cpl
NLQ pica enlarged:	5 cpi	40 cpl

Physical Dimensions
Size: 15¾" x 12 5/8" x 4 3/8" (10")
Weight: 17.6 lbs. (10")

Cartridge Ribbon.
List $29.95. **Sale $19.95.**

Interfaces

IBM $89.00 **Apple $59.00** **Atari $59.00** **Commodore $39.00**

Add $13.50 ($15.00 for 15" Printers) for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D. No C.O.D. to Canada, APO-FPO.

COMPUTER DIRECT

We Love Our Customers

22292 N. Pepper Rd., Barrington, Ill. 60010

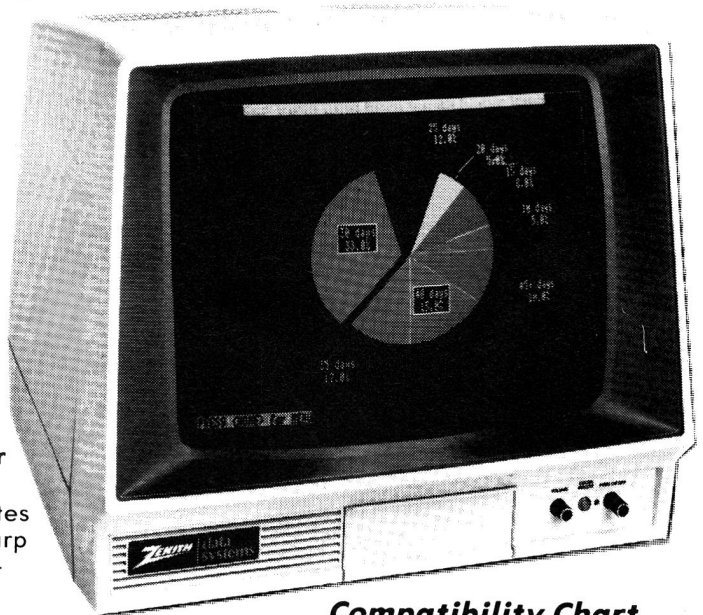
312/382-5050 to order

13" Zenith Complete Color Monitor Sale

• Composite • RGB • Sound

Home Computers VCRs Modular TV Tuners Video Games

Sale $139.95 *LIMITED QUANTITIES*



Excellent Color Reproduction & Special "Green Screen Only" Option

True color reproduction is achieved by a Zenith designed state-of-the-art integrated circuit chip that processes the composite video signal. A custom Zenith analog RGB direct drive gain control integrated circuit allows user-preference for the adjustment of picture drive and black level. Zenith's unique "Green Screen Only" feature eliminates all other colors so that monochromatic text material may be easily displayed in green on the black face screen.

Constant Intensity Character Definition Quality

Quality circuitry design generates crisp lines, pure colors, and sharp character definition for easy-to-read displays. DC-coupling permits the video display to retain its color balance from a single dot to a full screen of data. Even when room lighting changes, a "special light sensor" automatically adjusts the display brightness.

List $499.00

Sale $139.95

ZVM 131-Accessible by Many Popular Systems

The ZVM 131 is designed to interface with most personal computers, VCRs, video discs, video games and modular TV tuners that have either composite video or RGB direct drive outputs.

Compatibility Chart

Computer	Interfaces Via
Apple II	Composite
Aplus 3000	RGB
Apple III	RGB
IBM PC	RGB
Commodore 128	RGB/Composite
Commodore 64	Composite
Commodore Vic-20	Composite
TI 99/4	Composite
Atari 800	Composite
Atari 1200	Composite
Atari 1400	Composite

The ZVM 131 Sound Of Quality

The output sound level is externally regulated by a user-adjustment volume control. Use the Zenith quality sound system to monitor the modern audio capabilities of the computer generation.

Easy-To-Reach Front Access Controls

ZVM 131's 13" diagonal display screen can exhibit impressive graphics and intensely clear copy. Easy-to-reach front access user controls (picture, black level, color level, tint, sharpness, audio volume, background noise control) make display adjustment simple and fast. An LED power on indicator notifies the user when the monitor is operable.

Multiple Monitors On A Single Computer

The composite video "loop-thru" feature permits a single composite video source to drive several monitors at the same time. This allows easy display possibilities for multiple viewers in business and educational applications. No more crowding around a single terminal. Everyone enjoys a clear, unobstructed view of important data.

Connection Cables

RGB Cable — $19.95
C128, Aplus 3000 (Specify)

Composite — $9.95
Commodore, Aplus 3000, Atari (Specify)

This Is The Best Value Of The Century

Add $14.50 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $29.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars.
WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.
Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days delivery. 2 to 7 days for phone orders. 1 day express mail!
VISA — MASTERCARD — C.O.D. No C.O.D. to Canada or APO-FPO

COMPUTER DIRECT
We Love Our Customers
22292 N. Pepper Rd., Barrington, Ill. 60010
312/382-5050 to order

RIGHT OF ASSEMBLY

An Assemblage of Assemblers

by Roger Wagner

Discover how assemblers work and how to use subroutines in your assembly-language programs.

Last month, I presented a simple machine-language program (see **Listing 1**) that put the letter A on the text screen. I'll quickly review the program to summarize some of the important points presented so far.

In **Listing 1**, created using the Monitor LIST command, the numbers at the far left are the memory addresses at which you find the various bytes of the machine-language program. The bytes themselves, indicated by the hexadecimal numbers in column 2, are the actual machine-language program, and are referred to as the *object code* of the program. The last column of information is referred to as the *source code* for the program, and is usually created using an *assembler*.

The individual commands that make up each line of the source code are called *mnemonics*. An *assembly-language* program is created by entering lines of these mnemonics, along with other information, into an assembler. The assembler then translates the mnemonics into the appropriate bytes to create the object code, and stores this in memory. You usually save both the source and object code as disk files for later use. Use the object code (reload it from disk) when you desire the actual program, and the source code when you want to make a change in the program.

Using an Assembler

A number of assemblers are commercially available for the Apple and virtually every other computer in the world. For the Apple, popular assemblers include Apple Computer's own ED/ASM (also called the DOS Toolkit Assembler), the S.C. Macro Assembler, and the Merlin and MerlinPro assemblers. The public domain also supplies a number of assemblers. You can best find these by checking with the librarian of your local user group.

An assembler's main purpose is to take the mnemonics you enter and translate them into the proper hex bytes (called opcodes) that make up the machine-language program. All assemblers easily and correctly handle this task. What really makes a "good" assembler, though, is a combination of its ability to edit the source listing as you enter it and the extra commands built into the assembler for the convenience of the programmer. These extra commands let you load and save source and object code, link multiple source files together, assemble object code for computers other than the Apple, and do many other things.

A major group of these extra functions are often called *pseudo-ops*, or *directives*. "Directive" is probably the more descriptive term; it tells the assembler itself to do something special during the assembly process. Unlike a mnemonic, which actually represents an instruction the 6502 microprocessor understands, you can use a directive to create a wide variety of functions within the assembly-language source listing.

For example, in **Listing 1**, the command LDA #$C1 creates bytes $A9 and $C1 to tell the 6502 to load the accumulator with the value $C1. Suppose, though, you simply wanted to create a space for some data in your program, data the program itself may use later. In this case, you can use a statement like DS 5 in the source listing to set aside 5 bytes of memory (usually filled with zeros to start) within the object code the assembler creates. The letters DS stand for Defined Storage, and are a directive for the assembler. You'll be learning about a lot of directives as this column progresses.

The Mini-Assembler

To get your first taste of using an assembler, you don't have to go out and buy one: You probably already have the "mini-assembler," so called because it provides only the bare essentials of an assembler's functions—translating mnemonics into object-code bytes. This mini-assembler is present on all DOS 3.3 System Master disks (within Integer BASIC), any II or II Plus with Integer BASIC available, and on //c's and enhanced //e's.

How to Install and "RUN" the Mini-Assembler

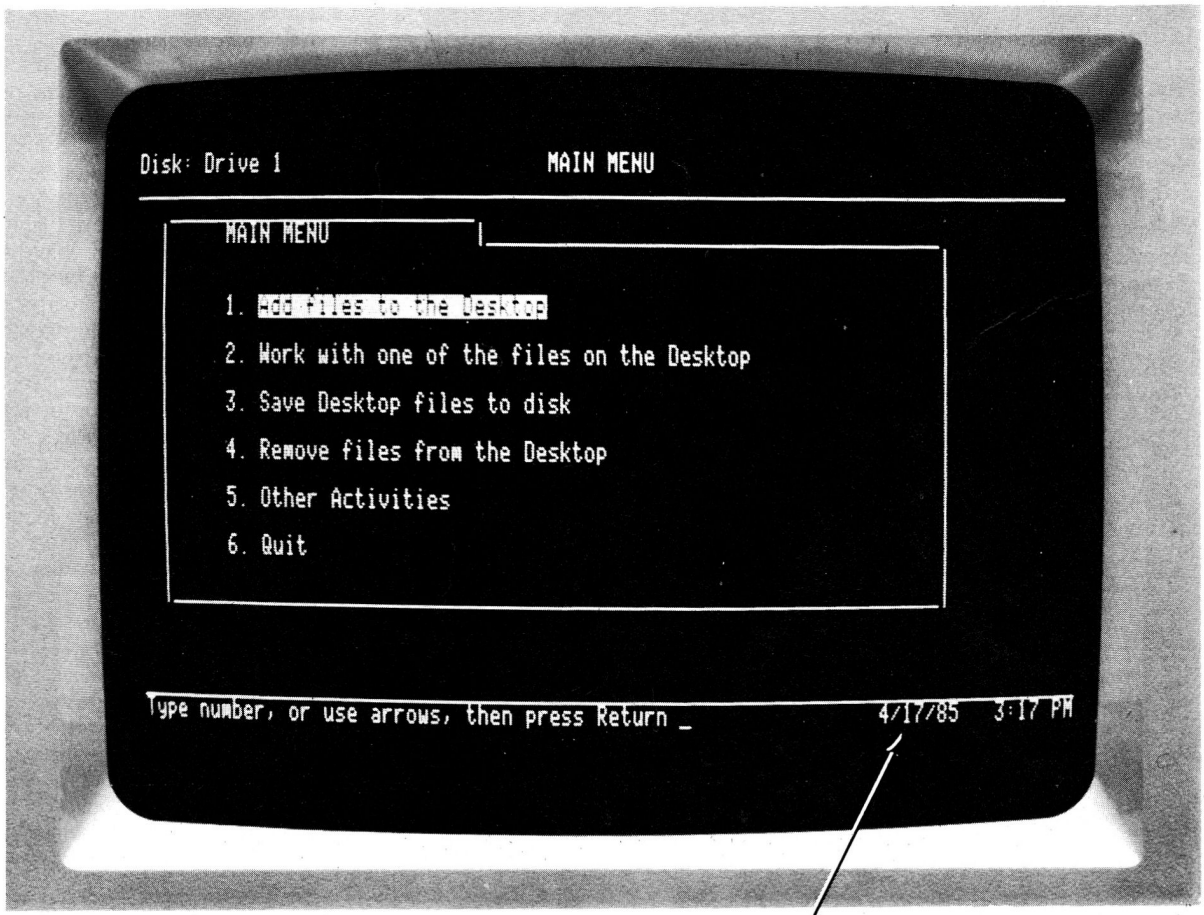
For //c and enhanced //e's only: If you have a //c or enhanced //e (65C02 microprocessor and mousetext character set installed), you can enter the mini-assembler by first making sure you're in Applesoft's immediate mode (the] prompt will be on screen). Then type in CALL -151 to enter the Monitor. Finally, type an exclamation mark (!) and press the return key. The prompt should change to an exclamation, indicating that the mini-assembler is now active.

For all other Apple systems: You will first have to install Integer BASIC. If you don't have one of the original Apple II systems on which Integer is

Listing 1. Assembly-language program. The first column shows memory addresses; the second, object code; the third, source code.

```
0300- A9 C1      LDA #$C1
0302- 8D BC 05   STA $05BC
0305- 60         RTS
0306- ??
0307- ??
0308- ??
```

If You Have
APPLEWORKS™
It's Easy To Tell If You Have A Timemaster H.O. Clock In Your Apple



Just Look Right Here

Only the Timemaster H.O. displays the date and time on the Appleworks screen.* If you don't have a Timemaster H.O., you'll just get the help key reminder. The Timemaster H.O. will also automatically time and date stamp your files on disk. And don't forget, the Timemaster H.O. has all the features of all the competition combined, including year, leap year (not just in PRO-DOS), month, date, day, hours, minutes, seconds and milliseconds. The Timemaster H.O. is compatible with PRO-DOS, DOS 3.3, PASCAL and CP/M. And the Timemaster H.O. automatically emulates all other clock cards so you won't have any compatibility problems because the Timemaster H.O. works with ANY program that reads ANY clock.

In fact, you could put ALL the competitive cards in every slot in your Apple and you still wouldn't have all the features of the Timemaster H.O.

The Timemaster H.O. comes with a ton of fun and useful software. It has an easy to read yet detailed manual, a 20 year auto-recharging battery and a 3 year no hassle warranty.

TIMEMASTER H.O.
SIMPLY PUT,
IT'S SIMPLY THE BEST **$129.00 Complete**

*If you purchased a Timemaster H.O. prior to AppleWorks support, an easy to use patch program is available for $20.00.

APPLIED ENGINEERING
We Set the Standard

Call (214) 241-6060 9 a.m. to 11 p.m., 7 days a week or
Send check or money order
P. O. Box 798
Carrollton, Texas 75006

MasterCard, Visa and C.O.D. welcome. No extra charge for credit cards.
Texas residents add 5⅛% sales tax.
Add $10.00 if outside U.S.A.

standard, you must first boot the DOS 3.3 System Master disk to install Integer BASIC on the language card (16K RAM card). When the Applesoft prompt (the] character) appears on screen, type INT to enter Integer BASIC. The prompt will change to a greater-than sign (>). Then type in CALL -151 to enter the Monitor. Finally, type F666G and press the return key. The prompt should change to an exclamation character (!), indicating that the mini-assembler is now active.

Using the Mini-Assembler

To enter a machine-language program using the mini-assembler, you must first tell the assembler where you want to start by typing the address, a colon, and the first assembly-language instruction. To create the program shown in **Listing 1**, type:

```
300: LDA #$C1
```

and press the return key. The screen reformats the text to print:

```
0300- A9 C1      LDA #$C1
```

This confirms that the information was interpreted correctly. At this point, you don't need to enter further memory locations—just the next instruction will do. To enter it, press the space bar once (this is required) and then type:

```
STA 5BC
```

and press the return key. The screen reformats to display:

```
0300- A9 C1      LDA #$C1
0302- 8D BC 05   STA $05BC
```

Notice that the dollar sign in front of an address or value is not required in the mini-assembler, and that the mini-assembler automatically puts each new instruction at the next available memory location. It assumes that all numbers used are in hex. Now type in RTS and press the return key.

To exit the mini-assembler, type in $FF69G. (On the //c or enhanced //e, pressing the return key alone will exit the mini-assembler.)

To list the program, type 300L. The screen should display a listing similar to the one in **Listing 1**. To test the program, return to Applesoft BASIC by typing FP and pressing the return key. Now type in HOME to clear the screen, followed by CALL 768 to call the routine. The letter A should appear in the center of the screen.

Assembler Fields

When creating an assembly-language program, you should always enter the information on each line of the source listing in a certain order. The computer then puts this information in a certain position, or *field*, to indicate what type of information it is. The mini-assembler is rather limited; it allows only three fields of information.

The first field is the address field; it specifies where the next instruction bytes will be placed. Following this comes the mnemonic for the instruction, and finally an *operand*. The operand is the number value or address (if any) the instruction will use.

In the mini-assembler, you can use the address field only when you start to enter a routine at a new location in memory. Once you enter the starting address, you can skip this field on successive instructions by typing just the space character followed by the next two fields.

The instruction field usually contains a mnemonic, but in more advanced assemblers, you can also place directives here. The instruction field always has a three-character mnemonic to indicate the desired instruction. Directives usually have three characters, but this can vary by assembler and for individual directives.

Many instructions allow several types of *operands* (meaning "the object of the operation") that affect how the instruction operates. Because most instructions deal with memory addresses, these variations are usually called addressing modes.

Last month provided an example of two of the most common *addressing modes*. In **Listing 1**, the second instruction, STA $5BC, tells the 6502 to store the content of the accumulator in location $5BC. This is called the *absolute* addressing mode, because the address is exactly specified, without modification. As you'll see later, the contents of other registers within the 6502 can modify addresses.

The first instruction, LDA #$C1, is called the *immediate* addressing mode, because the value is "immediately" available to the 6502—it doesn't have to look to another memory location to determine what to put into the accumulator. The instruction

BIBLE STUDY

JUST GOT EASIER!

NEW TESTAMENT CONCORDANCE-ONLY $49.50

- ★ ENTIRE NEW TESTAMENT ON ONLY 3 DATA DISKS
- ★ QUICKLY LOCATE VERSE REFERENCES FOR ANY NEW TESTAMENT WORD
- ★ COMPLETELY MACHINE LANGUAGE FOR ZIPPY PERFORMANCE
- ★ STORE VERSE LIST ON DISK FOR LATER USE
- ★ AUTOMATICALLY SORTS VERSE LIST BY CHAPTER AND VERSE
- ★ MULTIPLE WORD SEARCHES ALLOWED
- ★ ANY NUMBER OF CONTEXT VERSES MAY BE SPECIFIED
- ★ REMOVES THE DRUDGERY FROM BIBLE RESEARCH
- ★ IDEAL FOR SUNDAY SCHOOL CLASSES, SERMON PREPARATION, HOME BIBLE STUDY, AND SPEECH WRITING

FOR COMMODORE 64 AND APPLE IIe, IIc

Please Add $2.00 Per Order For Postage and Handling

SEND FOR OUR FLYER OF OTHER USEFUL SOFTWARE

MIDWEST SOFTWARE
Box 214 Farmington, MI 48024
VISA / MASTERCARD

ORDER LINE 9:00 A.M. - 5:00 P.M. **1-800-422-0095**

Michigan, and orders after 5:00 P.M. - (313) 477-0897

Circle 180 on Reader Service Card.

BackUp Utilities/Boards

E.D.D. III	44.00
CIA Files	47.00
Copy II Plus—Central Point	20.00
Locksmith 5.0—Omega	65.00
Nibbles Away III	59.00
Copy Master II 128K w/Gr. Dump	95.00
Wildcard II—Central Point	75.00

Entertainment

Adventure Construction Set	32.00
7 Cities of Gold or Skyfox	25.00
Murder on the Zinderneuf	14.00
Archon II or One-On-One	25.00
Pinball Construction Set	22.00
Carriers At War or Wilderness	34.00
Reach for the Stars or Bard's Tale	29.00
Europe Ablaze	32.00
Deja Vu	34.00
Racter	28.00
Stephen King's "The Mist"	25.00
James Bond: "A View To Kill"	25.00
Micro League Baseball	24.00
Capt. Goodnight & Islands of Fear	21.00
Gato	23.50
Ghost Busters or Pitfall II	23.50
Hacker or Space Shuttle	25.00
Aloazar or Master of the Lamps	25.00
Wizardry	29.00
Knight Of Diamonds	21.00
Legacy of Llylgamyn	24.00
Return Of Werdna	27.00
Rescue Raiders	22.00
Wisiprint	15.00
Super Zaxxon or Frogger 3 Deep	22.00
The Quest or Ring Quest	20.50
Expedition Amazon, or Xyphus	20.50
Sword of Kadash	20.50
Below The Root	20.00
Swiss Family Robinson	20.00
Millionaire, Tycoon, Barron or Squire	24.00
Solo Flight or Nato Commander	21.00
F-15 Strike Eagle or Acrojet	21.00
Gunship or Silent Service	21.00
Amazon or Dragon World	24.00
Fahrenheit 451 or Shadow Keep	24.00
Flight Simulator II	31.00
Championship Lode Runner	20.50
Choplifter! or Karateka	20.50
Pole Position or Zaxxon / / c	19.00
Bruce Lee, Conan, or Mr. Do	23.50
Murder By The Dozen or Felony	23.00
Kings Quest	30.00
Romancing The Throne	28.00
Beyond Castle Wolfenstein	20.00
Ultima III: Exodus or Ultima IV	34.00
Sargon III	30.00
A Mind Forever Voyaging	27.00
Cutthroats, or Seastalker	23.50
Hitchhiker's Guide to The Galaxy	23.50
Deadline, or Starcross or SpellBreaker	28.50
Witness, Planetfall, or Enchantor	23.50
Infidel or Sorceror	26.50
Zork II, Zork III, or Suspect	26.50
Zork I or Wishbringer	23.50
Operation Market Garden	30.00
Objective Kursk or Phantasie	23.50
War In Russia	47.50
50 Mission Crush or Broadsides	23.50
Kampfgruppe or Reforger 88	35.50
Imperium Galactum	23.50
Germany 1985 or Carrier Force	35.50
Baltic 85 or Gemstone Warrior	20.50
Geopolitique 1990 or Rails West	23.50
North Atlantic '86	35.50
Battle For Normandy	24.00

Utility Software

Apple Mechanic	17.00
Beagle Basic	20.00
Beagle G.P.L.E.	27.00
Beagle Graphics	32.00
D-Code	22.00
Disk Quick	16.00
Dos Bos	13.00
Double Take	19.00
Extra K	22.00
Fat Cat	19.00
Flex Text	16.00
Frame Up	16.00
I.O. Silver	16.00
Pro-Byter	19.00
Pronto Dos	16.00
Silicon Salad	13.00
Triple Dump	21.00
Typefaces	10.00
Utility City	16.00
Bag of Tricks	25.00
Applesoft Compiler (Microsoft)	108.00
Lisa V2.6	53.00
Merlin Pro	57.00
Merlin Assembler	35.00
Merlin Combo Pack	64.00
Apple II Instant Pascal	105.00
Apple Pascal 1.2	199.00
Turbo Pascal 3.0	38.00
Turbo Tool Box	32.00
Visible Computer: 6502	29.00
The Graphics Magician	35.00
New Complete Graphics Sys.	47.00
Fantavision	32.00
Movie Maker	26.00
Dazzle Draw	37.00
Prince (C.Itoh or Epson)	46.00
Pix-It	30.00
Take 1	35.00
Blazing Paddles	30.00
Sideways	35.00
Fontrix 1.5	55.00
Font Paks 1-13 ea.	11.50
DMP Utilities—(Vilberg Bros.)	Call
AppleWorks Modifier 64K	39.00
AppleWorks Modifier 128K	49.00

Blank Media

Elephant SS/DD (10)	11.95
Maxell SS/DD (10)	13.95
Verbatim SS/DD (10)	13.95
BASF SS/DD (10)	10.95
Memorex SS/DD (10)	13.50
3M SS/DD (10)	16.95
Dysan SS/DD (10)	22.95

Business Software

Advanced Logic Systems	
SpellWorks	32.00
Apple Access / / (/ /e, / /c only)	59.00
Apple Works (/ /e, / /c only)	179.00
Apple Writer / / (/ /e, / /c only)	117.00
Quickfile (/ /e, / /c)	75.00
Advanced Logic Systems	
The Handlers (II+, / /e, / /c)	97.00
Applied Software Technology	
Versaform / /e, / /c	45.00
Artsci MagiCalc ProDos	79.00
Magic Office System	125.00
Magic Window II	79.00
BPI Systems	
General Accounting Dos 3.3	199.00
AR, AP, PR or Inv. Dos 3.3 (ea.)	199.00
General Accounting ProDos	219.00
AR/AP/PR or Inv. ProDos (ea.)	219.00
Continental Software F.C.M./FL	58.00
G/L, A/R, A/P, Payroll ea.	133.00
Home Cataloger	30.00
Creative Peripherals	
Time Trax / /e or / /c Version	79.00
Time Trax / /c System Clock Only	55.00
Dow Jones Software	
Investor's Workshop	89.00
The Market Analyzer	199.00
The Market Microscope	199.00
Dow Jones Membership Kit	19.00
Hayden Software	
Pie Writer V2.2	89.00
Human Edge Software	
Communications Edge	88.00
Management Edge	88.00
Mind Prober	29.00
Sales Edge	88.00
Kensington Microware	
Format II Enhanced	88.00
Living Videotext	
Think Tank II+ or / /e	79.00
Megahaus ReportWorks	69.00
MegaWorks	69.00
Microsoft	
Microsoft Softcard w/dBase II	315.00
Multiplan (Apple Dos Version)	59.00
Microstuff Crosstalk	105.00
Nolo Press Will Writer	29.00
Organizational Software	
Omnis 3	229.00
Paladin Flashcalc	59.00
PBI Software Graphworks 1.2C	59.00
Jeeves	39.00
Peachtree	
Back To Basics: GL/AR/AP	105.00
Pinpoint Publishing Pinpoint	45.00
Practicorp Practicalc II	31.00
Precision Software SuperBase	59.00
Quark Catalyst / /e	95.00
Terminus / /e	55.00
Word Juggler & Lexicheck / /e	65.00
Roger Wagner Publishing	
Mouse Write	75.00
Satellite Software Wordperfect	85.00
Sensible Software	
Bookends—ProDos	79.00
Graphics Department	69.00
The Sensible Speller—Dos or ProDos	69.00
Sierra On-Line	
General Manager II	129.00
Screenwriter Professional	78.00
Software Arts	
The VisiCalc Package	99.00
Software Publishing	
PFS:Best Sellers	145.00
PFS: First Success	135.00
PFS:File, Graph, Report	69.00
PFS:Write or Plan (/ /e, / /c)	69.00
PFS:Access (/ /e, / /c)	42.00
Sorcim/IUS SuperCalc 3a	105.00
State of the Art	
Electric Checkbook	59.00
GL/AR/AP/Inventory/Payroll	289.00
Stoneware	
DB Master Business Team	189.00
DB Master Business Writer	89.00
DB Master Version Four Plus	169.00

Educational Software

Apple	
Apple Logo / / 128K (/ /e, / /c only)	75.00
Baron's Computer SAT	53.00
CBS Software Adventure Master	26.00
America Coast to Coast	24.00
Dinosaur Dig	24.00
Forecast or T-Rex	28.00
Goren's Bridge	49.00
Mastering The SAT	59.00
Micro Speed Reading	59.00
Success w/Algebra (ea.)	21.00
Success w/Math (ea.)	15.00
Davidson & Associates	
Alge-Blaster	29.00
Classmate or Math Blaster	29.00
Speed Reader II	41.00
Speed Reader Data A, B, C, or D	12.00
Spell-It or Word Attack!	29.00
Designware Body Transparent	26.00
European Nations & Locations	26.00
Grammer Examiner	26.00
Remember	47.00
States & Traits	26.00
DLM	
Alligator Mix or Demolition Division	20.25
Freddie's Puzzles or Number Farm	19.00
Spelling Wiz or Word Invasion	20.25
Harcourt Brace Computer SAT	46.00
Learning Company	
Addition Magician	21.00
Bumble Plot or Reader Rabbit	24.00
Gertrude's Puzzles or Secrets	26.00
Juggle's Rainbow	18.00
Magic Spell or Word Spinner	21.00
Robot Odyssey or Rocky's Boots	29.00
MECC All Titles in Stock!	Call
Peachtree/Eduware	
Algebra 1, 2, 3, or 4	22.00
Algebra 5 or 6	27.00
Compu-Read	17.00
Compu-Math: Arithmetic Skills	29.00
Introduction to Counting	24.00
PSAT or SAT Word Attack Skills	17.00
PSAT/SAT Analogy	18.00
Spelling Bee w/Reading Primer	23.00
Writing Skills 1, 2, 3, 4 or 5	24.00
Scarborough Systems	
Mastertype's Writing Wizard	48.00
Build A Book About You	24.00
Original Boston Computer Diet	48.00
Run for the Money or SongWriter	24.00
Scholastic Wizware	
Agent U.S.A. or Turtle Tracks	24.00
Operation: Frog or Logic Builders	24.00
Logo Robot or Kids at Work	15.00
Simon & Schuster	
JK Lasser Money Manager	59.00
Spinnaker	
Adventure Creator or Trains	21.00
Aerobics or Snooper Troops	20.00
Counting Parade or Sum Ducks	21.00
Delta Drawing	28.00
File & Report or Spreadsheet	35.00
Fraction Fever	15.00
Grandma's House	15.00
In Search Of....	20.00
Kidwriteror Alphabet Zoo	18.00
Kindercomp or Kids on Keys	15.00
Treasure Island or Wizard of Oz	19.00
Word Processor	35.00
Springboard	
Early Games or Music Maestro	21.00
Fraction Factory or Make a Match	18.00
Rainbow Painter or Puzzle Master	21.00
Newsroom	29.00
Newsroom Clip Art Collection	17.00
Terrapin Terrapin Logo	57.00
TimeWorks	
Evelyn Wood Dynamic Reader	41.00
Xerox Chivalry	32.00
Exploring Tables & Graphs 1 or 2	23.00
Pic.Builder	24.00
Stickybear Series (ea.)	24.00

Modems

Volksmodem 12	169.00
Anchor Signalman Express	239.00
Apple Personal Modem	289.00
ERA 2 by Microcom	289.00
Hayes Micromodem / /e	129.00
Hayes 300 Baud Smartmodem / /c	155.00
Hayes 300 Baud Smartmodem	129.00
Hayes 1200 Baud Smartmodem	365.00
Hayes 2400 Baud Smartmodem	579.00
Novation 2400 Baud Standalone Modem	479.00
Novation Apple Cat II	189.00
Novation 212 Apple Cat II	359.00
Popcom X-100 (1200 Baud)	265.00
Pro Modem 1200 (External)	295.00
Pro Modem 1200A (Internal)	269.00
Pro Modem 300c	129.00
U.S. Robotics Password 1200	199.00
U.S. Robotics Courier 2400	389.00
Zoom/Modem / /e	115.00
Zoom/Modem / /e Plus	125.00

Z80/80 Col./Ramcards

Applied Engineering: RamWorks	Call
Applied Engineering: Z-RAM / /c	Call
Checkmate—Multiview 80/160	219.00
Checkmate—Multiram Cards	Call
Quadram Multicore Card	Call
Quadram E-Ram 80	99.00
Apricorn 16K Ramcard II+	68.00
Saturn 128K Ram	175.00
Neptune 80 Col. 64K Card	185.00
Apricorn 64K Extend-It	89.00
Extend 80 (Caribbean Computer)	79.00
Micro Sci 80/64e	69.00
Videx Videoterm w/SS Inv.	178.00
Videx Ultraterm	189.00
ALS Z-Engine 2.2	125.00
Microsoft Premium Softcard / /e	249.00
Microsoft Softcard II	269.00
MTC Speed Demon	159.00
Accellerator / /e	205.00

Interface Cards

Apple Super Serial Card	109.00
SeriAll Interface Card	105.00
AST Multi I/O	155.00
Serial Grappler Plus	75.00
Grappler+	74.00
Buffered Grappler+	135.00
Grappler / /c	78.00
Nice Print (Spies Labs)	109.00
Finger Print Plus	98.00
Print-It! (Parallel or Serial)	129.00
Pkaso/U Interface	115.00
Video 7 RGB Interface / /c	95.00
Video 7 64K RGB Interface / /e	129.00
Video 7 Color Enhancer / /e, / /c	Call
Video 7 Screen Enhancer / /e, / /c	Call

Accessories

Kensington System Saver	60.00
Cool+Time	69.00
Curtis Diamond	30.00
Curtis Emerald	36.00
Curtis Ruby	54.00
Curtis Sapphire	47.00
Apple Mouse / /e	115.00
Apple Mouse / /c	79.00
Hayes Mach II Joystick	27.00
Hayes Mach III Joystick	33.00
Kraft Quickstick / /c	49.00
Kraft Joystick	31.00
Gibson Light Pen	149.00
Digital Paintbrush System	175.00
Muppet Learning Keys	42.00
Koala Pad Plus	72.00
Key Tronic Keyboard	225.00
Trackhouse Keypad	79.00
Mockingboard A Board	71.00
Mockingboard C Board	121.00
Mockingboard D Board (/ /c)	131.00
Echo II Plus	94.00
The Cricket / /c	115.00
Thunderclock Plus	105.00
Hanzon Universal Data Buffer	289.00

Printers

Apple	
ImageWriter II Color Printer	459.00
ImageWriter (Wide Carriage)	475.00
Scribe Printer	195.00
Brother HR-15XL	349.00
HR-25	469.00
HR-35	679.00
TwinWriter 5	859.00
Fortis/Dunax	
DH45 Dual Head Printer	859.00
Citizen MSP-10 (160 cps)	275.00
MSP-15 (160 cps)	375.00
MSP-20 (200 cps)	Call
MSP-25 (200 cps)	525.00
C.Itoh ProWriter 8510 AP Plus	319.00
ProWriter 1500 BP Plus	455.00
Epson	
LX-80/90	Call 209.00/259.00
FX-85	For Call
FX-185	Most Call
DX-10/20	Recent Call
JX-80	Low Low! Call
LQ-1500	Prices! Call
Hewlett-Packard ThinkJet	Call
LazarJet	Call
Juki 6100P	355.00
6300P	679.00
Mannessman Tally	
MT-85 Apple	345.00
MT-86 Apple	415.00
NEC SpinWriter e.l.f.360	379.00
SpinWriter 2030P (20 cps)	625.00
SpinWriter 3530P (35 cps)	989.00
PinWriter P2-2P (180cps)	495.00
PinWriter P3-3P (180cps)	695.00
Okidata Okimate 20 Color Printer	199.00
Microline 182P	215.00
Microline 183P	Call
Microline 192P	339.00
Microline 193P	475.00
Microline 192 Apple	369.00
Microline 193 Apple	555.00
Panasonic KXP-1091	239.00
KXP-1092	365.00
KXP-1093	429.00
KXP-3151	405.00
Silver Reed EXP-400P	215.00
EXP-500P	244.00
EXP-550P	375.00
EXP-770P	679.00
Star Micronics SG-10 (120 cps)	219.00
SG-15 (120 cps)	379.00
SD-10 (160 cps)	339.00
SD-15 (160 cps)	449.00
SR-10 (200 cps)	489.00
SR-15 (200 cps)	585.00
Toshiba P-1340 Parallel	489.00
P-341 Parallel	899.00
P-1351 Parallel	989.00
P-351 Parallel	1039.00

Disk Drives

Apple	
ProFile (5 Meg) w/Accessory Kit	779.00
ProFile (10 Meg) w/Access. Kit	1039.00
Apple / /c External Drive	229.00
Apple DuoDisk w/Accessory Kit	449.00
Apple UniDisk w/Controller	269.00
Corvus Systems	
OmniDrive Hard Disks	Call
Gamma FD 100c	169.00
Micro Sci A2 Full Height	159.00
A5 Slimline / /e	159.00
A5 Slimline / /c	165.00
Micro Sci C2 Controller	49.00
Mitac AD-3C Slimline / /e or / /c	129.00
Pico Products	
Apple Half-Height II+,/ /e, / /c	139.00
Quark	
QC-10 Hard Disk / /e, / /c or Mac	1029.00
QC-20 Hard Disk / /e, / /c or Mac	1379.00

Monitors

Amdek	
Video 300G 12" Green Monitor	115.00
Video 300A 12" Amber Monitor	119.00
Color Monitor 300 (Composite)	219.00
Color Monitor 500 (RGB)	255.00
Color Monitor 600 (RGB)	385.00
DVM III RGB Interface	119.00
Apple Color Monitor / /e	289.00
Color Monitor / /c	289.00
Panasonic	
TR120M1 Hi-Res Green	119.00
TR120MD Hi-Res Amber	125.00
DTS101 Dual Mode Color 10"	189.00
DTH103 10" Super Hi-Res RGB	369.00
DTM140 14" Super Hi-Res RGB	389.00
Princeton Graphics HX-9	409.00
HX-12 RGB	439.00
RGB-80 Interface	145.00
Teknika	
MJ-22 RGB Color Monitor	299.00
Sakata SG-1000 Green	94.00
SA-1000 Amber	115.00
SC-100 Composite Color	Call
SC-200 RGB Color	379.00
Taxan 115 12" Hi-Res Green	115.00
116 12" Hi-Res Amber	119.00
220 14" Composite Color	239.00
420 12" Hi-Res RGB Color	385.00
410-80/64 RGB-II Interface	169.00

Home Software

Home Accountant	39.00
Dollars and Sense (II+, / /e)	58.00
Dollars and Sense (/ /c)	68.00
Monogram Forecast (64K or 128K)	38.00
Time Is Money	59.00
Money Street	75.00
Networth	48.00
Financial Cookbook	32.00
Cut and Paste	24.00
The Write Choice	27.00
Bank Street Writer	41.00
Bank Street Speller	41.00
Bank Street Filer	41.00
Homeword	42.00
Homeword Speller	31.00
ASCII: Express Professional	76.00
Softerm II	124.00
Compuserve Starter Kit	15.00
Typing Tutor II	15.00
Typing Tutor III	31.00
Master Type	24.00
Crossword Magic	31.00
Micro Cookbook (II+, / /e)	23.00
Music Construction Set	25.00
Print Shop	28.00
Print Shop Companion	25.00
Print Shop Graphics Library I or II	15.00
Rainbow Paper Pak (300 Sheets)	12.00

Ordering Instructions

VISA AND MASTERCHARGE ACCEPTED For fast delivery send cashier's check, certified check or money order. Fortune 1000 & Government checks honored immediately—Personal and other company checks allow 3 weeks to clear. Mastercard & Visa include card # & expiration date. Connecticut residents add 7.5% sales tax. We ship same day for most orders.

Shipping Charges: Software—$2.50 Minimum charge U.S. Mainland. With C.O.D. shipments add an additional $1.90 U.S. postal, APO, and FPO add 3% ($5.00 Min.). Alaska or Hawaii add 6% ($10.00 Min.). Canadian orders add 10% ($15.00 Min.). Foreign Orders except Canada—Add 18% ($25.00 Min.).

Hardware—please call for shipping charges.

Note: We do not guarantee machine compatibility. All products are new and include factory warranty, therefore ALL sales are final. Defective software will be replaced by the same item only. Defective hardware will be replaced or repaired at our discretion. Prices & availability subject to change without notice. Products purchased in error, subject to 15% restocking fee. All returns must have an authorization number. Call (203) 378-3662 to obtain one before returning defective products for replacement.

For items not listed just call:

Visit Our New Showroom: Exit 32 off I-95

PROGRAMS PLUS

Visit Our New Showroom: Exit 32 off I-95
Stationhouse Square, 2505 Main Street
Stratford, Connecticut 06497
Mon.-Fri. 9-9; Sat. 10-9
Inquiries & Conn. residents call:
(203) 378-3662 or 378-8293

ORDERS ONLY TOLL FREE **1-800-832-3201**

MACINTOSH COMPUTERS ..... Call
APPLE / /c, / /e COMPUTERS Call

Up to 60% off retail

Table. A few instructions and their addressing modes.

Instruction	Function	Example Addressing Modes
LDA	Load the accumulator	LDA #$C1 (immediate) LDA $C1 (absolute)
STA	Store the content of the accumulator somewhere	STA $C1 (absolute) (immediate not available)
RTS	Return from the subroutine	RTS (implied only)

RTS also has an associated addressing mode. This *implied* addressing mode is associated with instructions where the addressing mode is obvious, usually because of the lack of one!

You have to learn about 50 main instructions in 6502 assembly language—just about half as many as the number of key words in Applesoft BASIC. One or more of eight different addressing modes can be associated with each of these 50 instructions. Combining instructions and addressing modes gives you a complete set of tools with which to create a powerful program. Don't worry that you'll have to learn 50 times eight (400) commands; it's more like learning just 58.

Before proceeding with the mini-assembler, review the instructions and addressing modes you're familiar with so far, summarized in the accompanying **Table**.

The JSR Instruction

To experiment further, you'll need to learn a new instruction. I mentioned that you use RTS to return from the machine-language program. This instruction performs the same function as a RETURN in Applesoft BASIC. As it happens, machine language has an equivalent of Applesoft's GOSUB command, as well. The mnemonic for this command is JSR, which stands for Jump to SubRoutine. You can use this instruction within any assembly-language program to call other subroutines within the program itself, or better yet, to call subroutines within the Monitor or the Applesoft BASIC machine-language routines.

In the October issue of this column (p. 68), I presented a number of machine-language routines built into Applesoft that you can call from normal Applesoft programs. A variation on this is to call the routines directly from your own assembly-language programs. As an example, **Listing 1** looks much better if you do a HOME first. Why not have the program itself clear the screen before printing the letter A on screen?

Writing a subroutine yourself to clear the screen would be quite advanced at this point, but fortunately one already exists in the Monitor. Location $FC58 is the *entry point*, or starting address, for this routine; so, by simply adding the line JSR $FC58 to the beginning of your program, you can make it clear the screen (40 or 80 columns!) for you.

Reactivate the mini-assembler as discussed above, and type in:

```
0300: JSR FC58
```

followed by the next three instructions in **Listing 1**, as described earlier. Remember to type a space before each new instruction and to quit the mini-assembler after entering the RTS instruction. The final listing should look like **Listing 2**.

After exiting the mini-assembler, try the routine by typing 300G, then pressing the return key. The screen should clear before printing the letter A. Believe it or not, you have just taken what is probably the most important and powerful step in writing your own programs. Using existing

Continued on p. 114

Listing 2. Machine-language program that clears the screen before it prints the letter A.

```
0300-  20 58 FC    JSR $FC58
0302-  A9 C1       LDA #$C1
0304-  8D BC 05    STA $05BC
0307-  60          RTS
0308-  ??
0309-  ??
```


BACKUP PROTECTED SOFTWARE with COPY II PLUS™ ver. 5

From the team who first brought you **COPY II PLUS** in 1981 comes a completely updated disk backup utility for your Apple // computer. New features include:

- **Fully automatic bit copy*.** All parameters are stored on disk. Simply type in the name of the program you wish to backup, and **COPY II PLUS** does the rest!
- **New utilities** including Alphabetize Catalog, Fast 2-pass Disk Copy on a //c or //e, and an all-new Sector Editor.
- **Supplied on a standard DOS** diskette. Runs on the Apple //, Apple //+, Apple //e, Apple //c. Requires 64K and one or two disk drives.

Increase the power of your Apple //...
Use **COPY II PLUS™ 5.0**

Call M-F 8-5:30 (W. Coast time) with your VISA MasterCard : **503/244-5782.**
Or send a check (add $3 s/h, $8 overseas) to

$39.95

CENTRAL POINT Software, Inc.
9700 SW Capitol Hwy. #100
Portland, OR 97219

* We update Copy II Plus regularly to handle new protections; you as a registered owner may update at any time for 1/2 price! (To update, just send original disk and $20.)

This product is provided for the purpose of enabling you to make archival copies only.

They're talking a blue streak about Value Line's New Investment Software.

"VALUE/SCREEN is a fast fundamental analysis screening package that can save you hundreds of hours in screening and analysis time . . . It is a powerful and flexible program. . ."
PC MAGAZINE (July 10, 1984)

"I recommend this program to . . . anyone . . . who wants the ability to sift easily and rapidly through large amounts of monthly stock market statistical data."
FINANCIAL AND INVESTMENT SOFTWARE REVIEW (January/February 1984)

". . . saves me *2 days* work per week."
Business Consultant, McAllen, Texas

". . . it makes perfect sense that Value Line should have sought to boil down its database into a package that could run on a personal computer. This is just the kind of information that makes VALUE/SCREEN particularly valuable. . ."
WALL STREET COMPUTER REVIEW (August/September 1984)

"It is so user-friendly. It is almost impossible to make an error."
Money Manager, Carlisle, Mass.

". . . I found the program interesting and useful. . ."
COMPUTERIZED INVESTING (April, May 1984)

VALUE/SCREEN: The only investment software you'll ever need.
Stock Selection * Regular Data Disk Updates * Stock Reports * Portfolio Management

---

Get VALUE/SCREEN Today!

I want VALUE/SCREEN!

☐ I'd like the $39 trial offer, which includes complete documentation, program disk, and a current data disk — PLUS the next monthly updated data disk.

☐ I'd like an immediate 12-month subscription to VALUE/SCREEN with
☐ 12 monthly data disks for $348 or ☐ 4 quarterly data disks for $211.

Tax deductible if used in managing your investments. Purchase is nonassignable. NY residents add sales tax.

Personal computer equipment:
☐ IBM ☐ Apple II series, 80-column display recommended.

☐ My check for $ _____ is enclosed. ☐ Please bill my ☐ American Express ☐ MasterCard ☐ Visa

Account # _____ Exp. Date _____

Name _____ Signature _____

Address _____ City _____ State _____ ZIP _____

Value Line, Inc. 711 Third Avenue NY, NY 10017 Dept 548HO1

Circle 197 on Reader Service Card.

The Sequel to an Exciting Software Premiere. . .

hotCider VOLUME II

More Of The Very Best Ready-to-run Apple II* Programs From inCider

Available now. . . a second incredible collection of ***inCider*** magazine's best programs. ***hotCider Vol. II!***

Get a dozen ready-to-run programs for the Apple II on a high-quality, menu driven floppy disk. Programs for business, home management, education, entertainment, and graphics! No tedious typing or debugging to worry about! And it comes complete with its own documentation booklet.

What A Menu!

Just like the exciting Vol. I, *hotCider Vol. II* is loaded with all-time *inCider* favorites:

"Should I Trade?"—Tells you the Real cost of buying a new car.

"Low-Res to Hi-Res"—Shows you how to easily convert your lo-res pictures to hi-res.

"Modem Battleship"—Dial up a friend and use your modem to play this latest version of Battleship.

Plus, more utilities, games, and educational programs!

Vol. I— Still Available!

If you haven't ordered your *Volume I* yet, the premiere issue of *hotCider* is still available in limited quantities!

Enjoy such standouts as;

"VisiData"—A list handler that works like a spreadsheet.

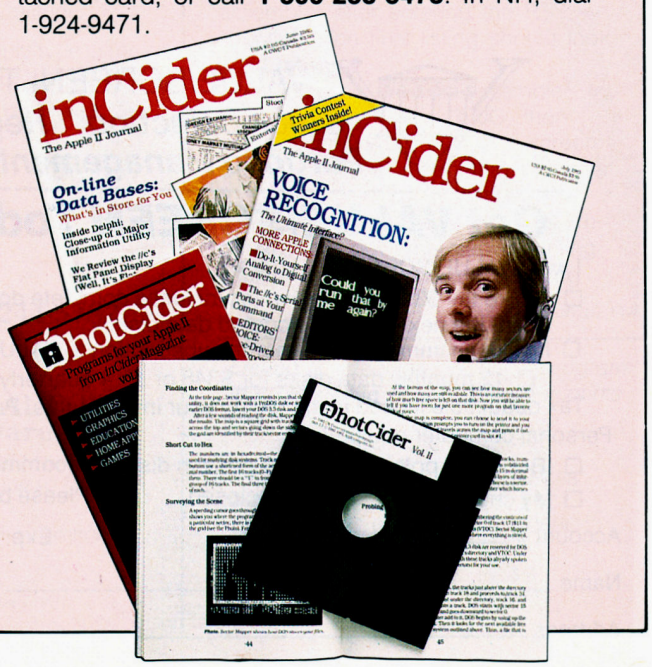
"Poster Printer"—Say anything in a BIG way with your printer.

"Doing Windows"—Learn how to create Macintosh-style windows on your Apple II.

hotCider Vol. I also gives you three previously unpublished *bonus programs,* including "Cider Zap" (a full-fledged editing utility)!

Easy To Use, Easy To Order

There's no easier way to build a versatile software library than with *hotCider Vol. I and Vol. II.* To order your copies, return the coupon or attached card, or call **1-800-258-5473**. In NH, dial 1-924-9471.



YES! I want the very best ready-to-run programs from inCider.

Send me hotCider on disk for $21.47**.

☐ hotCider Vol. II ☐ hotCider Vol. I

☐ Payment enclosed ☐ AE ☐ Visa ☐ MC

Card # _____ Exp. date ____

Signature _____

Name _____

Address _____

City _____ State ____ Zip _____

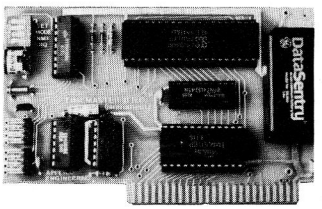
* Apple and the Apple logo are registered trademarks of Apple Computer, Inc.

** Prices include postage and handling. Foreign airmail please add $1.50 per item. US funds drawn on US banks only. **12-85**

hotCider • 80 Pine Street • Peterborough, NH • 03458

Designed For Those Who Only Accept The Best!

TIMEMASTER II H.O.™



- Absolutely, positively, totally PRO-DOS and DOS 3.3 compatible.
- Time in hours, minutes, seconds and milliseconds (the ONLY PRO-DOS compatible card with millisecond capability).
- 24 hour military format or 12 hour with AM/PM format.
- Date with year, month, day of week and leap year.
- Eight software controlled interrupts so you can run two programs at the same time (many examples are included).
- The only card recognized by both the DOS 3.3 and PRO-DOS versions of Apple Writer IIe.
- Appleworks will now time and date stamp all your data automatically.
- The only clock card that will display the time and date on the Appleworks screen.
- Compatible with ALL of Apple's languages. Many sample programs for machine code, Applesoft, CP/M and Pascal on 2 disks.
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.
- Auto-recharging nickle-cadmium battery will last over 20 years.
- Two BSR/serial ports for future expansion.

	PRO-DOS COMPATIBLE	INCLUDES DOS DATER	MILLISECOND TIME	YEAR DATA	LARGEST SAMPLE SOFTWARE	REMOTE SET PORT	BSR PORT	EMULATES ALL OTHER CLOCKS
H.O	YES	YES	YES	YES	YES	YES	YES	YES
BRAND A	NO	NO	YES	NO	NO	NO	NO	NO
BRAND C	NO	NO	NO	NO	NO	NO	NO	NO
BRAND M	NO	NO	NO	NO	NO	NO	NO	NO
BRANDP	YES	YES	NO	YES	NO	NO	NO	NO
BRAND S	NO	NO	NO	YES	NO	NO	NO	NO
BRAND T	YES	NO	NO	NO	NO	NO	YES	NO

Full emulation of all other clocks. Yes, we emulate Brand A, Brand T, Brand P, Brand C, Brand S and Brand M too. It's easy for the H.O. to emulate other clocks, we just drop off features. That's why the H.O. can emulate others, but none of the others emulate us. The Timemaster II H.O. will automatically emulate the correct clock card for the software you're using. Of course most programs will use the Timemaster II H.O. in its native mode, but it's comforting to know that you won't have to worry about compatibility problems. You can also give the H.O. a simple command to tell it which clock to emulate. This is great for writing programs for those poor unfortunates who bought some other clock card.

REMOTE CONTROL

Our BSR X-10 interface option for the H.O. allows you to remotely control up to 16 lights and electrical appliances through your BSR X-X-10 home control system in your home or office. You're already wired because a BSR system sends its signals over regular 120 volt wiring. That means you can control any electrical device in your home or office without additional wiring.

CLOCK PRICE $129.00 **BSR Option (may be added later) $49.00**

VIEWMASTER 80™

There used to be about a dozen 80 column cards for the Apple. Now there is only ONE.

- TOTALLY Videx Compatible.
- Perfect for any APPLE II, II+ or IIe.
- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override.
- Fully compatible with ALL Apple languages and software—there are NO exceptions.
- Low power consumption through the use of CMOS devices.
- All connections are made with standard video connections.
- Both upper and lower characters are standard, with true descenders.
- All new design (using a new Microprocessor-based C.R.T. controller) for a beautiful razor sharp display.
- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

	PRICE	BUILT-IN SOFTSWITCH	LOW POWER DESIGN	80 COLUMN HOME	7X9 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERRIDE	INVERSE CHARACTERS
VIEWMASTER	139	YES	YES	YES	YES	YES	YES	YES
SUPRTERM	MORE	NO	NO	NO	NO	NO	YES	YES
WIZARD 80	MORE	NO	NO	NO	YES	NO	YES	YES
VISION 80	MORE	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	NO	NO	NO	NO	YES	YES
VIEWMAX 80	MORE	YES	NO	NO	YES	NO	NO	YES
SMARTERM	MORE	YES	NO	NO	NO	YES	YES	NO
VIDEOTERM	MORE	NO	YES	NO	YES	YES	NO	YES

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, Easywriter, Apple Writer II, VisiCalc, Dollars and Sense, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

PRICE $139.00

Z-80 PLUS™
Now Includes New 4.0™ Software

Enter the CP/M world with the new Z-80 Plus card from Applied Engineering and introduce your Apple to thousands of new programs. Only the Z-80 Plus comes standard with the new 4.0 software, the most advanced system for running CP/M programs ever. Only CP/AM 4.0™ has advanced features like built-in disk emulation for popular memory expansion boards (those made by Apple and Applied Engineering and others) to give you a faster system with more storage. You also get menu driven utilities that are much easier to use than the older CP/M utilities so you can get down to all that great CP/M software faster. The Z-80 Plus runs older CP/M programs too, down to Version 1.6 (2.2 is the most popular). With the Z-80 Plus you can run the largest body of software in existence, and the Z-80+ is the only card on the market capable of accessing more than 64K in an Apple IIe. If you have an extended 80 column card, all 128K is usable, and if you have Ramworks, up to 1088K is available to CP/M. And each Z-80+ includes our CP/M Ram Drive software, enabling IIe owners to use an extended 80 column card, or a Ramworks card as an ultra-fast Ram disk enabling CP/M software to run 10 to 20 times faster. So fast acting software like WordStar, and dBASE II become virtually instantaneous! Simply plug the Z-80 Plus into any slot in your Apple. You'll have two computers in one and the advantages of both, all at an unbelievably low price.

- TOTALLY compatible with ALL CP/M software.
- Fully compatible with most hard disks including the Sider and Corvus.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
- Runs WordStar, dBASE II, Turbo Pascal, Fortran-80, Peachtree and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and low parts count allows the Z-80 Plus to fly through CP/M programs at a very low power level. (We use the Z-80B at a fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

PRICE $139.00

Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products work in Apple IIe, II, II+ and Franklin. Applied Engineering also manufactures a full line of data acquisition and control products for the Apple; A/D converters and digital I/O cards, etc. Please call for more information. All our products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle **THREE YEAR WARRANTY.**

Call (214) 241-6060, 9 a.m. to 11 p.m. 7 days a week or send check or money order to P.O. Box 798, Carrollton, Texas 75006. MasterCard, Visa and C.O.D. welcome. No extra charge for credit cards. Texas residents add 5⅛% sales tax. Add $10.00 if outside U.S.A.

APPLIED ENGINEERING
"We Set the Standard"

Continued from p. 110.

routines lets you create programs with significant capabilities without your having to know how to write all the subroutines required in their operation.

Using Built-in Subroutines

When calling a subroutine, you should consider three things. First, you should know the routine's location, usually called the *entry point.*

Second, you need to know the *entry condition.* Many routines perform a specific function, such as clearing the screen. Others vary their performance based on information passed to them when they are called. In Applesoft, you use variables to store and transfer information. In machine-language programs, it's the contents of various memory locations that are important. The entry conditions for a routine are usually defined in terms of what the routine expects to find in certain memory locations and 6502 registers such as the accumulator. You can control many routines by setting just a few of these locations or registers.

The third consideration is the *exit condition.* Many routines destroy not only the contents of the memory locations they use, but the contents of others, as well. Some routines use the exit condition to pass information *back* to the calling program. In coordinating the interaction of two or more subroutines, it is useful to know in what condition they will leave memory (the exit condition), as well as how things should start out (the entry condition).

Some Useful Subroutines

As an example of how a built-in subroutine can perform a useful task, use the routine PRBYTE (for PRint a BYTE) to create a hexadecimal conversion program. This will also illustrate how you can combine a machine-language routine with an Applesoft program to create a useful hybrid.

To create the subroutine, enter the mini-assembler as described before, and type in:

```
0300: LDA 06
```

and press the return key. Then type a space followed by:

```
JSR $FDDA
```

and press the return key and the space bar and type RTS. Then exit the mini-assembler. The screen should display **Listing 3**.

Listing 3. PRBYTE subroutine.

```
0300-  A5 06      LDA $06
0302-  20 DA FD   JSR $FDDA
0305-  60         RTS
0306-  ??
0307-  ??
```

To save this routine (the object code) to disk, you need to know the starting address and the length of the data to be saved. In this case the routine starts at location $300 and has a length of 6 bytes (remember to count zero). To save the object code, type in BSAVE PRINT.HEX,A$300,L$6 and press the return key.

Next type in FP to return to Applesoft BASIC; then type in **Listing 4**. Save the Applesoft program to disk under the name PRINT.HEX.BASIC.

Listing 4. Hex conversion program.

```
0 REM HEX CONVERT PROGRAM
5 PRINT CHR$(4);"BLOAD
  PRINT.HEX,A$300"
10 HOME
20 INPUT "DECIMAL NUMBER TO
   CONVERT:";N
25 IF N = 0 THEN END
30 IF N < 0 OR N > 255 THEN 10
40 POKE 6,N: REM STORE NUMBER
50 CALL 768: REM PRINT HEX
   NUMBER
60 PRINT: GOTO 20
```

When you run this program, it loads the object code from disk, asks what number you want converted, and then prints the hexadecimal equivalent of that number on the screen. Enter a value of zero to exit the program.

PRBYTE is a nifty Monitor routine that your computer uses whenever it prints hexadecimal bytes on the screen (such as when LISTing a portion of memory). The routine starts at $FDDA (the entry point), and prints the content of the accumulator as a hexadecimal number (the entry condition). On return from the routine, the content of the accumulator will have changed (exit condition).

Free Catalog!

Your 80-page guide to computer supplies and accessories–including complete new product descriptions.

- Packed with over 1600 products for microcomputers, minicomputers, and word processors – many available nowhere else.
- Big special section devoted to new supplies and accessories.
- Comprehensive product descriptions – including more than 475 full-color photos – clearly explain features and benefits.
- Easy-to-use cross reference guides to magnetic media, ribbons, and more–along with the industry's most complete cable guide.
- Helpful suggestions and tips, ranging from flexible disk care to proper ribbon selection to useful application ideas.

Phone toll-free 1-800-547-5444

inmac™

Phone toll-free 1-800-547-5444 or send coupon today.

Inmac Catalog Dept.
2465 Augustine Drive
Santa Clara, CA 95054

Please rush my free copy of the Inmac Catalog. I understand there is no obligation whatsoever.

NAME
COMPANY
ADDRESS
CITY
STATE ZIP PHONE

FEATURES:*	Better Working™ WORD PROCESSOR	PFS®: WRITE	APPLE WRITER II
50,000 word spellchecker	✓	O	O
On-screen view mode	✓	O	O
Window-based menus	✓	O	O
Personalized user dictionary	✓	O	O
SUGGESTED RETAIL	**$59.95**	$125.00	$150.00

No wonder we call it Better Working.™

The facts are in.

And as you can see from our little chart, the Better Working™ WORD PROCESSOR not only offers some important and useful advantages, it offers them for considerably less than certain other well-known brands.

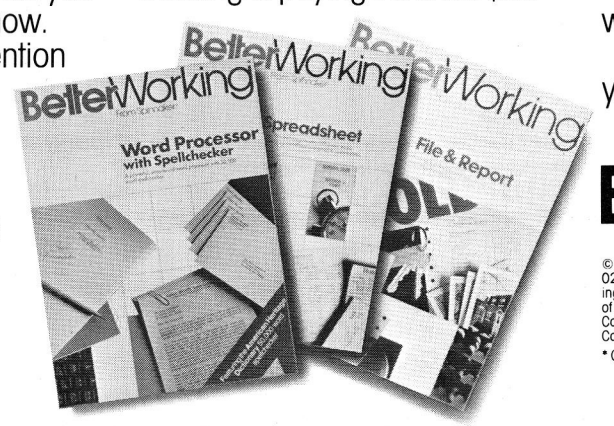
Now we'd be the first to admit that the chart above can't tell you everything you need to know.

So we'd also like to mention that neither of our high-priced rivals offers one-time printer customizing. And that you can't even buy a spellchecker to use with them (the American Heritage Spellchecker in our program finds 99% of all common mistakes). While only our most costly competitor matches our abilities to undo a delete command, lock and unlock files and provide 40/80 character on-screen capacity.

Finally, just in case you're thinking of paying the extra $65-$90 for an established name, we should point out that Better Working is a division of Spinnaker Software Corporation, one of the most respected companies in home software. And Better Working isn't limited to word processing—there's FILE & REPORT and SPREADSHEET, too.

All of this begins to explain why we call it "Better Working."

What it doesn't explain is why you'd want anything else.



BetterWorking™
From Spinnaker

© 1985 Spinnaker® Software Corp. One Kendall Square, Cambridge, MA 02139. All rights reserved. PFS is a registered trademark of Software Publishing Corporation. Apple is a registered trademark and Apple Writer is a product of Apple Computer, Inc. Better Working is a trademark of Spinnaker® Software Corp. Better Working Spelling Software developed by Houghton Mifflin Company, publishers of The American Heritage Dictionary.

* Comparison based on Apple® II Series versions.

Your assembly-language routine works by first going to location $06 (set up by the Applesoft program) to get the value to put into the accumulator, at which point it calls the PRBYTE routine. Because the PRBYTE routine is limited to printing only the accumulator, you are limited to converting values between one and 255. For numbers greater than 255, you can use the Applesoft program in **Listing 5** to call the PRBYTE routine twice.

Because the PRBYTE routine does not print a RETURN after the hex number, you can print the 2 bytes side by side to form the complete hex-number equivalent. Lines 40 and 60 determine the high- and low-order bytes of the number N. If you're unfamiliar with this concept, future issues of this column will discuss that idea, as well. In the next column, I'll introduce some of the other registers of the 6502, and show you some other routines that can come in very handy.

Choosing an Assembler

In the meantime, you should probably start seriously looking into an assembler to purchase, or a public-domain assembler from your local user group. You have probably already noticed that the mini-assembler does not provide a method to save the source code for a program, and that changing a program generally means retyping the entire program. As your programs become larger and more involved, the mini-assembler will become inadequate for the job.

An assembler is to assembly-language programming as a word processor is to writing. It does not actually create the end result for you, but it does make getting there a lot easier. Likewise, many of the desirable qualities of an assembler sound a lot like those of a good word processor. It should be able to easily edit one or more lines of text in the source listing (source listings, in fact, are often saved to disk as text files!) and have global search and replace functions, the ability to move or copy blocks of text within the listing, and most of the other features usually associated with word processors.

Other features to consider are compatibility with other assemblers, so that you can type in source listings from other magazines and reference books; number of directives (pseudo-ops) to make life easier; accessory utilities (some assemblers include other useful utilities); speed of assembly (most are acceptable—Apple's ED/ASM is notoriously slow); and which operating system (DOS 3.3 or ProDOS) you want to use (programs in this column will function equally well under ProDOS or DOS 3.3, although at some point I may explore ProDOS specifically). In future installments, I'll be using the Merlin assembler, but listings presented should be compatible with most major assemblers. Where differences occur, I'll provide conversion charts within the column for major assemblers.

If you have the October issue of this column, you may want to experiment with calling some of the routines listed there from your own machine-language programs as an exercise in using the built-in routine.■

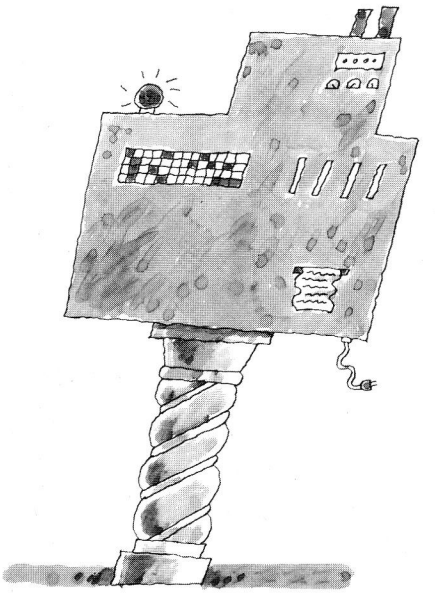
Listing 5. Hex conversion program that calls PRBYTE twice.

```
0 REM HEX CONVERT PROGRAM #2
5 PRINT CHR$(4);"BLOAD
  PRINT.HEX,A$300"
10 HOME
20 INPUT "DECIMAL NUMBER TO
   CONVERT:";N
25 IF N = 0 THEN END
30 IF N < 0 OR N > 65535 THEN 10
40 POKE 6,INT(N/256):REM STORE HIGH
   ORDER BYTE
50 CALL 768: REM PRINT HEX
   NUMBER
60 POKE 6,N - INT(N/256)*256: REM
   STORE LO ORDER BYTE
70 CALL 768: REM PRINT 2ND HALF OF
   NUMBER
60 PRINT: GOTO 20
```

DIAMOND™ BY
CONSISTENT SOFTWARE
Your Baseball/Softball
Statistics Tracking & Scoring System
Now you can consistently . . .
track player stats
★ players names, addresses
★ 28 offensive stats
★ 7 defensive stats
★ 26 pitching stats
manage team info
★ coaches names, addresses
★ schedules
★ equipment lists
★ car pool assignments
score a game
★ create lineups
★ assign positions
★ score play by play
★ automatically updates statistics
Best of all, it's easy to use . . . forms fill in . . . on-line help.
For Apple* IIc & IIe with 64K, 1 disk drive (printer optional)
Suggested Retail Price $69.95 each
Volume Discounts Available
Terms: U.S. Dollars. All orders shipped UPS ground. $3.00 for C.O.D. Air extra. California residents add 6% or 6½% sales tax. Cash or cashiers check only on C.O.D. Allow 10 days for personal check to clear.
Order now! Toll free 1-800-345-3353 Outside California
Specify 64K or 128K version when ordering.
CSI™ Consistent Software Incorporated
Send check or money order to:
1050 Duncan Avenue
Suite G, Department IC
Manhattan Beach, CA 90266
For details, call
(213) 374-2304
Prices and functions subject to change without notice.
*Apple is a registered trademark of Apple Computer, Inc.

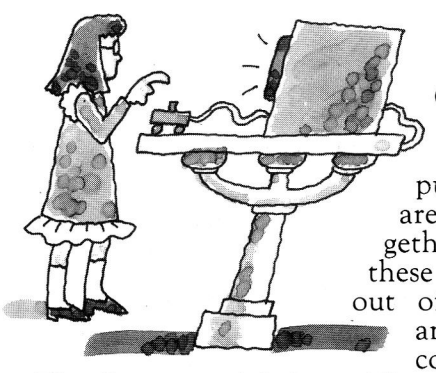
Roger Wagner is the author of Assembly Line: the Book *and is president of Roger Wagner Publishing, the publisher of Merlin and MerlinPro assemblers. Write to Roger at Roger Wagner Publishing, 10761 Woodside Avenue, Suite E, P.O. Box 582, Santee, CA 92071.*

WANTED: OLD THINKER TOYS.

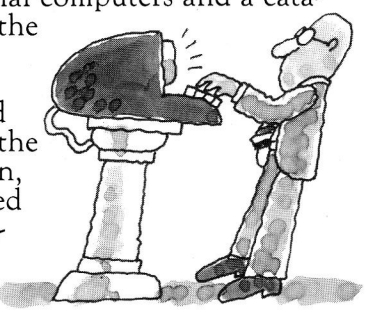


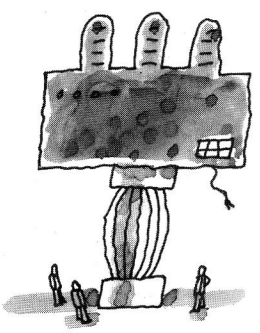
CW Communications, ComputerLand and The Computer Museum invite you to send in your early personal computers, software, and memorabilia — you could win a free trip to The Computer Museum in Boston

Your old, dusty "thinker toy" may now be ready to become a treasured museum piece. The Computer Museum in downtown Boston — an international museum dedicated entirely to computing — is searching for the very best and most unique relics of the personal computer revolution.



ComputerLand, CW Communications, and The Computer Museum are working together to bring these early relics out of your attic and into the collection of The Computer Museum. The museum is especially looking for kit machines, prototypes, programs, output, newsletters and memorabilia of early computing from around the world. A selection of the finest items will be used to create an exhibit on the evolution of personal computers and a catalog highlighting the Museum's collections. If your submission is accepted for addition to the Museum collection, you will be invited to the grand opening of the exhibit and will receive a bound edition of the catalog. If your item is selected as one of the five best "finds", you will also receive an all-expense-paid trip to Boston for the grand opening party.

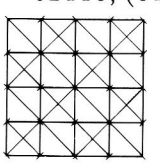




So, get up to the attic, down to the cellar and into your closets, and tell us what you find! Call or write the Museum for an official entry form, or send a photo and description of your items by March 1, 1986 to: The Computer Museum, Personal Computer Competition, 300 Congress St., Museum Wharf, Boston, Massachusetts USA 02110, (617) 426-2800, Telex: 62792318.

ComputerLand®

The Computer Museum



CW COMMUNICATIONS/INC.

Entries will be judged on significance, rarity, date, completness and condition. Items particularly sought include pre-1980 machines, early serial numbers (get those number 1's out), machines made for purchase outside of North America (even modern machines are sought in this category); first releases of software such as first releases of operating systems, languages and mass-marketed and original applications; and pre-1980 photographs, newsletters, manuals and other records. The Computer Museum is a private non-profit educational institution. All donations are tax-deductible according to the provisions of the Internal Revenue Service. Thinker Toys is a registered trademark of George Murrow & Murrow Designs, Inc.

REVIEWS

inCider's Ratings

★★★★	Excellent
★★★	Above average
★★	Good enough
★	Not up to standards
☆	The empty set

UniDisk

Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014

Floppy-disk drive
Any Apple II
$429 with controller
$329 drive only

★★	Ease of set-up
★★	Ease of use
★★	Documentation
★★	Support
★	Overall

Unlike Apple's other recent new product releases, the UniDisk seems to reflect the company's shuffling and reshaping. A cosmetic upgrade to the aging, box-styled Disk II, the UniDisk is a half-height drive in a three-quarter-height enclosure. It complements the existing DuoDisk in content and appearance—but it's still only 143K.

Inside the traditional Apple-colored plastic box, the drive is sheathed in aluminum. I can only imagine that this is a concession to the spurious FCC emissions code. While you could crack open the old Disk II in less than a minute for a quick speed adjustment, the UniDisk requires major disassembly (a small torch wouldn't hurt)—and it's still 143K.

Despite proven Apple performance (although third-party drives are usually less expensive) and the assumed reliability and speed of Apple repairs, it's difficult to recommend single-drive systems, which are usually aimed at the junior-level purchaser who has had little prior computer experience. The UniDisk drive, though, does have a built-in 19-pin D-type connector for that time when a second drive becomes necessary—even though it's 143K.

With everyone poised, breath bated, waiting to take a look at Apple's totally *new* drive, the UniDisk 3.5 (a 3½-inch maxi-storage mechanism—see "Apple Announces New Products That Dazzle, New Enhancements That Perform," November 1985, p. 12, for more information), the UniDisk seems to be a letdown. It is, until you talk to the folks at Apple and hear them say, quite pointedly, that the UniDisk is meant only to round out their product line. It's *not* a major new product release. I can only hope that this *real* new drive does live up to expectations. The Apple II could certainly use it—especially if it isn't 143K.■

Bill O'Brien
Fort Lee, NJ

Visible Pascal

Wiley Professional Software
605 Third Avenue
New York, NY 10158

Programming language
Any Apple II, 64K
(Apple II or II Plus requires language card)
$59.95

★★★★	Ease of set-up
★★★	Ease of use
★★★★	Documentation
★★★	Support
★★★★	Overall

Compared to most other Pascal systems, Visible Pascal provides a gentle introduction to this interesting programming language—kind of like learning Pascal from Mr. Rogers instead of a Marine drill sergeant. The advantage of Visible Pascal is that it's an interpretive system—not compiled, like most versions of the language (which make you type in your program, then instruct the Pascal compiler to convert the program to machine language). Visible Pascal executes program statements one line at a time and lets you view the output and corresponding program line simultaneously, although this method decreases speed significantly.

Visible Pascal also adds a few extras to standard Pascal, mostly graphics routines, which are cute, but not too useful. It's spiffy to see the lion chasing the

APPLEWORKS ENHANCEMENTS

Read why Applied Engineering
is the acknowledged leader in AppleWorks enhancements

- Applied Engineering was first to expand Appleworks beyond 55K.
- Applied Engineering was first to eliminate disk access on Drive 1 in Appleworks, thereby dramatically speeding up the program and reducing disk drive wear.
- Applied Engineering was first to expand AppleWorks to 1 megabyte of memory.
- Applied Engineering was first to expand AppleWorks to 3 megabytes.
- Applied Engineering was first to provide auto segmenting on large files so any size file can be saved on regular floppies.
- Applied Engineering was first to increase the maximum number of records in the data base from 1350 to 16,300.
- Applied Engineering was first to increase the number of lines in the AppleWorks word processor from 2250 to 16,300.
- Applied Engineering was first to display the time and date on the AppleWorks screen.
- Applied Engineering was first to provide auto dating as part of the data base field.
- Applied Engineering was first to provide auto time stamping as part of the data base field.
- Applied Engineering was first to include a built-in print spooler for AppleWorks. So you're back in AppleWorks in 10 seconds not 10 minutes.

With all of these firsts, it's no wonder most people choose Applied Engineering when they want enhancements to Appleworks. Especially when you consider that nearly all the "firsts" listed above are "onlys" too. And our Appleworks enhancements are as easy to use as inserting a disk and pressing return because all enhancements are merged with the AppleWorks program disk and stay there out of sight until needed, only now AppleWorks will run up to 20 times faster, and be easier to use at the same time.

And we're working on new improvements to AppleWorks all the time, so the few remaining criticisms the software reviewers gave AppleWorks will vanish forever. So if you want more out of AppleWorks, order RamWorks II™ and Timemaster H.O.™ for the IIe or Z-RAM™ and IIc System Clock™ for the IIc. You'll find specifications and prices for these products listed in this magazine. Please look for Applied Engineering in the advertiser's index.

There's no question about how they'll increase your productivity. The only question you'll have is how you ever got along without them.

214-241-6060

APPLIED ENGINEERING
"We Set the Standard"

little gnome, but after a few runs it has all the appeal of an overplayed song on AM radio.

Graphics Example

In Visible Pascal the spotlight's on graphics—a questionable emphasis. Certainly, well-executed graphics add more interest than the dry examples in Pascal text books. Visible Pascal produces high-quality graphics and includes powerful graphics functions. An interpretive system, though, is too slow to create any gee-whiz scenes. You can't use an interpreted language to conduct galactic warfare.

Beyond the advantages and disadvantages of its interpretive environment, Visible Pascal includes a few neat toys: One program plays music, another draws pictures (with paddles or a joystick), and another generates designs. All these programs are entertaining, but so is Pac-Man—which is about as helpful for learning Pascal.

These extra goodies let you play with a computer without getting into trouble. That's an important consideration for novices, but experienced users will find them rather mundane.

Limitations

To produce a pleasant learning environment, the creators of Visible Pascal had to do some heavy pruning in the undergrowth of the standard language; for instance, they eliminated pointers and records. These are some of the more powerful and useful features of Pascal, but beginners rarely encounter them—and won't miss them.

Unlike the standard edition of the language, Visible Pascal doesn't require semicolons. Although its authors contend that the semicolon is a beast that surprises and frustrates novice and experienced Pascal programmers alike, there is no justification for its removal. In an interpretive environment, it's easy to see errant semicolons and the trouble they cause. Also, once you graduate from Visible Pascal and work with the true language, the semicolon (now in cahoots with an equally merciless compiler) will destroy many programs. It seems best that newcomers know about the semicolon while learning the syntax of the language.

Should You Buy?

Easy-to-use software and documentation make Visible Pascal excellent for learning Pascal and structured programming. It's also fun. If you're a new programmer looking for a system that takes you by the hand (and sometimes the throat) through the Pascal jungle, buy it. But if you're an experienced programmer, you may want to put your 60 bucks toward a regular Pascal system. Either way, you must eventually acquire a real version of Pascal—one with a compiler—to program in the language.■

James McKelvey
London, England

Kyan Pascal

Kyan Software
Department H
1850 Union Street #183
San Francisco, CA 94123

Programming language
Any Apple II, 64K
$69.95

★★	Ease of set-up
★	Ease of use
★	Documentation
★★	Support
★	Overall

With increasing interest in Pascal, the once-ubiquitous Apple Pascal now finds itself pitted against several system contenders in the marketplace. Among them is Kyan Pascal, which generates actual machine language, so you can run a compiled version of your program, unlike Apple Pascal programs, without a system disk. Although the Kyan compiler is a bit faster than Apple Pascal's, Kyan isn't significantly speedier—it's a two-pass system, and its slowness is its biggest drawback.

In this two-pass method, the first pass translates the Pascal program into assembly language, and the second translates that version into machine language. Every time you compile a program, you must wait for both the compiler and the assembler to finish. The dubious advantage of such a system is that it lets you examine and modify the assembly language before its final translation. Theoretically, you can then write efficient assembly-language subroutines for your most important programs, but there are problems with this technique. Hacking through a Pascal program to save only a few milliseconds is like putting mag wheels and a turbocharger on a Rolls Royce—it's inappropriate and dangerous.

The biggest problems with Kyan Pascal become apparent after you've used it for a while. The product just isn't intelligently designed. You get the impression that three people were sitting around a bar one night and one of them said, "Hey, Moe, wanna build a Pascal compiler?" The compiler chokes and dies if you include a null statement (a statement that conveys no information). The editor is clumsy and poorly adapted to writing programs. There are no debugging tools and no overlaying facilities (a memory-saving necessity on small computers). There are precious-few predefined functions. Error messages are confusing, incomplete, sparse, and terse. Also, the compiler sometimes fails for no reason.

Documentation

The documentation is nothing to alert the Pulitzer Prize committee about. The manual is disappointing from the moment you open the book (and the errata sheets fall out) to the time you finally locate the in-

What every Apple II+ and IIe user should ask before buying the "Sider" 10 MB hard disk:

When a company offers a superior quality 10 megabyte Winchester hard disk for only $695, it's bound to raise a few eyebrows... and a lot of questions. The fact is, you're probably already wondering "Can I really get a 10 megabyte hard disk that's *reliable* for only $695?" The answer is: ABSOLUTELY...when you choose the Sider from First Class Peripherals.

What's so great about the Sider?

For starters, the Sider lets you boot your ***Apple II+*** or ***IIe*** directly off the hard disk—unlike some other Winchester subsystems. Rebooting is also trouble-free. And the disk is partitionable, allowing you to allocate space to four operating systems on the same disk. The Sider supports: Apple DOS 3.3; Pro DOS™; Apple Pascal; and CP/M®

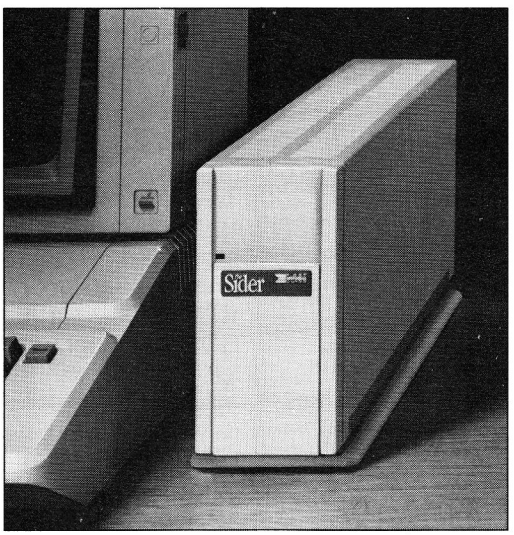
What's more, a small "footprint" lets you incorporate the compact Sider into your existing computer set-up with ease.

In addition, with the Sider, you not only pay far less for the subsystem, you also save money on installation. Because, unlike other 10 MB systems that require the purchase of expensive "extras," the Sider is *plug and play*. Everything you need is provided, including cables, host adaptor, installation software and manual.

What makes it so reliable?

To start, the Sider is manufactured, and sold exclusively, by First Class Peripherals, an innovative computer company which is backed by Xebec. The computer industry's leading manufacturer of disk controllers, Xebec has over a decade of experience serving customers like IBM, Toshiba, Texas Instruments and Hewlett Packard. It's this kind of expertise that helps assure the Sider's performance.

Special design features further enhance reliability. The Sider's controller is the field-proven, industry standard Xebec S1410A. And Xebec's 3200 drive tester, the toughest in the industry, ensures that the Sider will operate reliably. One more assurance of the $695 Sider's quality: it's UL Approved and FCC Class B rated.



"Only $695?"

$595 Oct. 1- Dec. 31, 1985

But why is it only $695?

You pay less for the Sider than for other 10 MB hard disks simply because you're paying for the superior quality components inside the unit, not for a lot of retail overhead costs. Since First Class Peripherals sells direct, you avoid dealer and distribution expenses, and pay only for the product.

What about a guarantee?

Like many experienced Apple users, you may be reluctant to buy a hard disk priced at only $695 without fi eing for yourself how it performs. T why First Class Peripherals offers you a reassuring, money-back guarantee that eliminates any risk on your part. Simply order the Sider and use it for 15 days. Then, if you're not entirely satisfied, return it and receive a full refund—no questions asked.

The Sider also comes with a full one-year limited warranty. Plus, there's a convenient, toll-free hotline you can call anytime you have a technical or service question, or need help.

Don't delay. Order the Sider now.

To receive the Sider 10 megabyte Winchester hard disk subsystem for only $695, simply order using the coupon below. For faster service, order by phone and charge to your VISA, MasterCard or American Express. (You can also call us if you have any questions or technical concerns about the Sider. We'll see you get the help you need.) Call toll-free:

1-800-538-1307

In Canada, call 1-800-227-7792
Extention 242

☐ Yes, please send me the Sider, including half-height 10 megabyte Winchester hard disk drive, Apple adaptor board, cable, complete installation software and documentation.

I prefer to pay as follows:

☐ I've enclosed my check or money order for $695* + $15 shipping and handling, payable to First Class Peripherals.

☐ Please bill the following credit card account for $695* + $15 shipping and handling:

☐ VISA ☐ MasterCard ☐ American Express

Card # *Exp. Date*

Signature

Name

Address

City

State *Zip*

Telephone (area code)

Mail to:

FIRST PERIPHERALS CLASS

3579 Highway 50 East
Carson City, NV 89701

242

* Residents of CA, NV and PA, please add appropriate sales tax.

Apple and Pro DOS are trademarks of Apple Computer, Inc.
CP/M is a registered trademark of Digital Research, Inc.

Circle 132 on Reader Service Card.

formation—which is often garbled by typographical errors. The manual provides a fairly good introduction to the workings of the system, but that's it. As an introduction to Pascal, the text is incomplete and too complicated for the novice. As a reference manual, it's inconvenient: The lack of a comprehensive index—or even any logical progression of chapters—is infuriating.

Quite frankly, the system isn't worth Kyan's $70 asking price. For a system claiming to be "lightning-fast and loaded with features," it's at best moderately quick and very sparse. Kyan Pascal is the beginning of a good system, but it needs major revisions before it can compete with the more professional implementations of the language on the market.■

James McKelvey
London, England

Editor's note: Thomas Eckman of Kyan Software responds that Kyan Pascal is a "one-pass compiler coupled with a two-pass assembler. While it may compile *a little more slowly, Kyan Pascal gives programmers the capability of building libraries of linkable assembly-language routines and 6502 machine code that* run *much faster than other Pascal implementations. The editor is modeled after WordStar and is only as clumsy as that popular product. And, using the Chain function, programmers can overlay programs and pass parameters between them." He challenges skeptics to take advantage of Kyan's money-back guarantee, and suggests they read Tom Swan's Pascal Primer in the October 1985* inCider *(p. 52) for a second opinion.*

V-Color Graphics Tool Kit 1.0

Video-7
550 Sycamore Drive
Milpitas, CA 95035

Graphics utilities
Apple //c, or //e with 128K
$49.95

★★★★ Ease of set-up
★★★★ Ease of use
★★ Documentation
★★ Support
★★★★ Overall

Just as a well-stocked tool kit makes a mechanic's life easier, the V-Color Graphics Tool Kit 1.0 makes double-hi-res work less odious—and somewhat more enjoyable—for a programmer, thanks to a series of ampersand-prefaced commands. The tool kit is a collection of Applesoft routines combined with a special graphics driver. Some sour notes spoil this otherwise-fun package: If you don't have an Apple //c, you need a //e with 128K of memory.

The software routines are supplied on a double-sided disk—DOS on one side, ProDOS on the other. After loading the hi-res driver, you can set any of six graphics modes (but only five are currently implemented). Commands & GR 1 through & GR 6 establish monochrome double hi-res with 560-by-192-dot resolution; 16-color double hi-res in 140-by-192; a combination of modes 1 and 2 on the screen; mode 4, the hold-out; black-and-white hi-res at 280-by-192; and a medium-res, 16-color mode with 80-by-48 resolution. The 16 colors range from black to white with no duplications among the magentas, blues, yellows, greens, and intermediate tints.

The Picasso in You

The tool kit lets you move the graphics cursor to draw lines, fill areas, and add text to the screen. And if you're not happy with Apple's character set, V-Color includes a character editor—but it's for ProDOS users only. When you're done, a resequencer lets you "replay" everything you've drawn.

Actually, the sequencing feature is part of Key.Draw, an Applesoft program that combines the tool kit's graphics utilities into a usable, viewable form. Its companion, Mouse.Draw, a mouse-driven version of the same program, is also written in Applesoft. Neither is a professional implementation of V-Color's graphics resources, and Video-7 doesn't pretend they are. Rather, Video-7 suggests using the two programs as examples of how to program with the graphics extensions they illustrate.

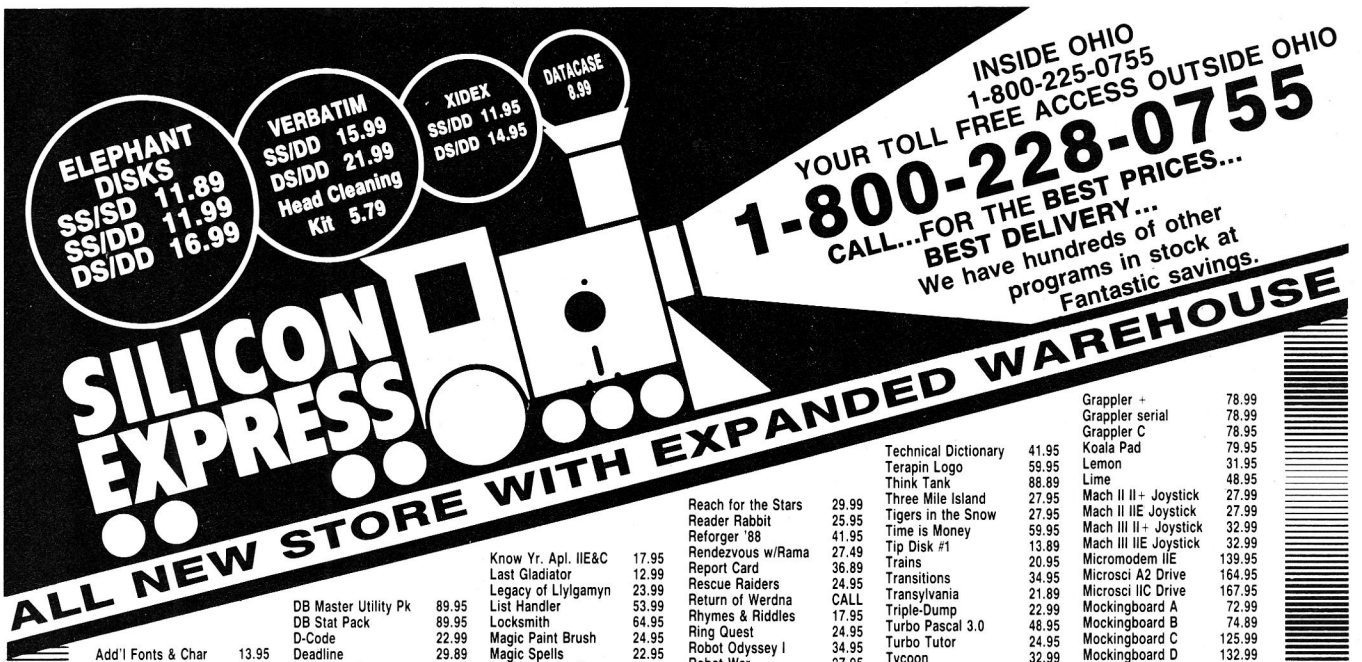
The Shape of Things to Come

If you've ever tried to use shape tables, you've experienced the nadir of Apple work. You'll be relieved to find a shape generator on the tool-kit disk. The generator makes composing shape tables as easy as using the open-apple and arrow keys.

Beware, though: The hi-res driver loads partially into the extended-memory area and partially into the Apple's normal memory. Video-7 recommends that you upgrade the tool kit with its V-Color Apple //e RGB interface (80-column output, RGB and extended memory), which is the equivalent of Apple's Extended 80-Column Color Card. I did notice the usual increase in color depth with an RGB card and monitor, but the tool-kit routines produced such superb output with just the Apple's standard composite video into a corresponding color monitor that you might consider RGB overkill.

In either case, your Apple //e must be capable of double hi-res (REV.B or higher motherboard). If you're assured of that, most RGB interfaces using AUX CON will automatically place the computer in double hi-res. If you're using Apple's 80-column extended memory card, just add the enclosed jumper at J1 on the card.

Since the V-Color commands require the ampersand prefix, if you run any other programming add-ons that use the same lead-in character while V-Col-



Add'l Fonts & Char	13.95	DB Master Utility Pk	89.95	Know Yr. Apl. IIE&C	17.95	Reach for the Stars	29.99	Technical Dictionary	41.95
Addition Magician	22.95	DB Stat Pack	89.95	Last Gladiator	12.99	Reader Rabbit	25.95	Terapin Logo	59.95
Adventure Const.	32.95	D-Code	22.99	Legacy of Llylgamyn	23.99	Reforger '88	41.95	Think Tank	88.89
Algebra I thru IV	ea. 26.95	Deadline	29.89	List Handler	53.99	Rendezvous w/Rama	27.49	Three Mile Island	27.95
Algebra V & VI	34.95	Delta Drawing	27.95	Locksmith	64.95	Report Card	36.89	Tigers in the Snow	27.95
Alphabet Zoo	18.95	Disk Arranger	20.95	Magic Paint Brush	24.95	Rescue Raiders	24.95	Time is Money	59.95
Alpha Plot	24.89	DiskQuick	16.99	Magic Spells	22.95	Return of Werdna	CALL	Tip Disk #1	13.89
Amazon	27.49	Disk Repair Kit	20.95	Magic Window II	93.89	Rhymes & Riddles	17.95	Trains	20.95
Apple Mechanic	16.99	Disk Repair Kit	58.99	Magic Window IIE	93.89	Ring Quest	24.95	Transitions	34.95
Archon	23.99	Dollars & Sense IIC	69.89	Make a Match	20.95	Robot Odyssey I	34.95	Transylvania	21.89
Archon II	24.49	Dragonworld	27.49	Map Pack	13.95	Robot War	27.95	Triple-Dump	22.99
ASC II Pro	77.99	Eagles	27.95	Mask Parade	27.95	Rocky's Boots	31.95	Turbo Pascal 3.0	48.95
Assembly Lines	16.95	Early Games	19.95	Mastering the GRE	69.95	Run For the It	23.99	Turbo Tutor	24.95
Axis Assassin	14.89	Enchanter	23.99	Mastering the SAT	69.95	Sargon III	30.99	Tycoon	32.99
Back-it-up III	49.95	Epidemic	22.89	Master Type	24.89	Sat (Harcort Brace)	46.99	Typefaces	10.99
Bag of Tricks	24.99	Essential Data Dup	44.99	Math Blaster	29.89	Seastalker	23.95	Typing Tutor III	30.89
Baltic '85	24.95	Expedition Amazon	21.89	Math Maze	27.95	Sensible Speller	69.95	Ultima II	41.95
Bank Street Filer	40.99	Extra K	22.99	Merlin	35.99	7 Cities of Gold	25.49	Ultima III	34.99
Bank Street Mailer	40.99	Facemaker	17.95	Merlin Pro	59.95	Shadowkeep	27.49	Understanding IIE	17.95
Bank Street Writer	40.99	Farenheit 451	27.49	Merlin Combo	64.95	Sideways	34.99	Understanding II+	15.95
Bank Street Speller	40.99	Fat Cat	19.99	Micro Cookbook	22.99	Silicon Salad	13.99	Universal file conv	24.95
Baron	32.89	Fat City	23.99	Mickey's Space Adv.	27.95	Skyfox	25.49	Utility City	16.99
Battle for Normandy	25.89	50 Mission Crush	25.89	Micro Lg. Baseball	27.95	Snooper Trp I or 2	22.95	Versaform	54.99
Battle of Shiloh	27.95	Fighter Command	41.95	Micro Speed Reading	83.95	Solo Flight	24.95	Video Toolbox	23.95
Beach Landing	23.99	Financial Cookbook	33.99	Millionaire	32.89	Songwriter	23.89	Visable 6502	31.89
Beagle Bag	18.49	Flashcalc	69.95	Miner 2049er	25.95	Sorcerer	26.99	War in Russia	51.89
Beagle Basis	19.99	Flex Type	16.99	Mortgage Analyzer	59.95	Speed Reader II	40.99	Wilderness	38.95
Beagle Graphics	32.99	Flight Sim. II	33.89	MouseWrite	86.95	Spellagraph	27.95	Will Writer	31.95
Beneath Apple DOS	13.95	Fontrix	56.89	Most Amazing Thing	22.95	Spell Akazam	27.95	Winnie the Pooh	27.95
Bnth. Apl. Pro DOS	13.95	Fntpaks 1 thru 13	ea. 14.99	Multi Disk Catalog	17.95	Spellicopter	23.99	Wishbringer	27.95
Beyond Cast. Wolf.	24.89	Forecast	41.95	Multiplan DOS 3.3	65.95	Spell It	34.95	Witness	23.95
Black's Law Dict.	69.95	Format II	91.89	Munch-A-Bug	23.95	Spitfire Simulator	24.95	Wizardry	29.99
Blazing paddles	34.95	Fortress	22.89	Murder by the Dozen	21.99	Spy Hunter	31.95	Wizard's Toolbox	23.95
Bomb Alley	41.95	Fraction Factory	18.99	Murder on the Zind.	23.99	Spy vs. Spy	24.95	Wiztype	24.95
Bookends	71.99	Fraction Fever	17.95	Music Construction	24.99	Squire	34.95	Wizmath	24.95
Bookends Extended	104.95	Frame-Up	16.99	Napoleon's Campaign	41.95	Standing Stones	12.99	Wizprint	15.99
Breakthru Ardennes	41.95	Gato	23.95	NATO Commander	24.95	Starcross	29.95	Word Attack	29.89
Broadsides	27.95	Gemstone Warrior	24.95	Net Worth	48.89	Stellar 7	23.89	Word Handler	55.95
Bruce Lee	24.95	General Manager II	144.95	Newsroom	34.95	Sticky Bear ABC	23.99	Word Spinner	23.95
Bumble Games	24.95	Geopolitique 1990	25.89	North Atlantic 86	38.89	Basket Bounce	23.99	Wordstar	229.95
Bumble Plot	24.95	Germany 1985	38.89	Objective Kursk	25.89	BOP	23.99	Write Choice	26.95
Carmen Sandiego	23.99	Gertrude's Puzzles	27.95	Old Ironsides	23.99	Math	23.99	Xyphus	21.89
Carrier Force	41.95	Gertrude's Secrets	27.95	One-On-One	25.49	Numbers	23.99	Zaxxon	24.89
Carriers at War	31.99	Goren Bridge	51.95	Operation Market Gar.	34.95	Opposites	23.99	Zork I	23.95
Captain Goodnight	24.95	Grandma's House	17.95	Paper Graphics	30.89	Reading	23.99	Zork II or III	26.95
Cartels & Cutthroats	27.95	Graphics Department	82.95	Pattern Maker	26.95	Shapes	23.99	Z-Term	104.95
Castle Wolfenstien	19.99	Graphics Magician	36.89	Pensate	20.95	Story Machine	17.95		
Cat Graphics	20.95	Graphworks	63.95	PFS: Access	41.95	Story Maker	24.95	HARDWARE	
Chshp. Load Runner	23.95	GPLE	28.99	PFS: Write	71.49	Summer Games	27.95	80 Col. 64K Card	69.95
Chess	48.95	Guadalcanal	41.95	PFS: File	71.49	Summer Games II	27.95	Alphabits	84.95
Chart 'n Graph Tlbx.	23.95	Hard Hat Mack	12.99	PFS: Plan	71.49	SuperCalc 3A	134.95	Apple Cat II	192.99
Chivalry	32.99	Hey Diddle Diddle	17.99	PFS: Report	71.49	Super Disk Copy	24.95	Compuserve Starter	22.99
Chop Lifter	22.89	Hitchhiker's Guide	22.99	PFS: Graph	71.49	Suspect	26.89	Cricket	119.95
Clip Art	19.99	Home Accountant	47.95	PFS: Best Sellers	149.99	Sword of Kadash	24.95	Datacase	8.99
Complete Graphics	47.89	Home Cataloger	34.95	PFS: Solutions	ea. 14.95	Take 1	38.89	Disk Notcher	8.95
Computer Ambush	41.95	Homeword	46.95	Phantasie	27.95			Echo +	104.95
Computer Baseball	25.89	Homeword Filer	46.95	Piece of Cake Math	21.95			Flip-n-File	14.95
Computer Bismark	41.95	Homeword Speller	32.95	Pie Writer	98.95			Grappler Buffered	144.99
Computer Qrtrbck.	27.95	Image Printer II	34.95	Picture Builder	23.99			Grappler +	78.99
Copy II+	19.99	Infidel	26.99	Pinball Construction	23.99			Grappler serial	78.99
Coveted Mirror	20.89	I.O. Silver	16.99	Pixit	31.89			Grappler C	78.95
Creature Creator	27.95	Jane w/mouse	199.95	Planetfall	23.99			Koala Pad	79.95
Crossword Magic	30.89	Juggle's Rainbow	18.95	Practicalc II	48.95			Lemon	31.95
Crypt of Medea	21.95	Kamfgrupe	41.95	Printographer	28.99			Lime	48.95
Cut & Paste	23.95	Karateka	21.99	Print Shop	27.99			Mach II II+ Joystick	27.99
Cutthroats	23.99	Kids on Keys	17.95	Pr. Shp. Gr. #1,2 or 3	14.99			Mach II IIE Joystick	27.99
Datalife Analyzer	21.95	Kid Writer	18.89	Print Shp. Companion	27.95			Mach III II+ Joystick	32.99
Dazzle Draw	36.99	Kinder Comp	17.95	Print Shop Refill	13.95			Mach III IIE Joystick	32.99
DB Master 3	159.95	Knight of Diamonds	20.99	Probyter	19.99			Micromodem IIE	139.95
DB Master 4	204.95	Knights of the Desert	27.95	Prof. tour golf	25.89			Microsci A2 Drive	164.95
		King's Quest	34.95	Pronto DOS	16.99			Microsci IIC Drive	167.95
				P-Term	90.95			Mockingboard A	72.99
				Puzzle Master	24.95			Mockingboard B	74.89
				Quest	21.89			Mockingboard C	125.99
				Questron	21.89			Mockingboard D	132.99
				RDF	24.95			Multiram CX (16 bit)	124.95
								Multiram 2X (16 bit)	CALL
								Multiram IIC 256k	319.95
								Multiram IIE 80/64K	129.95
								Multiram IIE 80/256K	169.54
								Multiview II+ 80/160	218.95
								Muppet Pad	43.99
								Orange Interface	49.95
								PaC IIC Interface	54.95
								Paddlesticks	33.99
								Peach	41.95
								Prometheus 1200A	288.99
								Prometheus 1200	298.99
								PSIO Card	169.99
								Super Fan	49.95
								System Saver Fan	61.99
								Ultraterm	244.89
								Videoterm	177.95
								Wildcard 2	79.95
								ZEE 80A Checkmate	69.95
								Zoom IIE	129.95
								PRINTERS	
								Star SG-10	228.99
								Star SG-15	394.99
								Star SD-10	344.99
								Star SD-15	474.99
								Star SR-10	494.99
								Star SR-15	594.99
								Star Powertype	344.95
								Okidata 192P	399.95
								Okidata 193P	559.95
								Daisywriter 2000	884.95
								Juki 6100	424.95
								Colored Printer Rbns	CALL
								Color Paper Pack	13.95
								MONITORS	
								Amdek Color 300	229.99
								Amdek Color 500	339.99
								Amdek Color 600	414.99
								Amdek Video 300G	127.99
								Amdek Video 300A	137.99
								Amdek DMV III	129.99

SILICON EXPRESS

5955 E. Main St. Columbus, Ohio 43213

1-614-868-6868

YOUR ORDER FORM
SILICON EXPRESS

5955 E. Main Street Columbus, Ohio 43213

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CHARGE CARD # _____ Exp. Date _____

QTY.	DESCRIPTION	PRICE

Computer Type _____ SHIPPING

Phone No. _____ TOTAL

No additional surcharge on Mastercard, Visa, or School purchase orders. Personal checks allow 2 weeks. Shipping charges are $2.50 minimum. Ohio residents add 5½% state sales tax. Prices subject to change without notice.

or's hi-res driver is loaded can produce odd results.

Although the tool-kit manual is accurate (though it tends to slaughter the English language in spots), Video-7 seems to have designed the documentation for a younger audience. My nearly middle-aged eyes almost needed their own video enhancer to read the tiny type size.

Although this isn't some ultra-powerful, incredibly chic graphics package, if you're trying double hi-res, the V-Color Tool Kit is a good value at $49.95. If you're trying to design better graphics routines, the kit is an even better bargain: For the paltry sum of $20, Video-7 will send you the source code for its double-hi-res drivers in both DOS and ProDOS formats. ■

Bill O'Brien
Fort Lee, NJ

Remember!

DesignWare
185 Berry Street
San Francisco, CA 94107

Memory training
Any Apple II, 64K
$79.95

★★	Ease of set-up
★	Ease of use
★	Documentation
★★	Support
★	Overall

Imagine a publisher claiming that its memory-training software "is so powerful it's worth buying a home computer just to use the program." Whether you're a veteran or a recent convert, Remember!'s packaging is sure to send a thrill of excitement down your spine—especially if you need a little help in the memory department. Remember! does not live up to its promise, though. The program's not dead in the water—it won't crash on you—and it does offer some "cute" features. Unfortunately, the developers, programmers, and marketing people have overlooked some of the fundamentals.

Remember! is a low-level filing system married to a run-of-the-mill test generator. You design 20 question-and-answer lessons around facts you need to learn, then save the lessons on data disks, which you initialize from within the program. You can put several lessons on one disk or keep a separate disk for each subject on which you're working. You can then study the material via electronic flashcards or by quizzing yourself. The program can present questions in sequential or random order, with a choice of question-to-answer, answer-to-question, list, or multiple-choice format.

One of Remember!'s unique (though overrated) features is its Hints option. Once you set up your lesson, you can add visual, auditory, or written hints

to help you learn. The visual aids are crude line drawings you construct with selected keys or a joystick. The audio hints are little tunes (a maximum of 20 notes within one octave or so) you compose to jog your memory. These reminders may be little more than distracting time bandits—and if you're in school, your teacher won't like it if you hum during a test. Written prompts may be up to 34 characters long. You may not mix hints in any given lesson, even though a melody may work best for remembering one fact and a picture for another.

Remember! can also show foreign-language accent marks and subscripts (handy for chemistry) on screen. (When you set up a lesson, you choose the language in which you want to work—English, German, Spanish, Italian, or French.) You must access subscripts and accents through the number row on your Apple. If you try to use these keys as ordinary numbers, though, you'll find you can't.

Being able to see these additional characters on screen is a welcome feature. But when you print lessons to take with you for later study, the hard copy will not include the accents or subscripts—even if your printer can generate them. Seeing "H2O" probably won't hamper your efforts at learning chemistry, but seeing "le frere" in print will definitely slow your attempts to master the intricacies of a language.

Remember! has other design problems, as well. For example, you must type your answers exactly as you entered them originally—that means typing zinc for Zinc will produce a beep, and the program will deduct a point from your score.

As for documentation, the "Learning How You Learn" section in the user's guide is a somewhat pedantic outline of historical and contemporary methods of memorizing facts. My impression of this insert

Do you exhibit a tendency to make punctuation errors? Regardless of your skills, typographical errors occur. Therefore Sensible Grammar

SENSIBLE GRAMMAR™

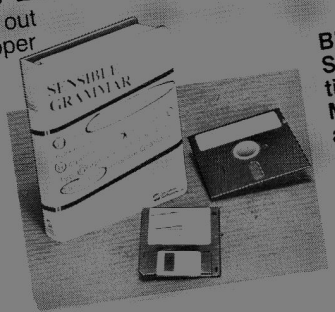
Yes, just like your old English teacher, your Apple Computer can now check your papers for grammatical and many other writing errors. Don't be embarrassed or lose credibility because of simple typos and mistakes. And it's so easy and fast to do with **Sensible Grammar.**

SENSIBLE GRAMMAR

checks your grammar, capitalization, punctuation and abbreviations. It searches out phrases that are inconcise, vague, wordy or repetitive, as well as faulty, informal, pompous or sexist. It calls your attention to cliches and slang. It even allows you to enter your own personal trite and pet expressions and then lets you know every time you use them.

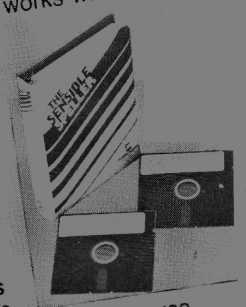
It Never Overrides Your Judgment

Sensible Grammar singles out possible mistakes or improper usage and then suggests a correct replacement word or phrase, but it always leaves you the option to accept or reject the suggestion.



A Perfect Complement

SENSIBLE SPELLER™ catches your spelling mistakes, utilizing its huge 80,000 word vocabulary derived from the official Random House Dictionary®. Like **Sensible Grammar**, it works with tireless efficiency. It displays misspelled words in context, suggests the correct spelling and allows immediate replacement of misspelled words with correct ones.



Black's Law Dictionary,™ **Sensible Technical Dictionary**™ and **Stedman's Medical Dictionary.**™ are also available separately on diskette for use with the Sensible Speller.

AppleWorks Compatible!

*Sensible Grammar and Speller ProDOS work with the following word processors, AppleWorks, Apple-Writer-ProDOS version (Apple Computer, Inc.); Format II Enhanced-ProDOS (Kensington Microware), and others. **Sensible Speller IV** works with DOS 3.2 and DOS 3.3-AppleWriter (Apple Computers, Inc.); Bank Street Writer (Brodebund); Format II (Kensington Microware); HomeWord & Screen Writer (Sierra On-Line Inc.); †PFS: WRITE (Software Publishing, Inc.); †Word Handler (Silicon Valley Systems); †CP/M-Wordstar (Digital Research Corp.-Micropro International); and others. Owners of trademarks indicated in parentheses: Black's Law Dictionary (West Publishing, Inc.); Stedman's Medical Dictionary (Waverly Press, Inc.)

†Note: CP/M, Pascal, PFS: WRITE and Word Handler versions do not suggest correct spelling of words or allow immediate correction of misspellings.

Sensible Grammar™ is available for $99.45; **Sensible Speller**™ for $125.00 in either the "IV" or ProDOS version; **Sensible Technical Dictionary**™ for $59.95; **Stedman's Medical Dictionary**™ for $99.95; and **Black's Law Dictionary**™ for $99.95. The three specialized dictionaries require the **Sensible Speller.** All programs are available separately and can run on Apple® computers.

Sensible Software,® Inc.

210 S. Woodward, Suite 229, Birmingham, MI 48011 • (313) 258-5566

Circle 84 on Reader Service Card.

is that its only function is to boost the publisher's claims about this "revolutionary learning program"—and that a majority of the program's users will probably just gloss it over.

My wish-list for Remember! includes an option for typing in alternate answers to questions. In some lessons, such as learning the state capitals, there can be only one correct answer. But it's unfair—even educationally wrong—to penalize a student if memory tells him or her that HCl is hydrochloric acid (an acceptable alternative), when the only answer the program "knows" is hydrogen chloride. Without more flexibility, I cannot agree that Remember! "teaches you how to learn." Instead, it teaches you to think like a machine.

The program's speed didn't impress me, either. Written in MicroMotion FORTH-79, Remember! is supposed to be fast. Its response time was sluggish, though, and some delays made me wonder if the program had gone to recess.

On the positive side, Remember! is easy to learn and use. The text style on the monitor is pleasant, and the "pointing finger" cursor is a nice change from the boxes you usually chase around the screen.

Remember! might encourage you to organize information you need to learn, yet I have many reservations. In my judgment, the program is not suitable for "an infinitely wide range of subjects," as DesignWare claims.

Finally, I wonder if an already motivated student needs an $80 electronic flashcard set to help him or her master a subject—and if an unmotivated or slow learner can really benefit from a software package that only rates a grade of D.■

Cynthia E. Field
Wakefield, RI

Sally Bowman at DesignWare responds, "Remember! does help students improve their ability to remember, but it is not a memory-training program. It is a tool to help students organize and study the vast amounts of information they are all required to memorize—new terms, new definitions, dates, people, places, events, etc. Before students are able to move on to problem solving and understanding, they must memorize the terminology. Remember! allows them to do so easily.

"The hint editors were not intended to be complex—they help jog your memory, not belabor the drawing process. Many students, during the field testing, found that the process of developing a hint made them remember the new information.

"The reviewer does not like programs that help students memorize ('teaches you to think like a machine'). Students still have to memorize vast amounts of information."

Peterson's Financial Aid Service and **Peterson's College Selection Service** for *Selective Guide to Colleges*

Peterson's Guides
P.O. Box 2123
Princeton, NJ 08540

College selection and financing
Any Apple II, 48K
$195, Financial Aid Service
$79.95, College Selection Service

★★★★ Ease of set-up
★★★★ Ease of use
★★★★ Documentation
★★ Support
★★★★ Overall

Parents and high-school counselors will appreciate these two software/reference-guide packages which help students find their way through the ins and outs of college selection and financing. Both perform their job well and contain elements of interaction and fun that written materials alone can't provide. The two packages are complementary, but separate; you can use one without the other.

The Selection Service

The College Selection package consists of two copyable disks and two books: the *Selective Guide to Colleges* including vital statistics for 275 colleges; and the *Counselor/Student Manual*, which provides helpful detail in using the software and guide.

The program is logical and easy to use. It leads you step-by-step through 18 selection criteria, including an extensive list of majors, costs, admission requirements, and special programs. The goal is to eliminate colleges and end up with a reasonable number to evaluate using the additional information in the guide.

For each criterion, pick one or more choices listed on screen. At each step, the program shows the number of schools remaining in your pool. If your choice reduces the pool too much or not enough, you can back up, change your answer, and see the new result.

Whenever you have 40 or fewer choices, you can list them, along with their page numbers in the guide. You can also get a complete summary of the selections leading to those choices, so you can review your choices and change any you like.

The Financial Aid Service

The Financial Aid Service contains three disks (two are double-sided) you can back up; the *College Money Handbook*, which is described as "the complete guide to expenses, scholarships, loans, jobs, and special aid programs at four-year colleges"; and the *Counselor/Student Manual*, which explains the use of the software and handbook.

The package provides a good starting point to explore financing college, but success probably depends more on a good counselor than on the package itself, as finance is rather complex.

The package covers five topics: estimating family contribution; calculating costs and estimating need; average costs by type of college; federal- and state-aid programs; financial aid from private sources.

The information you provide lays a factual base for exploring financial aid opportunities. A printed report lists aid programs that match your interests.

Most of the manual is filled with descriptions of state-aid programs and includes addresses for requesting further information. The handbook, on the other hand, includes college-cost and aid profiles that list expenses, summarize various kinds of financial aid, list money-saving options, and give information about applying for aid. Together, the program, manual, and handbook form a helpful package.

Conclusion

The College Selection software is thorough. Virtually everything you need is displayed on screen or is accessible with only a few keystrokes.

The Financial Aid Service program is not as interactive as the College Selection program. It lacks the give and take, the sense of adventure and speculation that make the selection program especially fun. But neither is it grim—Financial Aid Service makes the best of a pragmatic and mundane subject.■

Jon Voskuil
Milford, NH

Standard & Poor's Stockpak II

CBS Software
One Fawcett Place
Greenwich, CT 06836

Home and business investment software
Any Apple II, 48K

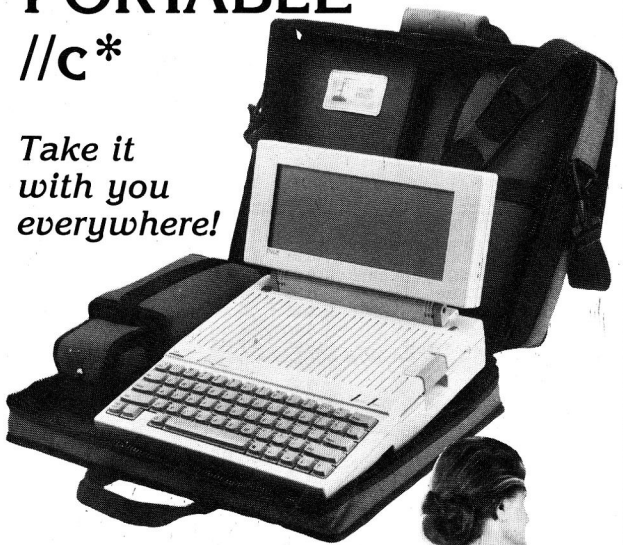
$150, includes a six-month subscription to Standard & Poor's composite stock update
$245 each for a further one-year composite subscription, a New York Stock Exchange subscription, or an American Stock Exchange subscription
$490 for an Over-The-Counter subscription

★★★ Ease of set-up
★★★★ Ease of use
★★★ Documentation
★★★★ Support
★★★ Overall

If you're a more-than-casual stock-market investor, Stockpak II can help you "pick your poison." This software is one of the best repositories of sound investment information you are likely to find. It neither recommends nor deep-sixes any particular stock. Instead, Stockpak II provides the information you need to

FIRST TOTALLY PORTABLE //c*

Take it with you everywhere!



System Features:

- 24 Line by 80 Character LCD Display
- 8 Hour rechargeable power supply
- 20 lb. total system weight including your //c
- Durable cordura carrying case with handle and shoulder strap

C-VUE Flat Panel Display $475.00
PRAIRIE POWER battery & case 190.00

TOTAL if purchased separately $665.00
if purchased together SAVE 70.00

PORTABLE SYSTEM PRICE
TOTAL $595.00

For more details and ordering information call 1-800-GET-CVUE (outside California) or (619) 274-1253 (inside California). MasterCard and VISA accepted. Prices subject to change without notice.

ROGER COATS
P.O. Box 171466
San Diego, CA 92117

*Apple //c not included
Apple //c is a registered trade mark of Apple Computer Inc.

AVOID THE CROWDS AND THE LAST MINUTE RUSH AND PLACE YOUR ORDER

CHRISTMAS IS JUST AROUND THE CORNER!

NOW!!

FREE SOFTWARE—For A Limited Time Only!!!!

Yes, that's right. We will give you a "KNOW YOUR APPLE" program absolutely free with any size purchase. This offer is good until quantities run out, so order now and get your free software program today. . . . . .

Disks 5¼"	List	Sale
Sentinel DS/DD COLOR 10/box	39.95	19.95 ☐
Ultra Magnetics BONUS Pack DS/DD 12/box	39.95	22.90 ☐
CDC SS/DD 10/box	31.95	9.95 ☐
CDC DS/DD 10/box	39.95	10.95 ☐
Data Matrix 10/box	44.91	11.95 ☐
Dysan DS/DD 10/box	49.95	33.95 ☐

	List	Sale
Datarack Head Cleaning Kit	15.95	12.95 ☐
Head Cleaning Kit (c2017)	16.99	7.95 ☐
Datamatrix Head Cleaner	6.99	4.95 ☐
Anti-Static Spray Texwipe	5.95	4.95 ☐
Checkmate Anti Static	3.88	2.95 ☐
Disk Pac 3½" Blue and Black	14.95	7.95 ☐
Disk Pac 5¼" Blue and Black	13.95	6.99 ☐
Disk File (6)	2.95	.99 ☐
Teak Rolltop Disk Storage (5¼" holds 50)	32.95	18.95 ☐
Teak Rolltop Disk Storage (3.5 holds 45)	23.95	14.95 ☐
Data Defender 70 (5¼" holds 70)	26.95	14.95 ☐
Data Defender 15 (5¼" holds 15)	4.49	2.99 ☐
Flip n' File 50 (5¼" holds 50)	19.95	9.99 ☐
Cassette Storage (6) Black and Blue	4.99	.99 ☐

We know of no better disks at any price.

DOLLAR DISKS!!!

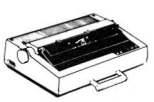
- Quality Sentinel brand 5¼" disks
- Reliable, lifetime warranty

- SS/DD only $1.00 each
- DS/DD only $1.15 each
- Any quantity

Brother HR-10 Daisy Wheel Printer

FINALLY! A Letter Quality Printer at a PRICE you can AFFORD. . . . . .

List price 349.00 **YOUR LOW PRICE ONLY $299.00***



The HR-10 is designed to keep pace with modern computing needs by producing sharp, beautiful letter quality text. Thanks to a 2k bytes buffer and bidirectional printing, HR-10 gets everything onto the page quickly and acurately. The sprocket wheel feeder TF-10, which keeps fanfold paper flowing smoothly and efficiently, is standard equipment. And a shadow print feature lets you highlight words or phrases so they stand out from the rest of the text. Other features such as superscript and subscript, auto-underline and carriage skip movement provide versatility usually found on more expensive models.

	List	OUR LOW PRICE*
Brother HR-15 Letter Quality	599.00	349.00 ☐
Olympia-RO Letter Quality	429.00	289.95 ☐
Epson Homewriter Dot Matrix	269.00	219.95 ☐
Epson LX-80 NLQ Dot Matrix-NLQ	299.00	249.95 ☐
Epson FX100 Dot Matrix	849.00	549.95 ☐

Monitors

	List	Sale
Sanyo DMC 5500 Color Composite	359.00	229.95 ☐
Sanyo DM2112 Green	118.00	79.95 ☐
Sanyo DM2212 Amber	118.00	79.95 ☐

Software

SUCH A DEAL BARGAINS

All Titles only **$9.99**

Adventureland	Electronic Breadboard
Apple Clinic	Mortons Fork
World Scrambler	Mystery Fun House
Caverns of Callisto	Savage Island
Skybombers 11	The Russian Disk
Capitalization	Algebra II
Santa Paravia	Acey Ducey
Voodoo Castle	Merlin
Ghost Town	Routine Machine
Oil Tycoon	

MORE items at fantastic SAVINGS . . .

	List	Our Price
Cut Throat	39.95	24.95 ☐
Enchanter	39.95	24.95 ☐
Bank Street Writer	69.96	39.95 ☐
All Keyfax Products Prodos Multiplan Applewriter IIe Visicalc	12.95	5.95 ☐
Keyboard cover	9.95	4.95 ☐
Bank Street Storybook	39.95	24.95 ☐
Printographer	49.95	10.95 ☐
Microzine for Apple IIe	39.95	13.95 ☐
Archon	40.00	24.95 ☐
Cut & Paste	35.00	14.95 ☐
Financial Cookbook	35.00	29.95 ☐
Desecration	37.95	9.95 ☐
Accounting Plus II	395.00	14.95 ☐
The Last Gladiator	35.00	9.95 ☐
Basic Tricks for the Apple	24.95	13.95 ☐
Learn Apple Logo	19.95	14.95 ☐
Night Flight	24.95	19.95 ☐
HARD HAT MACK	35.00	12.95 ☐
Sky Fox	40.00	24.95 ☐
Murder on Zinderneuf	40.00	24.95 ☐
Seven Cities of Gold	40.00	24.95 ☐
Routine Machine	29.95	9.95 ☐
Merlin Apple IIE	30.95	9.95 ☐
Copycat Apple IIE	29.95	10.95 ☐
Sampler 1	29.95	11.95 ☐
Array	29.95	11.95 ☐
Pico Products Joysticks for ALL Apples	39.95	21.95 ☐

Modems

	List	Our Price
Anchor Mark x	159.95	99.95 ☐
Anchor Volksmodem	72.68	49.95 ☐
Black Jack	49.95	25.95 ☐

. . . . . Another Incredible PICO Product . . . . . .

Look at this great half-height 100% APPLE compatible disk drive. Suggested List Price $269.95. Instant Software priced at only **$189.95.**

WE KNOW OF NO BETTER DRIVE AT ANY PRICE!!!!!!

The benefits of owning this drive to you are:

- Faster, more precise tracking and larger capacity than standard Apple drives.
- Quieter and smoother running.
- 100% Apple compatibility for II+, IIe, and IIc external drives.
- Half-Height, compact design . . . saves you space.
- ONE YEAR WARRANTY.
- 30 day moneyback guarantee.

GLARE GUARDS FOR YOUR CRT

These screens are available for color or mono (please specify).
- Fine nylon mesh
- Easy attachment with velcro strips
- Reversible black or cream color
- prevents dust accumulation

Only 19.95 for 12" and 24.95 for 14"

Universal Joystick from PICO PRODUCTS

This great joystick will work with an Apple II, II+, IIe or IIc and comes complete with:

- 2 operating modes to give you "Auto-Centering" or "FreeFloating."
- 2 pairs of fire buttons for the left or right-hand user.
- New quick fire button!
- ONE YEAR WARRANTY, 30-day money back guarantee.
- Easy to use and extremely durable. List 39.95 **Sale 21.95**

Protect Your Software

FLIP 'N' FILE /15

Protect Software from dust, debris and moisture. Stores up to 15 5¼ diskettes.
List Price $9.95 **Sale $7.95**

Also Available	LIST	SALE
Flip 'n' File /50	$19.95	$14.95 ☐
Data Defender /35	$ 9.95	$ 7.95 ☐
Data Defender /70	$26.95	$19.95 ☐
Roll Top /100	$49.95	$39.95 ☐

Kill Spikes, Fight Surge!

MAXI Strip

Protect Valuable electronic equipment and data files from damage. Surge and spike suppressor and noise combination converts one outlet into six.

List $34.95 **WOW!!!** only **$19.95**

Also save on surge suppressors by CURTIS...

	List	SALE
Diamond	$49.95	$39.95 ☐
Emerald	$59.95	$49.95 ☐
Sapphire	$79.95	$69.96 ☐
Ruby	$89.95	$79.95 ☐

FAN FOLD COMPUTER PAPER

	LIST	SALE
15# 1000 Sheets	$14.96	$ 9.95 ☐
20# 1000 Sheets	$19.95	$14.95 ☐
20# 1000 Sheets micro-perfed	$19.95	$14.95 ☐
20# 2500 Sheets	$32.95	$26.95 ☐

CALL TOLL FREE 800-843-6700

or call our BBS 617-357-4306 operator 1105 (N.H.—603-352-3736)

Some quantities limited. Selection may vary.

instant Software

computer centers

or clip and mail coupon to Instant Software, 82 Main St., Keene, NH 03431 *call for shipping charges
MC, VISA, M.O. or check accepted. Add $3.00 for shippping and handling.

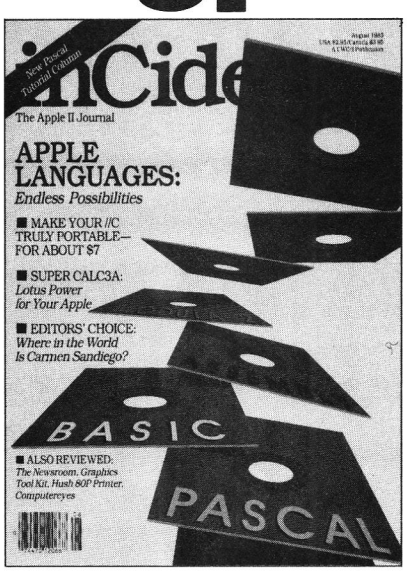
Name_____

Address_____

City_____ State_____ Zip_____

KEENE: 82 Main St. 603-352-3736 • **NASHUA:** Nashua Mall 603-889-0084 • **HUDSON:** 35B Lowell Rd. 603-883-8080 • **BOSTON:** 355 Boylston St. 617-353-1582 • **ACTON:** 427 Grest Rd. 617-263-0418

SAVE 30% ON 12 ISSUES OF



inCider

CW COMMUNICATIONS
PETERBOROUGH
80 Pine St., Peterborough, New Hampshire 03458

YES!

☐ Send me 12 issues of *inCider* for $24.97. Save **30%** off the cover price.

☐ 24 issues for $38.00. Save over **46%** off the cover price.

☐ Payment enclosed
☐ Bill me

Please make checks payable to *inCider*.

Name

Address

City

State Zip

Canada & Mexico $27.97, 1 year only. Foreign Surface $44.97, 1 year only. US funds drawn on US banks. Foreign airmail, please inquire. Please allow 6–8 weeks for delivery.

35DB5G

YES!

☐ Send me 12 issues of *inCider* for $24.97. Save **30%** off the cover price.

☐ 24 issues for $38.00. Save over **46%** off the cover price.

☐ Payment enclosed
☐ Bill me

Please make checks payable to *inCider*.

Name

Address

City

State Zip

Canada & Mexico $27.97, 1 year only. Foreign Surface $44.97, 1 year only. US funds drawn on US banks. Foreign airmail, please inquire. Please allow 6–8 weeks for delivery.

35DB5G

YES!

☐ Send me 12 issues of *inCider* for $24.97. Save **30%** off the cover price.

☐ 24 issues for $38.00. Save over **46%** off the cover price.

☐ Payment enclosed
☐ Bill me

Please make checks payable to *inCider*.

Name

Address

City

State Zip

Canada & Mexico $27.97, 1 year only. Foreign Surface $44.97, 1 year only. US funds drawn on US banks. Foreign airmail, please inquire. Please allow 6–8 weeks for delivery.

35DB5G

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough
inCider
P.O. Box 911
Farmingdale, NY 11737

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough
inCider
P.O. Box 911
Farmingdale, NY 11737

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough
inCider
P.O. Box 911
Farmingdale, NY 11737

SAVE 30% ON 12 ISSUES OF

inCider

CW COMMUNICATIONS
PETERBOROUGH
80 Pine St., Peterborough, New Hampshire 03458

perform fundamental analyses on any of the more than 1500 companies in its Composite Database—including leading corporations listed on the New York (NYSE), American (AmSE), and Over-The-Counter (OTC) Stock Exchanges.

Along with Stockpak II, you receive the copyable program disk, a "starter" data-base disk, and an owner registration card. When you return this card, you receive, at no additional charge, six monthly data-base disks, each containing company information and stock-market data accurate as of the last trading day of the previous month.

Though not exceedingly timely, Stockpak II is a tremendous time-saver. Within seconds, it provides information on one company or compares data on several companies.

Typing in ticker symbols from the directory listing in Stockpak II's slipcase lets you access information on any of the companies listed. More than 70 pieces of information on trading, balance sheets, and ratios are available for each company, and you can add your own ratios and constants to the data base.

You can print both data and graphics with an Imagewriter, Scribe, Silentype, or Epson printer, or another printer connected via a Pkaso or Grappler interface. All of the information for one company fits neatly onto one page, so you don't have to cut and paste or manipulate a paper pile.

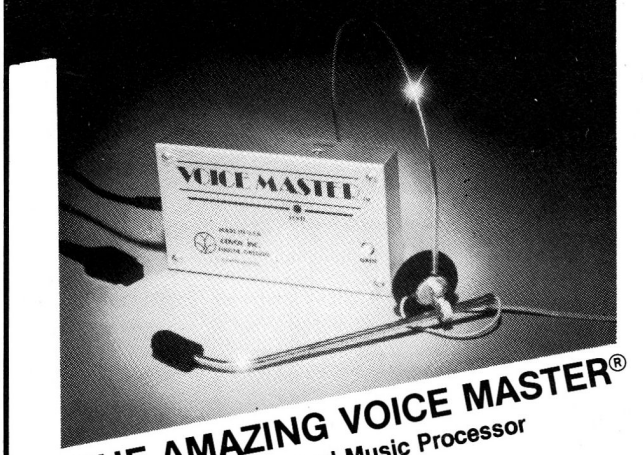
Stockpak II's lookup mode helps you investigate potential stocks or track stocks you currently own, but the Screening mode is its truly enticing option. You can screen the data base to seek out stocks that comply with preset parameters. The ten preprogrammed criteria sets include High Rank (companies with an S&P rating of A+), Income (companies whose yield is 12 percent or more), and Triple 10 (companies whose price earnings ratio is less than ten, whose yield is 10 percent or above, and whose sales have grown at least 10 percent).

The power of Stockpak II, though, lies in its versatility. Not only can you edit any of the built-in criteria sets, but you can define your own. As a real Yankee conservative, I configured a criteria set requesting a stock that wasn't overpriced with respect to its book value or the company's earnings, that sold at $20 or less, and that would give me an 8 percent return. I also wanted to invest in a company with net assets greater than my own.

To my pleasant surprise, this fairly complex search took only about 20 seconds and produced five companies meeting these criteria. When I further narrowed my selection to companies traded on the NYSE, I still had three good prospects.

You can then format a blank disk (called a Spinoff Diskette) to store the file containing the ticker symbols for the selected companies. From such a file, you can create sorted reports that provide side-by-side comparative data for the companies within that file.

It Talks!
It Recognizes!
It Writes Music!
and more . . .



THE AMAZING VOICE MASTER®
Speech and Music Processor

Your computer can talk in your own voice. Not a synthesizer but a true digitizer that **records** your natural voice quality—and in any language or accent. Words and phrases can be expanded without limit from disk.

And it will understand what you say. A real word recognizer for groups of 32 words or phrases with unlimited expansion from disk memory. **Now you can have a two way conversation with your computer!**

Easy for the beginning programmer with new BASIC commands. Machine language programs and memory locations for the more experienced software author.

Exciting Music Bonus lets you hum or whistle to write and perform. Notes literally scroll by **as you hum!** Your composition can be edited, saved, and printed out. You don't have to know one note from another in order to write and compose!

Based upon new technologies invented by **COVOX**. One low price buys you the **complete system**—even a voice controlled black-jack game! In addition, you will receive a subscription to COVOX NEWS, a periodic newsletter about speech technology, applications, new products, up-dates, and user contributions. **You will never find a better value for your computer.**

ONLY $89.95 includes all hardware and software.

For telephone demonstration or additional information, call **(503) 342-1271.** FREE audio demo tape and brochure available.

Available from your dealer or by mail. When ordering by mail add $4.00 shipping and handling ($10.00 for foreign, $6.00 Canada).

The Voice Master is available for the C64, C128, all Apple II's, and Atari 800, 800XL and 130XE. Specify model when ordering.

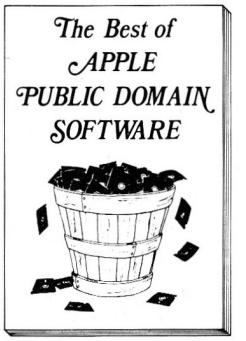
VISA MasterCard *For Faster Service on Credit Card Orders only:*

ORDER TOLL FREE 1-800-523-9230

COVOX INC. (503) 342-1271
675-D Conger Street, Eugene, OR 97402
Telex 706017 (AV ALARM UD)

Software for Pennies

Thousands of public domain software programs that you can freely copy for the Apple II/III/c and compatibles—are listed, described, and conveniently grouped by subject.



MAIL COUPON OR CALL TODAY

- ☐ **Set of 6 introductory disks plus book** $34.95
  (includes word processing, business, home management, education, utilities, and games)
- ☐ **Set of 3 tutorial disks** $15.00
  (tips on Applesoft, Integer BASIC, and machine language programming)
- ☐ **Set of 3 business disks** $15.00
  (database, check balancer, label maker, financial programs)
- ☐ **Set of 5 utility disks** $25.00
  (disk check, disk copier, text file editor, memory dump, file recovery)
- ☐ **Set of 5 education disks** $25.00
  (reading, spelling, math, history, typing, geography)
- ☐ **Set of 3 game disks** $15.00
  (Boggle, chess, roulette, Towers of Hanoi)
- ☐ **Set of 5 Eamon adventure disks** $25.00
  (Master and 4 popular adventures)
- ☐ **Book: "The Best of Apple Public Domain Software"** $6.95
  (plus $1.50 postage)

Include $4 shipping and handling for disk orders. CA residents include sales tax.
Please enclose payment with order: ( ) check ( ) VISA ( ) MasterCard

Card No. _____ Exp. Date _____

Ship To: _____

The Public Domain Exchange
673 Hermitage Place, Suite 6
San Jose, CA 95134
(408) 942-0309

Circle 186 on Reader Service Card.

LIFETIME LEARNING™ STARTS HERE

The gift of learning — start your child's Learning Library™ with affordable, quality software from Learning Technologies.

For Grades Pre K-3 select from:
Clowning Around, Flying Carpet, Learning to Add & Subtract, How to Weigh an Elephant, Let's Go Fishing.

Continue Your Library For Grades 4-8 With:
Scrambled Eggs, Alpine Tram Ride, Monkey Business, Sliding Block, Speedy Delivery.

TO ORDER OR FOR THE NAME OF THE DEALER NEAREST YOU CALL OR WRITE.

COST: $19.95 each. Please add 10% of total purchase price to cover shipping/handling. Texas Residents please add 5.125% sales tax. Guaranteed delivery in time for Christmas.

ORDER INFO: Send Check, Money Order or Credit Card # (Visa/MasterCard). Credit Card orders call Toll Free 800-238-4277. Specify Name of Program(s) and computer. Available for Apple II family and Commodore 64 or 128.

SATISFACTION GUARANTEED: 100% Money Back including shipping if not completely satisfied.

Learning Technologies Dept. I
4255 LBJ Fwy., Suite 131,
Dallas, Texas 75244, 214-991-4958.

© 1985 Learning Technologies, Inc.

REVIEWS

Stockpak II is not cheap, though. Once the initial, "free" six-month subscription is exhausted, you must renew your subscription yearly to a data base—the Composite Database, the NYSE (1500 companies), the AmSE (800 companies), or the OTC Stock Exchange data base (2300 companies).

Keep in mind that financial data bases you access by modem can be prohibitively expensive in terms of subscription cost, hourly connect-time rate, and pound of flesh extracted by the telephone company. But, print media—even the venerable *Wall Street Journal*—cannot compete with this software's versatile screening and reporting capabilities.

Because of the market's volatility, however, Stockpak II should not be your only investment tool. When coupled with current news reports and timely quotes from other sources, Standard & Poor's new software can help you effectively exercise your own investment philosophy.■

Cynthia E. Field
Wakefield, RI

Willy Byte in the Digital Dimension

datatrek
621 Second Street
Encinitas, CA 92024

Educational game (computer operation)
Any Apple II, 48K
$34.95

★★	Ease of set-up
★	Ease of use
★★★	Documentation
★★	Support
★★	Overall

You are about to enter a new dimension in personal computing—the Digital Dimension, an area that familiarizes you with the inner workings of your computer. With your companion, Willy Byte, you make your way through this game on a quest for computer knowledge. Unfortunately, the difficulty of playing Willy Byte diminishes the program's learning potential. At times, it's so frustrating that you want to quit and remain blissfully ignorant.

The color graphics, though, are outstanding. And with an Apple //e, Mockingboard sound card, and A-Max audio, we enjoyed the voice and high-quality music featured in this program. (You can use the program without these peripherals, but you won't hear Willy's comments.)

Your mission is to build a message and successfully send it through the proper computer components. You maneuver Willy on and off the many buttons in the on-screen central processing unit (such as the keyboard, RAM, and disk drive) that comprise the options menu. You can go to one place, complete your task, and return to the CPU to choose another. Or,

Circle 93 on Reader Service Card.

you can plan a flowchart to program your game play and visit all the components needed for getting your message through the Digital Dimension.

And the Message Is. . .

For example, you might construct a flowchart for a simple one-character message, such as the letter A: KEYBOARD> RAM> IF-THEN> DISK. You start at the keyboard, then go to RAM. Once Willy presses the power button in the keyboard room, the first character of the message appears at the top left of the screen, and its hexadecimal equivalent at the top right. Willy, an animated character with a head that looks like a helmet, must push eight balls down long poles representing the 8 bits in one character, or byte. Static balls that punch gaps in the poles thwart his mission, however.

If your message carries an error, the flowchart will take you to the trouble spot where you can correct it. Eventually, you'll get your message to the Disk Drive. At game's end, the program gives you an efficiency rating and a chance to enter your name in the Top Eight List of Willy Byte-ers.

Willy keeps your interest up throughout the game as he talks, grumbles, and cheers you on in his gravelly, digitized tone. "Oh, wow" and "all right" are his favorite exclamations.

Although the flowcharting game play isn't thrilling, the visual display showing the relationship between ASCII (American Standard Code for Information Interchange) characters and their hexadecimal- and binary-byte counterparts is effective.

Once you move your byte safely to the bottom of the keyboard screen, it's whisked away from view. You then maneuver Willy to the RAM screen, where he must tug the bytes out of a tunnel and put them into certain slots. Here, adversary Hex Luthor attempts to foil Willy's work by exposing the bytes to extreme heat, water, and loss of power—common environmental hazards to your computer. The graphics in this section help get the warning across. The program, though, contains just too many obstacles—you must be highly motivated to continue your struggle to Disk Drive.

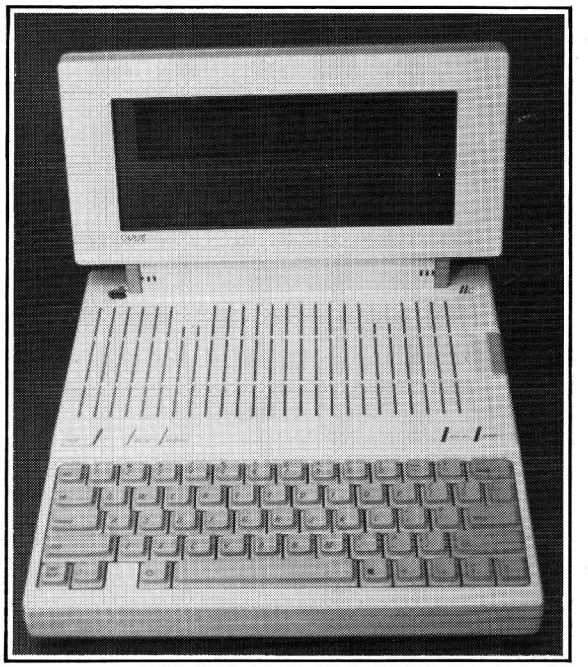
Three additional screens complete Willy Byte: the Power, the Clock, and the Map. The Power is graphically very interesting—it's a vivid red even on a television hook-up. As a game feature, the Clock brings attention to this often-neglected computer component. The Map screen displays all the machine's components together while remarkably complex computer music plays in the background.

Willy Byte creatively uses design, color, voice, and music with a great deal of skill. The learning concept behind Willy Byte is laudable; if the quality and ease of game play were nearer the level of Lode Runner, for example, it would deserve rave reviews.■

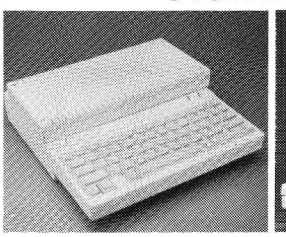
Anita Malnig
Steven Kaufman
San Francisco, CA

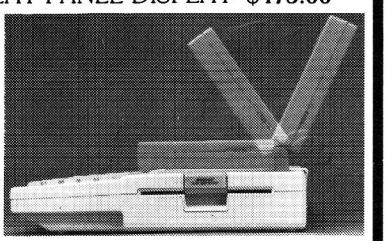
C·VUE™

Flat Panel Display - portable, lightweight, attachable, adjustable flat panel display system for the Apple IIc Computer.



C-VUE FLAT PANEL DISPLAY **$475.00**





C-VUE FEATURES:

- Full 80 character by 24 line display, including graphics.
- Display panel adjust to any viewing angle.
- Contrast adjustment control.
- Display panel folds down on top of the Apple IIc Computer.
- C-VUE display and Apple IIc easily fit into the Apple IIc carrying case.
- C-VUE display system is easily attached or removed from the Apple IIc.
- C-VUE offers excellent contrast and greater viewing area.

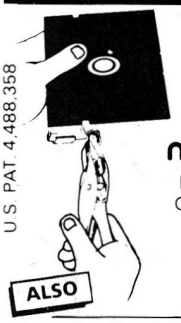
To order your C-VUE Flat Panel Display System for the Apple IIc call Sun Star Industries, Inc. 1-800-821-7493 Ext. 404. In AZ call (602) 968-0373.

All orders are shipped UPS C.O.D. unless payment is made by VISA or MasterCard. Add 2% for shipping and handling. Purchase orders will be accepted subject to credit approval. Arizona residents add sales tax of 6%.
Canadian Orders: Price is subject to currency fluctuations. Call for price.
International Orders: All orders placed for delivery outside the Continental United States must be pre-paid by certified check only. Add 3% for shipping and handling.
Educational Discounts are available to qualified educational institutions.
VISA and MasterCard accepted.

Apple IIc is a registered trademark of Apple Computer Inc.

Circle 182 on Reader Service Card.

IT'S LIKE
FREE DISKETTES



U S PAT 4,488,358

Your 5¼" single side disks are usable on the other side. You paid for one side, why not use the other... **IT'S FREE!**

Nibble Notch will **open** your **new** disk. It's easy... won't harm existing data. Try it!

nibble notch I
For Apple, Franklin, Commodore & Atari (w/Atari Drives); square notch.
only $14.95* PLUS P&H

nibble notch II
For all other computers; square notch & index hole.
only $21.90* PLUS P&H

ALSO

DISK OPTIMIZER II©
Apple II Series Software
Pro DOS • DOS 3.3 • Pascal
Examines your **new** disk, locks out bad sectors and **certifies it 100% ERROR-FREE** in 30 seconds or less!
Also checks drive speed... and more!

SUPER SAVER PACKAGE
Nibble Notch I and Disk Optimizer Combo (Optimizer alone reg. $24.95)
$29.95* FOR BOTH!

QUALITY DISKETTES low as 99¢

*add $2 ($5 frgn) for P & H. Fl. Res. add 5% Sales Tax

Toll Free 1-800-642-2536
FL 1-305-748-3770
OR SEND CHECK OR MONEY ORDER TO:

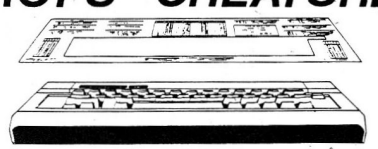
VISA MasterCard

nibble notch® computer products

4211 NW 75th TERRACE, • DEPT. 214 LAUDERHILL, FL 33319

Circle 100 on Reader Service Card.

HAVING TROUBLE REMBERING ALL THE COMMANDS FOR YOUR PROGRAMS??
YOU NEED
LEROY'S CHEATSHEET®



KEYBOARD OVERLAYS FOR THE
Apple® IIe & IIc
THE QUICK AND EASY SOFTWARE DOCUMENTATION

Forget about constantly referring back to the manual for operating commands. Discover all the "special" commands buried in the manuals. LEROY'S CHEATSHEETS® are sturdy plastic laminated help sheets designed for use with popular software, hardware and languages for APPLE *IIe* & *IIc* computers. Commands are grouped together for logical use. You learn and use your programs faster and easier

IIe Cheatsheets are **DIE CUT** overlays designed to fit over the keyboard

only $5.95 each

IIc Cheatsheets are 7 x 10¾ reversible plastic laminated **reference cards**

With LEROY'S CHEATSHEETS® you will never have to hunt for a command again.

WORD PROCESSORS
APPLE WRITER II
SCREENWRITER II
SPEEDSCRIPT (COMPUTE!)

PRINTERS
EPSON RX & FX 80 & 100
GEMINI 10X & 15X
IMAGEWRITER
OKIDATA MICROLINE 92 & 93

MISCELLANEOUS
BLANKS (SET OF 3)
FLIGHT SIMULATOR II
FOR THE BEGINNER (DOS 3.3)
GRAPPLER + / PRINT WORKSHOP

BUSINESS
APPLEWORKS
MULTIPLAN
PRACTICALC II
SUPERBASE
VISICALC

LANGUAGES
BASIC (Dos 3.3)
LOGO (APPLE)
LOGO (TERRAPIN)

MORE DESIGNS ON THE WAY
CIRCLE YOUR CHOICES

☐ IIe (overlay) ☐ IIc (card)
QTY. _____ X $ 5.95 = $ _____
SHIPPING $ 1.00*
* U.S. & CANADA $1.00 FOREIGN ORDERS $3.00 CHECK, M.O., MC/VISA U.S. FUNDS NO C.O.D.
6% TAX (PA. ONLY) $ _____
TOTAL $ _____
MC/VISA # _____
EXPIRATION DATE _____
NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

CHEATSHEET PRODUCTS INC.
P.O. Box 111368 Pgh., PA 15238
(412) 781-1551 cidr 12

MasterCard VISA

REVIEWS

Think Fast

Brainpower
24009 Ventura Boulevard
Calabasas, CA 91302

Memory training
$39.95

★★	Ease of set-up
★	Ease of use
★★	Documentation
★★	Support
★	Overall

Can you improve your memory by answering series after series of increasingly difficult questions? Think Fast claims you can, and the tests are fun at first—but taking them really doesn't teach you anything.

Questions supposedly address alternate sides of your brain. You begin each test by choosing speed (fast, medium, or slow), level of difficulty (the number of questions you must answer correctly to move to the next test), and risk level (how many points your correct and incorrect answers will be worth). You then tell the program the number of questions you want each test to include and whether you want to begin with a right-brain or a left-brain question.

Right-brain questions consist of small squares filled in with smaller rectangles or triangles; left-brain questions involve letters and numbers. There are only three types of questions—*compare*, *recall*, and *copy*—and the program uses two of them for both right- and left-brain tests. The discussion in the manual of the left and right halves of the brain is simplistic and misleading, and the test questions seem to blur even the few distinctions the manual makes.

Comparison questions address both halves of the brain. This type shows you two sets of letters, numbers, or filled-in squares, and you decide if they're the same or different. Two boxes with the words "Same" and "Different" are at the bottom of the screen. If the correct answer is highlighted, press the space bar to enter it. If the wrong answer is highlighted, use the right or left arrow key to highlight the correct answer, then press the space bar. "Same" is above "Different" on the screen, but you use the left and right arrows to move between them—an unnecessarily confusing procedure.

Copy questions (for the right brain only) show you squares partially filled in with smaller triangles and rectangles. The filled-in squares appear on the left side of the screen and the empty squares on the right. Along the bottom are eight different filled-in squares; a box surrounds one of them. You fill in the blank squares by moving this box with the arrow keys. When you reach a square you want to copy, press the return key and an empty square is filled in. Using the return key to enter some correct answers and the space bar to enter others is inconsistent, and the directions for the copy questions are cumbersome.

Recall questions (for the left and right brain) ask you to memorize filled-in squares, letters, or numbers. The program displays them on screen so that you can concentrate on them. When they disappear, you type in the letters or numbers, or select the correct squares as you did with the copy questions.

At advanced levels, "overlay-trial" questions interrupt the other three types of questions. According to the manual, "overlays are easily recognizable if you are using a color monitor, since the screen background changes from blue to red." I used Think Fast on an RGB color monitor—the color was terrible, and the letters and numbers were almost impossible to read. And, on a monochrome monitor, the text was difficult to read because of the program's patterned background. The documentation says nothing about recognizing overlay trials on a monochrome monitor—and for good reason—they're difficult to distinguish from the questions.

When you've answered all the questions, you get a summary report that includes your total score (based on speed, difficulty, and risk level), left-brain score, right-brain score, number of questions attempted, and number of questions answered correctly. These reports show only your scores—they don't repeat or discuss actual questions. Viewing the questions you missed and having a chance to redo them before going on might make Think Fast more valuable as a teaching tool.

After you read the summary report, the program asks you if you want to print it, and takes you automatically to the reports menu, where you choose among various report options. One of the big problems with Think Fast is that if you simply want to take another test, you can't. You have to go through the report options—a process that takes at least a minute—before you can even return to the main menu.

If you want to continue from your last test, getting back to it can take even longer, because the program stores all the tests chronologically. For example, if your last test was number 37, you have to scroll through the first 36 tests to reach it—you can't simply type in your last test name or number.

Think Fast certainly exercises your memory, but I'm not sure it improves it. I spent several hours with it, as did one of my students. Although our scores rose as we became more familiar with the system (the manual's directions for entering correct answers were confusing), Think Fast did not enhance our memories. Using the system for several weeks or months might have some effect on yours, but when you consider how frustrating Think Fast is, you won't want to take the time to find out. ■

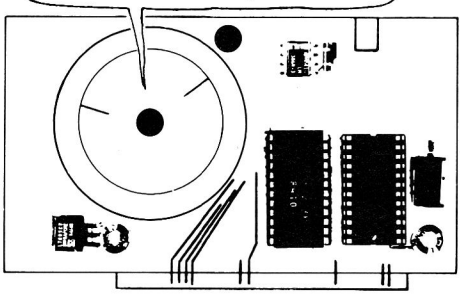
Libby Koponen
Westport Point, MA

Votrax Announces

VOTALKER IB & AP

New Industry Standards For Talking Personal Computers. Exclusively for IBM PC and XT, Apple II, and Compatibles. From Votrax, The Pioneer in Synthetic Speech Systems.

Give your IBM PC and XT and Apple II the Power of Speech



Until Votalker IB and AP, synthetic speech systems for personal computers were like a piano with 50 keys, an eagle with a broken wing, and a singer with a two-octave range. When Votrax developed the SCO2 speech synthesis chip, it was the classic case of advanced technology in need of support systems to unlock its dormant powers. Now, Votalker introduces a revolutionary family of text-to-speech translators — the key to the lock. First members of the family are the Votalker IB for IBM PC and XT and the Votalker AP for Apple II, Apple IIe, and Apple Plus. With Votalker these units play the piano with all 88 keys. Soar through unlimited vocabulary, using 32 inflections and 4,100 pitch settings. Sing in five octaves, and generate sound effects in 16 amplitudes.

A Newly Designed Circuit Board includes: • SCO2 chip • speaker • audio amplifier • volume control • external speaker jack. The board operates in the host computer slot, eliminating the need for serial ports and cable hookups. Internal editing and smoothing ensure clarity and integrity of speech.

The Text-To-Speech Translator sets Votalker above all other synthetic voice products. Text is generated through programs or keyboard and translated directly into spoken language. The sophisticated software on a diskette offers: • unlimited vocabulary • little use of system memory • exception table that stores and accurately pronounces difficult words.

Other Votrax Products — the stand-alone Personal Speech System and Type 'N Talk — are currently used in thousands of applications.

Votalker Prices Begin at $179

Call Votrax at **(800) 521-1350***

votrax

VOTRAX, INC.
1394 Rankin
Troy, Michigan 48083
(313) 588-2050
*In Michigan, Call Collect
(313) 588-0341

EXTRACT

A reprise of the reviews that have appeared in inCider *in the last four months. Prices subject to change without notice.*

★★★★	Excellent
★★★	Above average
★★	Good
★	Not up to standards
☆	The empty set

Hardware

Carl Portable Powered Work Station
★★
Discwasher
1407 North Providence Road
P.O. Box 6021
Columbia, MO 65205
Portable power supply and attractive carrying case for the //c, October '85
$249.95

Centronics GLP
★★
Centronics Data Computer
1 Wall Street
Hudson, NH 03051
Low-cost dot-matrix printer, September '85
$299

ComputerEyes
★★★
Digital Vision
14 Oak Street, Suite 2
Needham, MA 02192
Slow video acquisition system, August '85
$129.95

Graphics Tool Kit
★★★
Demco Electronics
10516 Grevillea Avenue
Inglewood, CA 90304
Professional graphics expansion card and software, August '85
$595

Hush 80P
★★
Ergo Systems
26254 Eden Landing Road
Hayward, CA 94545
Dot-matrix thermal printer, August '85
$159.99

Juki Model 6000
★★
Juki Office Machines
23844 Hawthorne Boulevard, Suite 101
Torrance, CA 90503
Slow, inexpensive letter-quality printer, October '85
$300

Juki 6300
★★★
Juki Office Machines
(See previous address reference)
Letter-quality daisy-wheel printer, sturdy, quiet, and fast, November '85
$995

MW-100 C-Print Interface
★★★★
Micro-W Distributing
1342B Route 23
Butler, NJ 07405
Parallel-printer interface for the //c, October '85
$99.95

Serial-to-Parallel Adaptor
★★★
Discwasher
(See previous address reference)
Parallel-printer adapter for the //c, September '85
$129.95

Slot Buster
★★★
RC Systems
121 West Winesap Road
Bothell, WA 98012
Gravelly text-to-speech synthesizer, September '85
$229.95

Software

Better Working Series: Spreadsheet and **File & Report**
★
Spinnaker Software
One Kendall Square
Cambridge, MA 02139
Illogical spreadsheet and senile data base with awkward integration. September '85
$59.95 each

B/Graph
★★
Batteries Included
30 Mural Street
Richmond Hill, Ontario
Canada L4B 1B5
Primitive presentation graphics and simple statistics, November '85
$39.95

Creative Calc, **Creative Writer**, and **Creative Filer**
★★
Creative Software
230 East Caribbean Drive
Sunnyvale, CA 94089
Slightly "integrated" spreadsheet, word processor, and data base, August '85
$49.95 each

Keyboarding Alpha-Pac
★★★★
Southwestern Publishing
Consumer Products Division
5101 Madison Road
Cincinnati, OH 45227
Typing teacher that works with graphics, November '85
$39.95

Keys to Responsible Driving
★★★★
CBS Software
One Fawcett Place
Greenwich, CT 06836
Driver education for novice or experienced motorists, September '85
$79.95

MerlinPro and **Wizard's**, **Database**, and **Chart 'n Graph Toolboxes**
★★★★
Roger Wagner Publishing
10761 Woodside Avenue
Santee, CA 92071
Assembler that accelerates Applesoft; tools for specific applications, November '85
$99.95 (MerlinPro), $39.95 each toolbox

Mr. Pixel's Cartoon Kit and **Programming Paint Set**
★★★
Mindscape
3444 Dundee Road
Northbrook, IL 60062
Introduction to programming through graphics for children, August '85
$34.95

Mouse Calc
★★★★
International Solutions
910 West Maude Avenue
Sunnyvale, CA 94086
Spreadsheet and graphics with Parisian panache and 128K, October '85
$149

The Newsroom
★★
Springboard Software
7807 Creekridge Circle
Minneapolis, MN 55435
Printer utility for newsletter creation, August '85
$49.95

Nutri-Byte
★★★
ICS Consultants
14 East 14th Street
New York, NY 10003
Thoughtful weight reduction and behavior modification for the terminally shy, September '85
$79.95

Original Boston Computer Diet
★★★★
Scarborough Systems
55 South Broadway
Tarrytown, NY 10591
Simulated counseling in weight reduction, September '85
$79.95

Perfect Writer, **Perfect Calc**, **Perfect Filer**, and **Perfect Link**
★★★
Thorn EMI Computer Software
3187C Airway Avenue
Costa Mesa, CA 92626
Not-so-fast integrated word processor, spreadsheet, data base, and telecommunications for 64K and 80 columns, August '85
$139 each (Writer, Calc, Filer)
$109 (Link)

Picture Perfect
★★★
Mindplay
82 Montvale Avenue
Stoneham, MA 02180
Graphics and storytelling for the wee ones, with mouse, joystick, or graphics tablet, September '85
$39.99

ProImage
★★
Interactive Arts
2715 Porter Street
Soquel, CA 95073
Animation design for the dedicated software engineer, October '85
$69.95

Rainbow Painter
★★★
Springboard Software
(See previous address reference)
Graphics for all ages, with keyboard or mouse, September '85
$34.95

Story Maker
★★★
Sierra
P.O. Box 485
Coarsegold, CA 93614
Story construction for unpublished youngsters, September '85
$34.95

WillWriter
★★★★
Nolo Press
950 Parker Street
Berkeley, CA 94710
Legal assistance with one of the certainties, September '85
$39.95

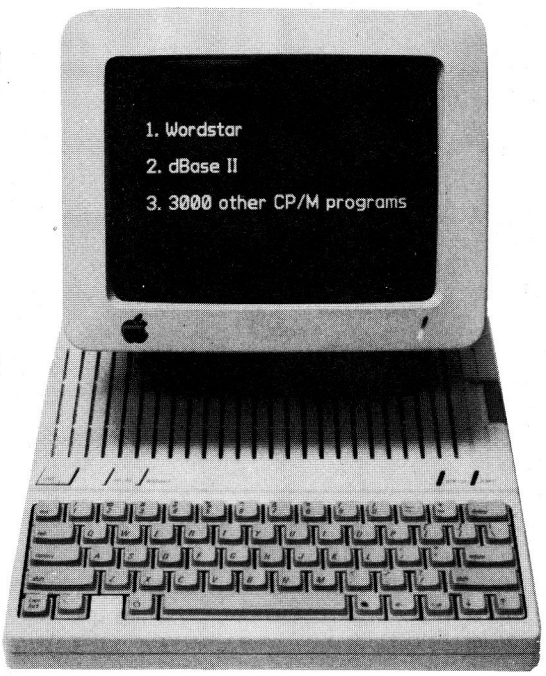
CP/M for the APPLE IIc

Apple IIc owners can now run the single largest body of software in existence. Enter the CP/M world with the new Z-80c from Applied Engineering and introduce your IIc to thousands of new programs. With the Z-80c, you'll be able to run Wordstar, dBase II, Turbo Pascal and thousands of other programs that require CP/M. But your IIc will still be your IIc because the Z-80c only turns on when using a CP/M disk.

The Z-80c comes standard with the new 4.0 software, the most advanced system for running CP/M programs ever. But it also runs other versions of CP/M including the popular 2.2 and 2.23 and is fully compatible with Microsoft disks with no pre-boot.

But naturally you'd expect top performance from the Z-80c. After all, it's from Applied Engineering and we've got years of experience with Z-80 cards for the II+ and IIe.

The Z-80c can use all 128K in the IIc, or 64K can be reserved as a RAM disk.



The Z-80c fits neatly inside the IIc. Installation is easy and only takes about 10 minutes (it just plugs in). After installation, your IIc will act and look just like other IIc's, only now you can run all that great CP/M software that others can only dream about.

The Z-80c comes complete with Z-80 card, 4.0 operating system, utility disk, a plain English owners manual and a 5 YEAR WARRANTY. And although the Z-80c is the only CP/M interface on the market for the IIc, we've priced it as though the competition was fierce.

When you consider the fact that many people spend 2 or 3 thousand dollars on a CP/M only computer, our price of $159 is an offer that's practically irresistible.

The Z-80c will give you two computers in one and the advantages of both, all at an unbelievably low price.

Call (214) 241-6060
9 a.m. to 11 p.m.
7 days a week
Send check or money order
P. O. Box 798
Carrollton, Texas 75006

MasterCard, Visa and C.O.D. welcome. No extra charge for credit cards.
Texas residents add 5⅛% sales tax.
Add $10.00 if outside U.S.A.

APPLIED ENGINEERING
"We Set the Standard"

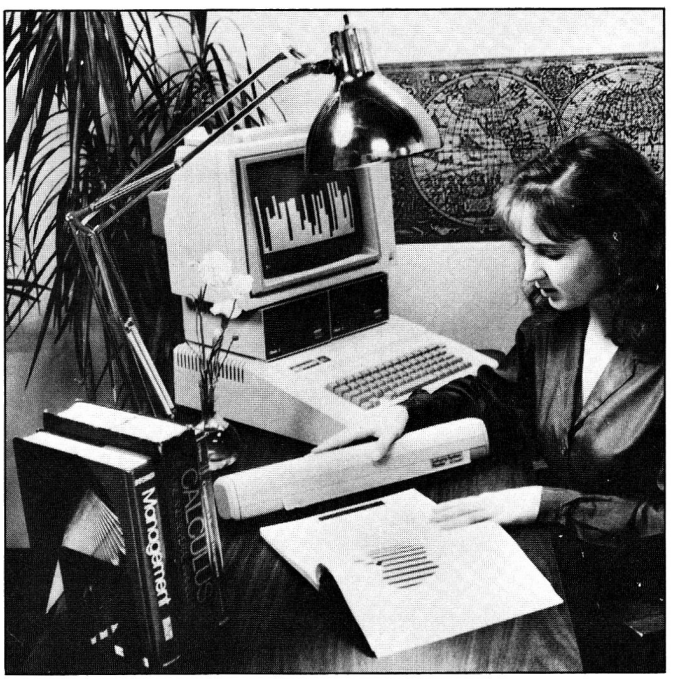
NEW PRODUCTS

edited by Paul Statt

Soft Touch

The **Cauzin Softstrip System** is an encoding and reading technology that prints software listings—data, programs, graphics, sound, and so on—in bar-code form on any paper in highly condensed form, and reads them, without error, into your Apple II. Softstrip data strips are printed graphics patterns, typically 9½ by 5/8 inches, that represent code for 5500 bytes of information. The Softstrip Reader connects to your Apple through its RS-232 port; its on-board microprocessor typically reads a strip into RAM in less than 30 milliseconds. Cauzin will license major software authors and publishers to write Stripware next year. The Softstrip Reader sells for $199, from Cauzin Systems, 835 South Main Street, Waterbury, CT 06706, (203) 573-0150. For more information circle number 356 on the Reader Service card.

Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider *of any given product.*



The Cauzin Softstrip System: bar-code printing and reading technology for Apple II's.

CP/M Source

The Apple CP/M Book covers the fundamentals as well as the finer points of CP/M operations, including the major utilities—STAT, PIP, ED, SUBMIT, and DDT—the Basic Disk Operating System (BDOS) and its routines, and more. *The Apple CP/M Book* is designed for Apple II, II Plus, and //e users, covering all four versions of Microsoft's Basic Input Output System (BIOS) and suggestions for debugging. The 144-page volume retails for $12.95 from Scott, Foresman and Company, 1900 East Lake Avenue, Glenview, IL 60025, (312) 729-3000. For more information circle number 362 on the Reader Service card.

Road Test

Response Time checks your reaction and response time, and by extension, your level of intoxication. The simple keyboard program tests and records your reactions to a random beep signal. Ten rapid tests combine to give you a score that you can measure against a friend's, a highway patrolman's, or your personal best. Test fatigue, disability, and dependability as well as drunkenness. Response Time costs $39 from Andent, 1000 Ninth Avenue, Waukegan, IL 60085, (312) 223-5077. For more information circle number 364 on the Reader Service card.

Fast Talking

The **Apple-Mate 1200 Modem** has resident communications firmware that runs on your II Plus or //e right out of the box. The Apple-Mate also supports commercial communications software through the resident Hayes AT Command Structure. The Apple-Mate 1200 dials automatically, answers automatically, adapts to speeds automatically, adapts to parity automatically, and more—all you do is type. The Apple-Mate 1200 sells for $299, from Cermetek Microelectronics, 1308 Borregas Avenue, P.O. Box 3565, Sunnyvale, CA 94088, (408) 752-5000. For more information circle number 359 on the Reader Service card.

Apple with Everything

The Works! collects all the applications software your home needs into one valuable package. On a single side of a single disk you'll find 13 integrated modules, such as a graphics painter, typing tutor, letter writer, calculator, music maker, family-finance planner, and five more. The Works! will prove the worth of your domestic computer, for $49.95, from First Star Software, 18 East 41st Street, New York, NY 10017, (212) 532-4666. For more information circle number 361 on the Reader Service card.

It Figures

The **Electronic Figure Book** makes a permanent record of your calculations and notes—it works on the computer as your old-fashioned figure book did in your hand. You choose between a text mode, in which you type in words, and a compute mode for calculations and computer programs. Everything you see on the monitor is saved. The Electronic Figure Book is an aid to engineers, teachers, and administrators who like to keep a record of their calculations with descriptive notes. It is available from Butterfly Computer Products, P.O. Box 525, Murrysville, PA 15668. For more information circle number 358 on the Reader Service card.

Color Me

ColorMe gives children the creative freedom to design their own pictures on the Apple screen, then print them out. ColorMe picture disks with Rainbow Brite, Shirt Tales, Hugga Bunch, and Tink! Tonk! characters are available. Children can print their favorite characters into coloring books, or onto the buttons and stickers in the ColorMe Supply Box. ColorMe is for children aged 4 and older, and sells for $29.95. Picture disks and Supply Box are $9.95 each, from Mindscape, 3444 Dundee Road, Northbrook, IL 60062, (312) 480-7667. For more information circle number 351 on the Reader Service card.

PFS:Plan helps you quickly create budgets, forecasts, and analyses.

Make a New Plan

PFS:Plan is an electronic spreadsheet that, like its siblings Graph, Write, and Chart, is easy to learn and use. Businesspeople and professionals can quickly create budgets, forecasts, "what if?" analyses, break-even analyses, and loan analyses. You can quickly transfer data from PFS:File into PFS:Plan, and easily include Plan output in PFS:Write documents. With the unique "target" feature, you can start with a desired result and let Plan tell you how to get there. PFS:Plan requires 128K, and works with the Apple II RAM Expansion Card and UniDisk 3.5. It sells for $125, from Software Publishing, 1901 Landings Drive, Mountain View, CA 94043, (415) 962-8910. For more information circle number 353 on the Reader Service card.

Equals Plus Equals. . .

Equations: The Game of Creative Mathematics teaches while you play. Equations becomes more complex as you learn, and that creates problems for the other players. Eight-year-olds can play with simple arithmetic, but Equations expands to present concepts that will challenge intelligent adults. Students from primary school to high school have played with Equations and shown improvement in performance. Equations was created by The Instructional Gaming Group at the University of Michigan, and is available for $44.95, from WFF 'N Proof Learning Games, 1490 South Boulevard, Ann Arbor, MI 48104, (313) 665-2269. For more information circle number 360 on the Reader Service card.

Invest Wisely

Investment Analysis for Stocks, Bonds, and Real Estate provides potential or current investors with the internal rate of return and year-by-year—for up to 40 years—cash-flow analysis. The analysis is easy to implement. Just fill in the blanks with your tax bracket and amount invested—the computer does the rest. The internal rate of return compares different types of investments, say, mutual funds and Vermont acreage, with a single number. Investment Analysis is fully documented and copyable, and sells for $89, from Larry Rosen Company, 7008 Springdale Road, Louisville, KY 40222, (502) 228-4343. For more information circle number 363 on the Reader Service card.

Kids can design and print their own pictures with Mindscape's ColorMe.

Circle 49 on Reader Service Card.

PROFESSIONAL HANDICAPPING SYSTEMS

• PRESENTED BY PROFESSOR JONES •

GLD. Thoroughbred "Gold" Edition™
A "Full" featured thoroughbred analysis designed for the professional and the serious novice. **$159.95** complete

EGLD. Enhanced "Gold" Edition™
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke." (Master Bettor™ included) **$199.95** complete

GLTD. Limited "Gold"™
Enables **Professional Handicappers** to assign specific values to the racing variables "they" feel are important. Create program weight based on a particular track and fine tune it for **maximum** win percentage. This program is designed for "ease of use". The user needs **no programming experience.**
(contains Integrated Bettor™) **$299.95** complete

GD. Gold Dog Analysis™
The "ONLY" professional greyhound analysis available that evaluates ALL variables. **$149.95** w/integrated Bettor **$199.95**
Limited Version **$299.95**

MHH. Master Harness Handicapper™
Professional software designed to provide a thorough analysis of all trotter and pacer races in North America and Canada. **$159.95** complete
$199.95 w/Integrated Bettor Limited **$299.95**

Professor Pix Football™
Complete STATISTICAL ANALYSIS on Data Base allowing "Designated" previous games to be evaluated. Statistical Series **$99.95**
w/Win-Loss Power Ratings **$149.95**

NBA. Basketball™ NBA **$99.95** w/college **$129.95**
w/power ratings **$149.95**

LOT. Lottery Analysis™
Statistical comparison program designed to detect subtle patterns in winning numbers and digits. Lottery (3-4 digit) **$79.95**
w/Lotto (Max. 99 Digit) **$99.95**

PC-3 Portable Computer (4k) with choice of Thoroughbred, Greyhound or Trotter™ **$249.95** (Includes portable computer and program.)

M-100 Portable (24k) w/choice of Thoroughbred, Greyhound, or Trotter. **$649.95** (Includes portable computer and program.)

BROCHURE AVAILABLE

IBM™
APPLE™
TRS-80™
CPM™
COMMODORE™

Prof. Jones
1940 W. State St.
Boise, ID 83702

VISA MasterCard

48 HR. FREE SHIPPING

CALL
208-342-6939

TERMS: FREE SHIPPING ALL SOFTWARE. Add $6.00 hardware / $6.00 C.O.D. / UPS Blue $6.00 / Out of Country $9.00 / ID Residents 4% / 3 weeks personal checks / Cash price only, add 2% Visa, MC / Prices subject to change.

Power Problems?

SURGES! SPIKES! RFI/EMI! DIPS! SAGS! BLACKOUTS! BROWNOUTS!

AEGIS™. . . Power Conditioning Equipment . . . THE SOLUTION
Protects From Damaging Voltage Surges, Lost Data, & Costly Down Time

SPIKE-SPIKER®
Transient Voltage Suppressors & Noise Filters
Eleven Models — All Models Rated 120V, 15A

Deluxe Power Console—2-stage transient absorber; dual 5-stage filter; common & differential mode protection; nano seconds response; clamping at 150V; 8 individually switched sockets; fused; main switch; 7' cord and status lite. **$97.95**

Quad Power Console—6-stage transient absorber; dual 5-stage filter; common & differential mode protection; pico second response; clamping at 131V; four outlets; fused, master switch; 7' cord and status light. **$82.95**

Mini II—*Direct AC Plug-In;* 2-stage transient absorber; dual 3-stage filter; common & differential mode protection; nano second response; clamping at 150V; two outlets and status lite. **$45.95**

LINE-SAVER™
Standby Uninterruptible Power System
—Clean Reliable Power System—

Model LS-240—240 watts—VA capacity—**$549°°**
Model LS-480—480 watts—VA capacity—**$795°°**

Back-up time: 11 min. full load, 27 min. ½ load, 43 min. ⅓ load; multiple-AC outlets, 3-staged transient protection; 4-staged RFI/EMI filter; sealed rechargeable internal battery; master control switch; test switch; external fuses; detachable 6' cord; external DC connectors for mobil use and extended hold-up time; many more exclusive features.

Call or write for free literature.
Dealer inquires invited.

KALGLO®
6584 Ruch Rd., Dept. **INC**
Bethlehem, PA 18017

Available at your local dealer or from Kalglo
800-524-0400 in PA 215-837-0700
SPIKE-SPIKER™ orders add $3.00 shipping & handling
LINE-SAVER™ orders add $10.00 shipping & handling
COD add additional $3.00
PA residents add 6% sales tax
REPS-TERRITORIES AVAILABLE

NEW PRODUCTS

Extra Help

Homework Helper Math Word Problems and **Homework Helper Writing** teach secondary students step-by-step methods for working through the two most difficult hours of homework: algebra problems and starting to write. By means of a series of questions and prompts, Homework Helper Math Word Problems leads the student through the process of building the proper equation from the information written in the text. Homework Helper Writing eases the student through the most common types of assignments: book reports, essays, and research papers. Prompts and questions get the writer over the critical "block" that the blank page presents. The Homework Helper techniques were developed through research with junior- and senior-high-school students. The programs are available for $39.95 each from Spinnaker Software, One Kendall Square, Cambridge, MA 02139, (617) 494-1200. For more information circle number 355 on the Reader Service card.

Cheat, Cheat

Leroy's Cheatsheets are plastic-laminated keyboard overlays designed for use with popular software, hardware, and languages for your Apple //e. The commands are arranged by function in programs such as Applesoft BASIC, Apple Writer, and VisiCalc, and printers like Apple's Imagewriter. (There's even an overlay for Flight Simulator.) Blanks are available for programmers. Each overlay costs just $5.95, from Cheatsheet Products, P.O. Box 111368, Pittsburgh, PA 15238, (412) 781-1551. For more information circle number 354 on the Reader Service card.

Mouse Accounts

Mouse Budget joins Mouse Calc as the second in a series of low-cost mouse-based products from France. Mouse Budget manages your personal finances with flexible budgeting and accounting functions like income and expense summaries, credit-card and net-worth statements, tax statements, checkbook reconciliation, and more. All are easy to figure, with a mouse interface and pull-down menus in plain English. Double-entry techniques balance income and expense, but you need to enter each transaction only once. Mouse Budget requires a mouse and at least 128K of RAM. It works with the megabyte Apple //e and UniDisk 3.5, too. Mouse Budget is priced at $69.95, from International Solutions, 910 West Maude Avenue, Sunnyvale, CA 94086, (408) 773-0443. For more information circle number 352 on the Reader Service card.

To the Point

Pinpoint puts all the accessories you need into AppleWorks: a calculator, note pad, appointment calendar, communications software, envelope addresser, and "typewriter" module. A telephone dialer scans the screen for phone numbers and calls them. You can insert pictures and text into AppleWorks documents, too. The command structure is similar to that of AppleWorks, and Pinpoint works with Apple's new II RAM Expansion Card and the UniDisk 3.5. The price is $69, from Pinpoint Software (formerly Virtual Combinatics), 2823 Steinmetz Way, Oakland, CA 94602, (415) 530-1726. For more information circle number 350 on the Reader Service card.

Product Updates

● Quark has dropped the price of **Word Juggler**, its word processor, from $189 to $99. Replacement keycaps have been replaced by stick-on decals and a stand-up reference card—that's what the customer wanted. Schools can now purchase student and teacher editions at $79 and $129.

● Spinnaker Software presents four interactive video programs for children, with titles like **Reading: The Search for the Stolen Sentence**, and **Math: Add Venture of the Time Taxi**. Spinnaker chairman Bill Bowman says that education in the home is a coming thing.

● Some Spinnaker games are teaching things Spinnaker never intended: Gessler Educational Software (New York, NY, 212-673-3113) imports translations of **Snooper Troops**, **In Search of the Most Amazing Thing**, **Kids on Keys**, and **KidWriter** ($37.95 each) from France—a fun way to learn French, the way French kids do.

● Videx, makers of the **UltraTerm Video Display Card** for the Apple II, announces **AppleWorks Modifier**, a program for Apple II users who want to use AppleWorks in 80 columns—only $59.

● CIE Terminals has lowered the price of its multimode serial dot-matrix **Tri Printer** from $1995 to $1895. Buy now.

● Sorcim/IUS Micro Software—always a mouthful—has changed its name to Computer Associates Micro Products Division. Just say "**SuperCalc3a**."

● Juki Office Machines now offers four daisy-wheel printers for less than $1000, with the introduction of the **Juki 6200** at $475. Everybody's getting letter-quality.

● With the purchase of any one of its 20 educational software products, Learning Technologies (4255 LBJ, Dallas, TX 75244, 214-991-4958) will ship free of charge a new Learning Kit, with posters, lesson plans, worksheets, and class records. You could also win an Apple //c in a special Learning Technologies drawing.

● Quark has dropped the prices of its **QC10** (reviewed in "Hard-Driving Disks," September 1985, p. 25) and **QC20** hard-disk drives from $1995 to $1295, and $2295 to $1795, respectively. Maybe Quark feels price pressure from the "side"?

● "The Apple //c is not closed to anyone who owns a screwdriver," says Dan Pote of Applied Engineering. He expects to see more //c enhancements, like his company's **Z-RAM** card (see Editors' Choice, September 1985, p. 128) in the near future.

● Buy any three of the more than 50 software titles Spinnaker offers—including **Spinnaker**, **Fisher-Price**, **Telarium**, **Windham Classics**, and **Better Working Software**—and you can pick up a fourth package of your choice on the company.

● Broderbund's **Print Shop Graphics Library, Disk 2**, is ready, and it looks good—120 new designs, symbols, and pictures for **The Print Shop** for $24.95.

DIGITAL VISION

COMPUTEREYES™

VIDEO IMAGES ON YOUR COMPUTER!

Finally—an inexpensive way to capture real-world images on your computer's graphics display! COMPUTEREYES™ is an innovative slow-scan device that connects between any standard video source (video tape recorder, video camera, videodisk, etc.) and your computer. Under simple software control, a b/w image is acquired in less than six seconds. Unique multi-scan modes also provide realistic grey-scale images. Hundreds of applications!

Package includes interface module, complete easy-to-use software support on disk, owner's manual, and one year warranty all for $129.95 plus $4.00 S&H (USA).

Also available as a complete package including:
- COMPUTEREYES™
- Quality b/w video camera
- Connecting cable

for only $399.95 plus $9.00 S&H.

Demo disk available for $10.00 postpaid (refundable).

ONLY $129.95

See your dealer or order direct. Mass. residents add 5% sales tax. Mastercard, Visa accepted. To order, or for more information, write or call:

Available for:
- Apple II series
- Commodore 64/128
- Atari 800/800XL/65XE/130XE

DIGITAL VISION, INC.
14 Oak Street — Suite 2
Needham, MA 02192
(617) 444-9040, 449-7160

Circle 184 on Reader Service Card.

EXPAND APPLEWORKS™

UP TO 1 Megabyte

ON YOUR Apple II,™ II+, Franklin, or IIe

Apple II+ or compatible owners

- PLUS-WORKS™ changes your Appleworks startup disk letting you run Appleworks with all functions available from your keyboard.
- Supports all major 80 column cards.
- Not a preboot disk but a one time configuration that is not copyprotected.
- PLUS-WORKS-XM™ adds desktop memory expansion using legend, saturn or compatible ramcards up to 1024K with the 1024K legend S card. Database expansion to 4,222 records.
- PLUS-WORKS-XMP™ adds desktop expansion using the PCPI CP/M card or the ALS CP/M card with 64K ram giving you a 72K desktop.

Apple IIe owners

Don't throw your 80 column card away!

- PLUS-WORKS-XM™ will expand your desktop as well using legend or saturn ramcards.

PLUS-WORKS - $19.95 plus $3.00 ship/hand. Requires 64K Apple II+ or compat, applesoft roms, 80 col card and shift key mod.

PLUS-WORKS-XM & XMP - $49.95 plus $3.00 ship/hand. XM requires same as above with legend, saturn, or compatible ramcard or Apple IIe with ramcard. XMP requires PCPI CP/M or ALS CP/M with 64K ram.

Send check or money order to: MC/VISA add 4%

Orders only: 1-800-221-3826 • Information & N.J. residents: 516-922-9584

Norwich Data Services Ltd.
PO Box 356
E. Norwich, NY 11732-0356

NYS residents add appropriate sales tax

Dealer Inquiries Invited

Apple & Appleworks are trademarks of Apple Computer Inc.

Circle 192 on Reader Service Card.

DATAGRAM

by Matthew Lesko

A COLLECTION OF FREE OR INEXPENSIVE DATA BASES AND MONEY-SAVING TIPS FOR GOING ON-LINE.

▶ Go Irish!

Notre Dame University's Apple user group runs a bulletin board that provides assistance to faculty, staff, and students. Topics include education software, tips for using Apple products, and campus activities. A special section of the board is devoted to Macintosh and Lisa questions. Use your modem and give the board a call at (219) 239-5875.

▶ Sports Line

Join the Racket Club bulletin board for play-by-play access to major-league standings, professional-sports schedules, book reviews, trivia quizzes, jokes, and technical advice. A three-month subscription costs $15, but you can scout the board for free: Use your 300-baud modem to call (314) 725-0090 or your 1200-baud modem to call (314) 725-9555.

▶ It's Busy

Busy people don't need busy signals. Free yourself from your modem with automatic redial. This option lets your modem keep dialing the number about every 30 seconds while you go about your business.

If you're in an area not automatically set up by AT&T, find out how your telecommunications software can handle the special dialing required to take advantage of MCI and other long-distance discounters. (Some software, such as ASCOM, lets you place pauses with a series of commas, which usually gives you time to connect to your carrier before you key in your account code and data-base number.) If you don't know how to use the redial feature, contact the manufacturer, or your local user group if the data base involves public-domain software.

▶ Passport, Please

You don't need to cross the Atlantic Ocean to take a look at Conway Data's free data base of more than 230 European industrial-real-estate plants. Use your modem to call your local Telenet number, then type C 202202E and SIT. You can also call your local Tymnet number and type C ML05 and SIT. For more information, contact Conway Data at 1954 Airport Road N.E., Atlanta, GA 30341, (800) 554-5686 or (404) 458-6026.

▶ We're Compatible

If you're having trouble getting your Apple-generated file to work on another computer, such as an IBM, try using a data-base vendor as an intermediary. ITT Dialcom in Secaucus, New Jersey, and General Electric Information Services in Rockville, Maryland, are two systems that offer this service; contact your vendor to see if it has intermediary capability.

▶ Writers On Line

Delphi offers a Writers and Editors Network with access to the service's standard data bases at a substantially reduced rate—a $29.95 initiation fee versus the regular $49.95 subscription fee. The service also lets writers store, edit, transmit, download and upload manuscripts; provide typeset copy; and advertise writings. Contact Delphi, General Videotex Corporation, 3 Blackstone Street, Cambridge, MA 02139, (800) 544-4005; in Massachusetts call (617) 491-3393.

▶ Jewish Education

The Golen bulletin board deals with Judaism, Jewish education, and Jewish-oriented software. The board is operated by Rabbi Alan Rosenbaum at the Institute of Computers in Jewish Life, 845 North Michigan Avenue, Chicago, IL 60611. Use your modem to call (312) 787-7865.

▶ Write Your Congressman

For the politically minded, MCI Mail will deliver your message to every U.S. representative or senator—Republican and Democrat—for $2 per three-page letter. Obtain details from MCI Mail, 1900 M Street N.W., Washington, DC 20036, (800) MCI-2255, or (202) 833-8484 in Washington, DC.

▶ Consumer Service on a Shoestring

PLINK, a new consumer service, doesn't maintain a lot of data, but it's great for electronic mail, CB simulation, or exchanging information on many topics. The prime-time rate is $4.78 for the first three hours per month and $2.95 afterward. A $29.95 initiation fee is refundable if you're not satisfied with the system after 30 days. For more information, contact The American People/Link, 3215 North Frontage Road, #1505, Arlington Heights, IL 60004, (800) 524-0100, or (312) 870-5200 in Illinois.

▶ Calling Sci-Fi Fans

Science-fiction buffs can swap messages and information on UFONET, a Colorado-based bulletin-board system. Use your modem to call (303) 278-4244.

Breakthrough

If you aren't a diehard data-base user, check BRS's BRKTHRU—a 24-hour, menu-driven service. BRKTHRU is less expensive than BRS's normal day service, because it doesn't tack on the $8- to $27-per-hour telecommunications charge incurred with the regular service.

BRKTHRU offers evening discounts of up to $50. It isn't cheaper than BRS/AfterDark, however, which has 45 of BRKTHRU's 70 data bases with discounts of up to 80 percent off the daytime rate. BRS/AfterDark charges a $75 initiation fee and a $12 per month minimum. BRKTHRU requires only a $75 initiation fee. Contact BRS at 1200 Route 7, Latham, NY 12110, (800) 345-4277 or (518) 783-1161.

Window Shopping

Spend the day at two Washington, DC-area shopping malls through T.T.S.S., Inc.'s Homeinform System, a terminal, and a modem. Located in Tyson's Center, Virginia, and Wheaton Plaza, Maryland, T.T.S.S. claims these information centers are the only two systems of their kind anywhere.

Homeinform's data include sales, merchant and restaurant listings, help-wanted ads, theater schedules, and a calendar of events. It also lists services such as gift search, transportation, and credit-card information. Use your modem to call (703) 893-0874 at Tyson's, or (301) 933-0734 for Wheaton Plaza. For more information, contact T.T.S.S. at 1500 East Jefferson, Suite 102, Rockville, MD 20852, (301) 881-1270.

Why Pay More?

Much of the information for which on-line services charge—sometimes at rates of up to $100 an hour—you can obtain free elsewhere. You just have to be willing to wait for the organization to send you a printout. For example:

- You can access the Energy Data Base on Dialog and BRS through the U.S. Department of Energy at Oak Ridge, Tennessee, as well.
- Information concerning legislation contained in the data bases of Congressional Quarterly, Commerce Clearinghouse, and Legi-Slate is available from a free data base maintained by Congress.
- International demographics available from vendors such as I.P. Sharp, Data Resources, and Chase Econometrics are also accessible from the Bureau of the Census' free data base.
- Information regarding government grants on Control Data Corporation's system is also available at no cost from the same data base at the General Services Administration.

Which Way to the Consulting Forum?

Companies searching for computer-consulting services or consultants looking for clients can use a bulletin-board system to fill their requirements. Consultants can list their qualifications and specialties; companies can outline their computer needs. The bulletin board is up on weekdays from 12 p.m. until 8 p.m. and 2 a.m. until 8 a.m. Weekends are on an "as available" basis. Use your modem to call (215) 649-5422. Write to Brian Raub at 14 Rolling Road, Overlook Hills, PA 19151, for more information.

The Businessperson's Cliff Notes

Businesspeople must keep up with their reading, but time constraints often prevent it. ABI/Inform provides 200-word summaries of business information from more than 600 worldwide business and management publications. Topics range from computers to competitive intelligence. You can pay between $50 and $90 per hour for using the systems during the day from such vendors as VU/Text, 1211 Chestnut Street, Philadelphia, PA 19107, (800) 258-8080, or (215) 665-3300 in Pennsylvania; Information Handling Services, 15 Innverness Way East, Englewood, CO 80150, (800) 241-7824; or SDC Information Services, 2500 Colorado Avenue, Santa Monica, CA 90406, (800) 421-7229, or (800) 352-6689 in California.

You can save a bundle, though, with Innerline, Dialog's Knowledge Index, or BRS/AfterDark. Innerline's and Dialog's hourly day rates are $24 and BRS/AfterDark's rate is $15. For more information, contact Innerline at 95 West Algonquin Road, Arlington Heights, IL 60005, (800) 323-1321, in Illinois (800) 942-7835; Dialog's Knowledge Index at 3460 Hillview Avenue, Palo Alto, CA 94304, (800) 227-1927, in California (415) 858-2700; BRS/AfterDark at 1200 Route 7, Latham, NY 12110, (800) 833-4707, in New York (800) 553-5566.

Editor's note: If you can't connect with one of these data bases, it may be temporarily—or permanently—off the air. Many data bases are noncommercial ventures and can encounter financial difficulties. Feel free to contact Matthew Lesko if you continue to run into obstacles.■

Matthew Lesko is the founder and president of Information USA, Inc., a computer data-base consulting and publishing company. He is the author of seven information books—two of which made the New York Times *best-seller list. For a free copy of his newsletter on computer data bases, write to Information USA, Inc., 4701 Willard Avenue, #1707, Chevy Chase, MD 20815, or call (301) 657-1200.*

CLASSIFIEDS

Games

$2.65 ADVENTURE HINT

BOOKS. Clues, solutions, maps, trivia: Ultima III, Starcross, Deadline, Witness, Planetfall, Zork, Zork II, Zork III, Death In Caribbean, Mask of the Sun, Serpents Star, Coveted Mirror, The Quest, Expedition Amazon, Transylvania, Mystery House, Wizard & Princess, (Original) Adventure, Ulysses and Fleece, Dark Crystal. $2.65 MAP SETS: Wizardry, Knight of Diamonds, Legacy of Llylgamyn. Any title $2.65 postpaid. We also sell & consign lots of used software.

ASPEN SOFTWARE
1357 Diamond Drive, Dept. C
Prescott, AZ 86301
(602) 778-2034

ATARISOFT FOR APPLE $6 EACH

Pac-Man
Defender
Dig Dug
Donkey Kong
Robotron
Stargate
Centipede
BUY 5, GET ONE FREE
Add $2.00 shipping and handling on orders under $50.00.

ABBY'S SOFTWARE
37 South Broad St.
Fairborn, OH 45324
phone: (800) 282-0333 to order
VISA/MC

Hardware

LOWEST PRICES ON APPLE COMPATIBLES!!!

Extended 80-Col w/64K RAM Apple IIe $59.95
Disk Controller II+, IIe for 2 drives $37.95
Z-80 CP/M Card II+, IIe runs bus. prog $39.95
16K RAM Card w/cable exp. II+ to 64K $37.95
Cooling Fan w/outlet, switch II, II+, IIe $29.95
EPROM Card prog 2716/32/64 II, II+, IIe $54.95
Disk Notcher w/guide cuts square holes $5.95
Send MO/Check + $2 per item S&H. NY res. add local tax.

MICRO ACCESSORIES
PO Box 4512D
Bay Terrace, NY 11360
(718) 428-4943 9-6 pm

NEW APPLE PERIPHERALS

IIe 64K/80 Column Bd. $39. Joystick II/IIe/IIc specify $14.95. Mouse or Easy Pad Graphic Tablet w/software $49.95. Cooling Fan II/IIe $24.95. Add shipping $3. COD $2. Phone or Write for complete ill. price list.

NEXO DISTRIBUTION
8824 Golf Drive
Spring Valley, CA 92077
(619) 589-7928

MOUSETRACER

Use your Mac, IIe, or IIc mouse and draw like the pros! Put cartoons, pictures, maps, etc. on the drawing board. Strap your mouse to the Mousetracer and with your favorite graphics program trace the picture of your choice. Works like a 1:1 drafting board pantograph. Send $34.95 + $3 UPS shipping (CA res add $2.10 sales tax) to:

BRIMARK INNOVATIONS
9821 Yolanda Ave.
Northridge, CA 91324

Publications

APPLE II, II+, IIe REFERENCE

At last, everything a programmer needs all in one book! This book has been written to assist all types of programmers from those who are just starting with BASIC and lo-res graphics to those who are into hi-res graphics, animation, and sound at the machine language level. The main purpose of this reference is to make programming easier and faster by including everything from BASIC commands, instruction sets, and number systems to a complete memory map which documents each address in each page of memory. Charts are also provided for quick reference. Includes many examples for easy learning and use. Order yours today. Send check or money order for $19.95 (24.95 Cdn) to

DATAMASTER PUBLICATIONS
PO Box 7827
Saskatoon, Saskatchewan
Canada S7K 4R5

APPLYING APPLEWORKS™

Teachers/Coaches/Everyone
The first book on AppleWorks written specifically with educational uses that everyone can profit from: scoresheets, forecasting, modeling, rosters, gradebook, seating charts, budgets, etc. Go from novice level to advanced applications in step by step examples. Indexed. Send only $11.45 to

BRISTEN PRESS
PO Box 336
New Hartford, NY 13413

MICROCOMPUTER BOOKS

Computer books for the mail order market: Inside the Apple II ($17.95), Applesoft Basic Subroutines & Secrets ($15.95), Data Base Management for the Apple ($13.95), Apples for Teachers—101 Programs for the Classroom ($12.95). MC/Visa. Current DIRECTORY ($1.00).

MICRO BOOKS
PO Box 60203
Grand Junction, CO 81506
(800) 874-5280 Ext. 115 (US)
(800) 874-3426 Ext. 115 (CO)

Digitizers

COMPUTER EYES

- Make custom T-Shirts
- Print computer portraits
- Join "free" public domain ART GALLERIES
- Capture real world images
- Digitize video signals from: Video Tape Recorders (VCR's), Video Cameras, etc.
- Hundreds of practical applications

YES, I want my computer to "see"
YES, Send me ComputerEyes as follows:

Apple ComputerEyes 109.00
Software interface to:
Print Shop 12.00
Double HiRES (IIe) 12.00
Newsroom 12.00
Panasonic/Ikegami Commercial grade B/W video cameras ... 139.00
Special Hookup cabling with instructions 19.00
UNDERWARE ribbons to make custom heat iron-on transfers for T-Shirts, scarves, etc. 12.00
Color Pens 12.00

For VISA/MASTER CHARGE ORDERS, Call Toll FREE: 1-(800) 523-2445, x48 (PA Residents call 800-346-7511, x48) or Send Check/Money Order and all inquiries to:

HAL SYSTEMS
PO Box 293
Scotch Plains, NJ 07076

Please Note:
Prices include shipping & handling
One year parts and labor warranty
For COD orders, add $5.00
NJ residents add 6%
AVAILABLE for APPLE, ATARI and C-64
****Dealer Inquiries Invited****

Software

FOR IMAGEWRITER-APPLE DMP

Bold, condensed, enlarged, proportional, slashed zeros, or unidirectional at the touch of a key. Combine them too. Very fast and easy. Menu-driven software with manual. Any Apple II. WRITE-STYLE. $20 PPd.

GREEN MOUNTAIN SOFTWARE, DEPT IC
PO Box 40853
Portland, OR 97240

RECIPE MANAGEMENT

NONNIE'S FILE BOX by Ms. Nom de Plume. Your recipes entered using your word processor, recipes cross indexed, serving size adjusted, menus planned, grocery lists compiled, PLUS Nonnie's collection of tested recipes. For IIe, IIc, II+ w/lowercase. Free info or send $39.95 to

PLUME SOFTWARE INC.
Box 2209
Altoona, PA 16603

CHRISTMAS '85 - CANCELLED!

It could be—unless you or someone on your Xmas gift list can find & rescue Santa Claus and Rudolph in the delightful holiday entertainment program, A CHRISTMAS ADVENTURE. "Absolutely superb" - Roxanne F., Editor, FAMILY COMPUTING. Ideal gift for any micro-user; can be customized such that personal references to the recipient appear right in the program! $24.95 + $3.00 sh/hg. Find out why A CHRISTMAS ADVENTURE is being raved about in so many holiday-gift guides. Send $5.00 for full-disk interactive demo. Specify Apple II family or C-64. To order actual program, CALL TOLL FREE:

1-800-821-5226 EXTENSION 432

BITCARDS INC.
30 W. Service Road, Suite 122
Champlain, NY 12919

DON'T PASS™ THIS ONE

Personal Accounting Storage System. Record your personal accounting, keep history of your expenses a full year by category. Keep track of up to 9 books, print checks, keep a record of your ASSETS. Powerful set of file maintenance and report programs, i.e., NET WORTH, BUDGET ANALYSIS. Unlimited number of systems. Data is stored in standard text files. For Apple II+ w/64K, *//e*, or *//c*. $48.50 + $3.00 P&H. OH res add sales tax. MC, VISA, CHECK or MO.

BRINGARDNER DATA PRODUCTS
PO Box 24163
Columbus, OH 43224
(800) 628-2828 Ext. PASS

C + + COMPILER

For the Apple IIe, complete with macro assembler, overlay linker, screen editor, debugging tools, run-time libraries with source, dual-mode output users manual. We give you more C + + for ONLY $43.95, shipping $6.00. (AZ add 7% tax). Send check or money order to:

WSM GROUP, INC.
1161 N. El Dorado #241
Tucson, AZ 85715
(602) 298-7910

SPEEDUP HOME ACCOUNTANT

This package speeds up Home Accountant file processing 4 to 60 times, searches up to 100 times faster, speeds up garbage collection 9 times. It also allows you to switch checkbooks/types with only one keystroke, prompts you when entering split transactions, records auto. transactions multiple times during the month, PLUS MORE. DOS 3.3 Home Accountant only. VISA/MC accepted. MONEYBACK QUARANTEED if not satisfied. Only $19.00 + $2.50 shipping/handling.

SOFTWARE SOLUTIONS
5516 Merritt Circle
Edina, MN 55436
For orders only:
1-800-835-2246 Ext 131

SPEED UP CORRESPONDENCE

Not a word processor, INSTA-LETTER contains over 35 skeleton letters including thank you, collection, sympathy and more. Your own words personalize it for home and business. Uses any Apple II w/80 col & printer. Satisfaction guaranteed! WA res. add 8.1% tax. Allow 4 to 6 wk deliv. Rush $49.95 by check or MO:

WORDWEAVERS
PO Box 617
Dept 106
Kent, WA 98032

User Groups

FRANKLIN USERS GROUP

Supporting users of II, II+, FRANKLINS, and ALL COMPATIBLES. We provide a monthly newsletter, public domain library and personal attention. Membership $20 a year. Disks per box: DS/DD $13, 3M SS/DD $27. Pub Dom Samplers, $23 per 7 disk set (3M $32). Sets; Games, Eamon, CP/M, Utilities, Music, Graphics, Business.

FRANKLIN USERS GROUP INTERNATIONAL
67 E. Wind
Tecumseh, MO 65760

Supplies

DISK SALE!

SS/DD 35-trk for Apple w/sleeve & label-10/$7.60, bulk-100/$60. Standard SS/DD w/sleeve & label-10/$8.00, bulk-100/$64. DS/DD w/sleeve & label-10/$8.70, bulk-100/$74. PREMIUM QUALITY, LIFETIME WARRANTY! Money back satisfaction guarantee! Min order $20. Send check or pay by MC/VISA/AE. $3 shipping, + $2 if COD.

UNITECH
20 Hurley Street
Cambridge, MA 02141
(800) 343-0472
In Mass (617) 864-8324

BUY DIRECT AND SAVE

Z80 CP/M Card $39
Epson (Par) Print Card w/ Cable $37
Graphic Print Card w/ Cable . . . $48
80 Col Card w/ Inverse $58
Extended 80 Col w/ 64K IIe . . . $58
Eprom Writer Card $58
128K Ram Card w/ Disks, Manual $130
Super Serial w/cable, Manual . . . $80
Micro Buffer Graphic Print CD w/ 32K w/ Cable & Manual $99
Numeric Key Pad IIe $48
Send for free catalog
S&H 10% Under $100.00—5% Over $100
Hours: M - F 9:00-6:00 EST
School PO Accepted

COMPUTER SUPPLY
PO Box 164D
Valley Stream, NY 11582
516-239-1855

Utilities

APPLEWRITER™ UTILITIES

DELETE FORWARD by word/sentence. Improved cursor moves. CHANGE EMBEDDED PRINTER COMMANDS for another printer AUTOMATICALLY. Set parameters during boot. Best GLOSSARIES, loaders, hints, explanations, instructions. Specify DOS 3.3 or ProDOS. $29.50 + 1.50 S&H. Add $5.00 overseas.

LIVE OAK SOFTWARE
PO Box 14814
Baton Rouge, LA 70898-4814

New Rates Effective September 1, 1985

$150.00 Per Issue (Minimum of Three Issues)
$125.00 Per Issue (minimum of Three Issues)
For Further Information, Call or Write:

Kim Labbe
inCider Classifieds
80 Pine St.
Peterborough, NH 03458

APPLE II+ OWNERS...YOU DON'T HAVE TO BE JEWISH TO LOVE DAVKA!

For all the thousands of Apple II+ owners who've been unable to run Appleworks, Davka, the world leader in Hebrew language software, comes to the rescue with **ItWorks**. **ItWorks** is simply the best software program available that makes your II+ Appleworks compatible. Just slip **ItWorks** into the disk drive and your trusty II+ will be able to smoothly run Apple's top-rated integrated software program. **ItWorks** will run with any II+ outfitted with an 80-column board and a minimum 64k of memory. In fact, **ItWorks** enables Appleworks to work with most memory boards available for the II+--128k, 256k and more! It's available for only **$39.50** from Davka. And, as a limited-time bonus, we're selling a combination package of **ItWorks** and Appleworks for just **$229**! Make your II+ Appleworks-compatible with **ItWorks**...and you won't have to be Jewish to love Davka! To order call **1-800-621-8227**

Visa, Mastercard, and American Express accepted.

Dealer Inquiries welcome

Davka Corporation
845 N. Michigan Ave.
Suite 843
Chicago, IL 60611

Appleworks is a trademark of Apple Computer Corp.

INDEX TO ADVERTISERS

Reader Service		Page
*	Alf Products	156
199	Alpha Logic Business Systems	89
75	American Mitac	80
104	Analog Technology	152
*	Apple Computer	Insert at 32, 33
*	Applied Engineering	16, 17, 29, 73, 77, 89, 91, 107, 113, 119, 135, 154
216	AST Research	1
167	BACE	152
159	Baudville	55
179	Beagle Bros	155
35	Bible Research	85
209	Broderbund Software	25
210	Broderbund Software	43
211	Broderbund Software	79
*	Business Computers of Peterborough	93
60	Central Point Software	11
*	CH Products	CII
149	Cheatsheet Products	132
227	Checkmate Technology	98, 99
	Classified Ads	142, 143
78	Coit Valley Computers	71
*	Comb Company	86, 87
95	Companion Software	75
124	CompuServe Information Services	2, 3
166	Computer Direct	104, 105
48	Computer Friends	40
183	Computer Network	33
89	Consistent Software	116
163	Core Concepts	27
*	Covox	129
*	Curtis Manufacturing	97
*	CW Communications	117
101	Data Technology	9
144	Davka Corporation	143
184	Digital Vision	143
108	Diversified Software	90
30	Dow Jones News/ Retrieval	100
81	Eastcoast Software	89
147	Electronic Arts	95
148	Electronic Arts	31
161	Fiberbilt	42
132	First Class Peripherals	121
146	Golem Computers	92
188	Great Game Products	22
139	Gutenberg Software Ltd.	70
66	H & E Computronics	148
76	Hardcore COMPUTIST	44
229	High Order Micro	85
*	Human Systems Dynamics	34
	inCider Magazine	
	inCider Subscriptions	64
	Foreign Dealers	102
	Dealer Ad	54
	University Microfilm	94
	Christmas Sub Ad	96
	hotCider Ad	112
*	Inmac	114
114	Instant Software	128
191	Intec	85
157	International Apple Core	157
5	International Solutions	57
62	Kalglo Electronics	138
36	KWH Technology	94
93	Learning Technologies	130
28	Legend Industries	30
105	MECA	10, 11
208	Micro City	78
153	Microcomputer Games	7
*	Microsoft	115
180	Midwest Software	108
126	Mindscape	CIII
100	Nibble Notch	132
110	Northeastern Software	58, 59
192	Norwich Data Services	139
136	Olympus	30
42	Origin Systems	63
65	Orthro Information Services	CIV
31	Pacific Exchanges	152
*	PC Network	158, 159
194	Phoenix Arising	153
133	Pinpoint Publishing	12, 13
14	Pirates Harbor	72
49	Prof. Jones/ Frogg House	138
128	Programs Plus	109
186	Public Domain Software	130
234	Quadram	83
155	Quality Software	36
16	Quinsept	82
281	Quinsept	102
41	Quorum	72
165	Roger Coats	127
250	Roger Wagner Publishing	20
46	Russ Systems	76
223	Sav-Soft Products	82
84	Sensible Software	125
143	Silicon Express	123
218	Sir-Tech	39
164	South-Western Publishing	21
*	Southern California Research Group	103
99	Spectrum Holobyte	41
*	Spinnaker Software	23, 60, 61, 62, 115
150	SSI Software	45
67	Stellation II	153
160	Strategic Simulations	84
156	Sublogic	68
182	Sun Star Industries	131
221	Sweet Micro Systems	67
32	Thirdware	74
170	Tricon Industries	156
264	Utilico Microware	24
197	Value Line	111
135	Vilberg Bros Computing	94
7	Votrax	133
116	Wayne Green Int'l Ltd.	66
200	Woodbury Software	35, 82
174	Woodchuck Industries	153
169	X - 10 USA	37
190	Zoom Telephonics	40

For further information from our advertisers, please use the Reader Service card.

*This advertiser prefers to be contacted directly.

Advertising Sales: (603) 924-7138, (800) 441-4403

Paul Boule, Sales Manager; Richard Alden

Reader Service

Name _____
Title _____
Street _____
City _____ State _____
Zip _____
Telephone ( ) _____

A. How many of each issue's program listings do you actually type in?
- ☐ 1. Zero
- ☐ 2. One
- ☐ 3. Two
- ☐ 4. Three
- ☐ 5. Four
- ☐ 6. Five or more

B. Which of the following microcomputers do you own?
- ☐ 1. Apple II or II+
- ☐ 2. Apple IIe
- ☐ 3. Apple IIc
- ☐ 4. Apple III
- ☐ 5. Macintosh
- ☐ 6. Apple compatible
- ☐ 7. Other _____

C. What is your level of computing expertise?
- ☐ 1. Beginner
- ☐ 2. Intermediate
- ☐ 3. Advanced

D. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:
- ☐ 1. Editorial
- ☐ 2. The Game Room
- ☐ 3. Right of Assembly
- ☐ 4. Reviews
- ☐ 5. Data-Gram
- ☐ 6. Editors' Choice
- ☐ 7. New Products
- ☐ 8. The Applesoft Adviser
- ☐ 9. NewsLine
- ☐ 10. Ask *inCider*
- ☐ 11. Pascal Primer
- ☐ 12. Apple Clinic

E. If you are not a subscriber, please cirlce 399.

F. If you would like a one year subscription to *inCider*, please circle 400 on the Reader Service Card. Each subscription costs $24.97. (Canada & Mexico $27.97, Foreign Surface $44.97, one year only). Please allow 10–12 weeks for delivery.

Circle Numbers for more information.

1	6	11	16	21	201	206	211	216	221
2	7	12	17	22	202	207	212	217	222
3	8	13	18	23	203	208	213	218	223
4	9	14	19	24	204	209	214	219	224
5	10	15	20	25	205	210	215	220	225
26	31	36	41	46	226	231	236	241	246
27	32	37	42	47	227	232	237	242	247
28	33	38	43	48	228	233	238	243	248
29	34	39	44	49	229	234	239	244	249
30	35	40	45	50	230	235	240	245	250
51	56	61	66	71	251	256	261	266	271
52	57	62	67	72	252	257	262	267	272
53	58	63	68	73	253	258	263	268	273
54	59	64	69	74	254	259	264	269	274
55	60	65	70	75	255	260	265	270	275
76	81	86	91	96	276	281	286	291	296
77	82	87	92	97	277	282	287	292	297
78	83	88	93	98	278	283	288	293	298
79	84	89	94	99	279	284	289	294	299
80	85	90	95	100	280	285	290	295	300
101	106	111	116	121	301	306	311	316	321
102	107	112	117	122	302	307	312	317	322
103	108	113	118	123	303	308	313	318	323
104	109	114	119	124	304	309	314	319	324
105	110	115	120	125	305	310	315	320	325
126	131	136	141	146	326	331	336	341	346
127	132	137	142	147	327	332	337	342	347
128	133	138	143	148	328	333	338	343	348
129	134	139	144	149	329	334	339	344	349
130	135	140	145	150	330	335	340	345	350
151	156	161	166	171	351	356	361	366	371
152	157	162	167	172	352	357	362	367	372
153	158	163	168	173	353	358	363	368	373
154	159	164	169	174	354	359	364	369	374
155	160	165	170	175	355	360	365	370	375
176	181	186	191	196	376	381	386	391	396
177	182	187	192	197	377	382	387	392	397
178	183	188	193	198	378	383	388	393	398
179	184	189	194	199	379	384	389	394	399
180	185	190	195	200	380	385	390	395	400

Reader Service

Name _____
Title _____
Street _____
City _____ State _____
Zip _____
Telephone ( ) _____

A. How many of each issue's program listings do you actually type in?
- ☐ 1. Zero
- ☐ 2. One
- ☐ 3. Two
- ☐ 4. Three
- ☐ 5. Four
- ☐ 6. Five or more

B. Which of the following microcomputers do you own?
- ☐ 1. Apple II or II+
- ☐ 2. Apple IIe
- ☐ 3. Apple IIc
- ☐ 4. Apple III
- ☐ 5. Macintosh
- ☐ 6. Apple compatible
- ☐ 7. Other _____

C. What is your level of computing expertise?
- ☐ 1. Beginner
- ☐ 2. Intermediate
- ☐ 3. Advanced

D. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:
- ☐ 1. Editorial
- ☐ 2. The Game Room
- ☐ 3. Right of Assembly
- ☐ 4. Reviews
- ☐ 5. Data-Gram
- ☐ 6. Editors' Choice
- ☐ 7. New Products
- ☐ 8. The Applesoft Adviser
- ☐ 9. NewsLine
- ☐ 10. Ask *inCider*
- ☐ 11. Pascal Primer
- ☐ 12. Apple Clinic

E. If you are not a subscriber, please cirlce 399.

F. If you would like a one year subscription to *inCider*, please circle 400 on the Reader Service Card. Each subscription costs $24.97. (Canada & Mexico $27.97, Foreign Surface $44.97, one year only). Please allow 10–12 weeks for delivery.

Circle Numbers for more information.

1	6	11	16	21	201	206	211	216	221
2	7	12	17	22	202	207	212	217	222
3	8	13	18	23	203	208	213	218	223
4	9	14	19	24	204	209	214	219	224
5	10	15	20	25	205	210	215	220	225
26	31	36	41	46	226	231	236	241	246
27	32	37	42	47	227	232	237	242	247
28	33	38	43	48	228	233	238	243	248
29	34	39	44	49	229	234	239	244	249
30	35	40	45	50	230	235	240	245	250
51	56	61	66	71	251	256	261	266	271
52	57	62	67	72	252	257	262	267	272
53	58	63	68	73	253	258	263	268	273
54	59	64	69	74	254	259	264	269	274
55	60	65	70	75	255	260	265	270	275
76	81	86	91	96	276	281	286	291	296
77	82	87	92	97	277	282	287	292	297
78	83	88	93	98	278	283	288	293	298
79	84	89	94	99	279	284	289	294	299
80	85	90	95	100	280	285	290	295	300
101	106	111	116	121	301	306	311	316	321
102	107	112	117	122	302	307	312	317	322
103	108	113	118	123	303	308	313	318	323
104	109	114	119	124	304	309	314	319	324
105	110	115	120	125	305	310	315	320	325
126	131	136	141	146	326	331	336	341	346
127	132	137	142	147	327	332	337	342	347
128	133	138	143	148	328	333	338	343	348
129	134	139	144	149	329	334	339	344	349
130	135	140	145	150	330	335	340	345	350
151	156	161	166	171	351	356	361	366	371
152	157	162	167	172	352	357	362	367	372
153	158	163	168	173	353	358	363	368	373
154	159	164	169	174	354	359	364	369	374
155	160	165	170	175	355	360	365	370	375
176	181	186	191	196	376	381	386	391	396
177	182	187	192	197	377	382	387	392	397
178	183	188	193	198	378	383	388	393	398
179	184	189	194	199	379	384	389	394	399
180	185	190	195	200	380	385	390	395	400

1 This card valid until January 31, 1986

inCider • December 1985

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 27 Dalton, MA 01226

POSTAGE WILL BE PAID BY ADDRESSEE

inCider
P.O. Box 336
Dalton, MA 01227

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 27 Dalton, MA 01226

POSTAGE WILL BE PAID BY ADDRESSEE

inCider
P.O. Box 336
Dalton, MA 01227

GAME ROOM

by Brian J. Murphy

In Game Room, Brian Murphy reviews four to six of the most recent Apple games to hit the market. Look here for inCider*'s scoop on the latest fun.*

Game Ratings

Boffo	★ ★ ★ ★
Cut above	★ ★ ★
Mundane	★ ★
Futile	★

The Railroad Works

★ ★ ★

CBS Software
1 Fawcett Place
Greenwich, CT 06836
$34.95
Any Apple II, 48K,
one disk drive
Joystick or mouse optional

Here's an original idea—simulating model trains—a simulation of a simulation, if you will. **The Railroad Works** lets you simulate a model-train set. With the Construct routines, you can build or remove an almost unlimited amount of track (**Photo 1**). Eight icons at the bottom of the Construct screen let you lay down or remove sections of track, add various items of scenery (buildings, bushes, trees, and shipping and receiving sites), look at the entire layout (which covers 12 computer screens), or exit the routine.

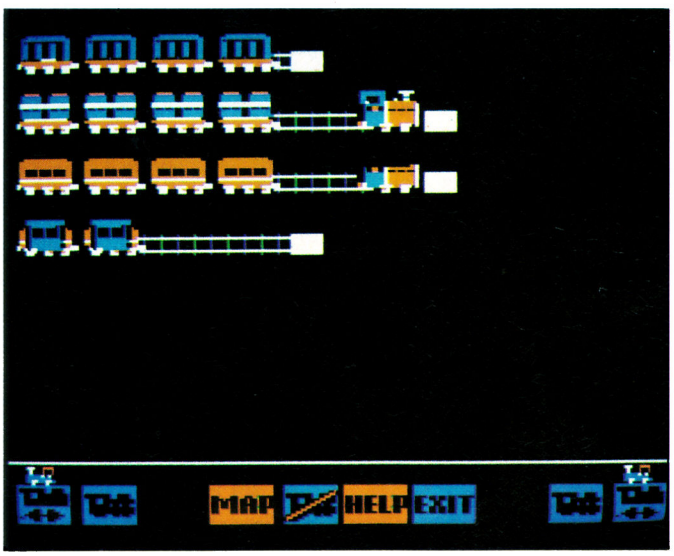


Photo 1. *Build an empire with The Railroad Works.*

When laying track, use your joystick, mouse, or keyboard to indicate the beginning and ending points of the track you're building. The track segment will appear automatically when you hit the fire button (on a joystick) or the space bar. If you want to delete any segment, select the erase icon and repeat the procedure.

Selecting the scenery icon gives you a menu of items. Move the cursor to the type of scenery desired, place a marker on the map where you want it to go, and fire (or press the space bar). You can very quickly fill all 12 sections with track, buildings, vegetation, and freight terminals. Once you have your layout the way you want it, you can exit to the main menu, select the save option, and store it on disk.

After all that work, running trains on the new track seems almost anticlimactic. The game begins by loading mid-19th-century rolling stock—steam engines with cow catchers, and so on. You can select the Change Engine and Cars option from the main menu, and you'll get mid-20th-century rolling stock and diesel engines.

Once you've picked your railroading era, link up your engine with freight cars in the marshalling yard at the top-left section of the map, and explore your railroad—the main lines, the side lines, and switches. You can run your trains in the Operate routine, for practice, or in the Play mode, in which the program scores your performance.

You earn points for staying on schedule, successfully picking up or discharging passengers and cargo, and moving cargo before it piles up to unacceptable levels (color codes at the various freight terminals tell you how much cargo is waiting). When hauling passengers, the rules are a little different. There is no end to the passengers you can pick up, and, as the manual points out, there is no penalty for not delivering them—just like the Long Island Railroad. At the end of play, the program evaluates your performance and ranks you somewhere between a coal chipper and an engineer, depending on your score.

This game seems like kid stuff because it is kid stuff. It was designed for ages 10 and up (although I suspect that if your 8-year-old were to load one of the preconstructed layouts on the game disk, he or she would have fun, too). But, as with real model trains, there'll be a certain fascination for older kids, as well—like Mom and Dad, for instance. The simulation is really accurate, once you've got your stock rolling down the line.

I have just one suggestion. If you have the money and the room (apartment dwellers are exempt from this), why not spend the money on real model trains instead? I have no argument with simulations when they re-create experiences that are too exotic, expensive, or hazardous to attempt otherwise, but toy trains don't fall into this category. I'd be willing to bet

that a single loop of track, an engine, and four or five cars will give you as much, if not more, of a thrill than this simulation, even though it's a good one. As much as we love computer games, there's a world of real experience out there, too.

Baltic 1985

★★★

Strategic Simulations
883 Stierlin Road, Building A-200
Mountain View, CA 94043
$34.95
Any Apple II, 48K,
Applesoft, one disk drive
Apple /// in emulation mode

Here's another episode in the continuing saga of World War III, as written by Roger Keating, and fought by NATO and the Warsaw Pact. In **Baltic 1985**, the improbable happens. A NATO force attempts to relieve the garrison in West Berlin. I say it's an improbable scenario because the Russian front line would probably be somewhere in suburban Amsterdam after a few days of battle.

The NATO troops include several battalions of infantry and minimal artillery support, swimming in a swelling sea of Russian tanks, Russian armored cars, Russian artillery, Russian rocket launchers—you get the picture. At the edge of the map, there's a force of NATO tanks, self-propelled howitzers, and armored infantry punching their way to the surrounded city, but will they make it in time?

They can, but only if you master the complex game system. Luckily, the master rulebook has been so thoroughly rewritten that instead of being SSI's worst player manual, it's now the company's best. It's easy to read and understand; the rules have been condensed and reorganized so that you can immediately resolve any problem or question.

Baltic is a real challenge, even for advanced wargame players. You fight this battle at the battalion and regimental level, and it requires complex tactical thinking. You have to know how to call in preparatory artillery barrages, how to use forest and town for concealment (the game simulates actual East German terrain), how to maintain air superiority over the battlefield, whom to attack, and whom to bypass. You have to keep track of air attacks, call in support fire, and monitor the strength of dozens of units, while at the same time act as a traffic cop on roads congested with reinforcements and troops racing to the battle line.

I can't resist the temptation to tell you that I won the first two games I played with Baltic 1985. That puts me in a good position to offer tips on strategy. First, keep your infantry on the defensive in Berlin. The troops will last longer that way than if they are worn down in attacks. Wait for reinforcements before you attack. Keep advancing the self-propelled guns so that they're close to the action. Use your air-support points early in every move—it's easy to forget you have them. Destroy enemy artillery and tank units first, then take on motorized infantry.

I have grown very fond of Roger Keating's World War III war games (the other two are Germany 1985 and RDF 1985). They are always realistic, challenging, and exciting—once you've mastered the system.

A final note—you can play Baltic 1985 alone, with the computer taking either the NATO or Soviet side.

Photo 2. The AL faces the NL in Micro League Baseball.

Micro League Baseball

★★★★

Micro League Sports Association
36 East Cleveland Avenue
Newark, DE 19771
Main game and manager's disks, $39.95 each
World Series and All-Star teams, $19.95
Franchise disks, $29.95 each
Any Apple II, 48K,
one disk drive

World's Greatest Baseball Game

★★

Epyx Computer Software
1043 Kiel Court
Sunnyvale, CA 94089
$39.95
Any Apple II, 64K,
one disk drive, joystick

You are in absolute control of the strategy in **Micro League Baseball** (MLB), the most advanced and detailed sport-simulation game to date for the Apple II series. MLB combines a full range of managerial decisions with superb, three-dimensional graphics, for a game that is more vividly realistic than any other baseball simulation I've seen.

The game disk has more than 20 teams from which to choose, including some of the greatest World Series teams, the "all-time" Phillies and Tigers teams (the program authors come from Philadelphia and Detroit, of course), and two wonderful clubs—the all-time American League and National League greats (**Photo 2**). For a thrill, you can match Cy Young or Walter "Big Train" Johnson against Sandy Koufax or Christy Mathewson.

Each player is designed to deliver true-to-life results. Sandy Koufax strikes out batters in batches; Reggie Jackson and Babe Ruth hit tape-measure homers. Willie Mays makes some startling catches, while Ty Cobb consistently hits the ball and burns up the base paths.

You should be able to master MLB's operation in about 15 minutes. You have four different pitches—a fastball, curve, slider, and the changeup. You can walk a batter in order to pitch to the next man. You can order a pitchout if a stolen base is coming. You can move the infield in for a double play, or just the first and third basemen to guard the corners. You can

Photo 3. The '27 Yankees are at bat in WGBG.

visit the mound to rest the pitcher or call in a relief.

When playing offense, your options are limited to swinging or bunting if no one is on base. When you have at least one man on base, though, you can call for aggressive or "safe" running, a steal, or the hit and run (assuming your batter is able to hit behind the runner). If you have only one out and a runner on third, a sacrifice bunt could score a run. Late in the game, when your pitcher comes to bat, you have a pinch-hitter option. If he reaches base, you can pull your pinch hitter and install a pinch runner.

Mastering baseball strategy could take you a lifetime. It seems as if the computer manager against whom you play never makes a mistake. So unless you're pitting a powerhouse team, like the '27 Yanks, against a much weaker club, like the '69 Mets, you won't be able to win by packing a lineup with power hitters and relying on them to hit as many runs as you need to win. You'll have to use your players and your options creatively, and, as you've seen, you have a very realistic arsenal of options at your disposal.

The hi-res color video display is the best I've seen in any home-computer baseball game. Your point of view originates where it should, from behind the plate. The use of shadow and perspective creates a convincing 3-D effect. Smooth, flicker-free animation adds to the realism—with players sliding into base, making catches, and relaying throws.

The Micro League Sports Association offers supplementary "franchise" disks for each of the 26 current major-league clubs. Each disk contains ten outstanding teams from each franchise, and an "all-time greats" team. Also available are a disk with World Series and All-Star teams and a manager's disk, which allows you to custom-build teams based on current rosters. MLB really has it all—strategy, great graphics, realism, excitement, and matches made in heaven.

On the other hand, the Epyx title, **The World's Greatest Baseball Game** (WGBG), is an example of wishful thinking, rather than accurate description. Perhaps a better title would have been "The World's Most Average Baseball Game."

WGBG is really two games. One is a challenging arcade game, and the other is a so-so "statistical" game. The arcade version, played with a joystick, gives you high, low, fast, and slow pitches, with options for knuckleballs and curveballs. When a player hits the ball, you must activate both a fielder to catch and throw the ball and the player to whom it will be thrown. Playing the arcade version requires good reflexes and split-second judgment (**Photo 3**).

The statistical game requires no arcade skills—the computer makes all plays automatically. It's far less interesting, and no match for the richly detailed MLB strategy game. You can't choose pitches, but you can call for a walk and bring the infield in. On offense, you can swing, hit and run, steal, bunt, or sacrifice.

Compare WGBG's options with MLB's and you'll know why WGBG is rated so far behind the other game. The strategy game earns nothing at all, to be honest. The rating is based solely on the merits of the arcade game.

Wishbringer

★ ★ ★

Infocom
125 Cambridge Park Drive
Cambridge, MA 02140
$39.95
Any Apple II, 48K,
one disk drive

You say you've never played a computer adventure game? Try **Wishbringer**—there's no better introduction to the richness of adventure-gaming experience than this beautiful, imaginative game.

Like all Infocom games, Wishbringer is text only, but you'll never miss the graphics. Infocom packs more color and realism into one of its text-only interactive-fiction games than you'd normally find in a dozen illustrated adventures.

In Wishbringer, you are employed at the Festeron post office, where you're given a letter to deliver to the "joke shop" over on the other side of the town. But getting there isn't easy—you'll have to find a way past a bloodthirsty poodle and the shuddery confines of a graveyard, among other things.

Returning to the village, you'll find many sinister changes. In the shadows of the night a hundred dangers lurk, including relentless secret police and a master wizard you must somehow outwit. You have one powerful weapon, the Wishbringer, a magic stone that can save you—or doom you.

First-time adventurers will find plenty of challenge as they adapt their minds to the slightly bent logic of interactive fiction. They'll also be impressed by the strong sense of atmosphere the program creates and by the accessories that come packed with the game (a map, a mysterious letter, and an enigmatic stone). I'd be willing to bet that more than a few experienced adventurers will find themselves charmed by this spellbinding game.

Now, remember your duty as a letter carrier—through rain, snow, sleet, and hail, past ogres, trolls, and demons, let nothing stop you from the swift completion of your appointed rounds.■

What do you think of today's Apple II games? Are they worth the money or the time spent playing them? Write to Brian Murphy at inCider, *80 Pine Street, Peterborough, NH 03458, and let him know your opinion.*

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™

The VERSABUSINESS™ Series

Each **VERSABUSINESS** module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

* add $3 for shipping in UPS areas
* add $4 for C.O.D. or non-UPS areas
* add $5 to CANADA or MEXICO
* add proper postage elsewhere

VISA AMERICAN EXPRESS

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. · *APPLE is a trademark of Apple Corp. · *IBM is a trademark of IBM Corp. · *OSBORNE is a trademark of Osborne Corp. *CP/M is a trademark of Digital Research · *XEROX is a trademark of Xerox Corp.

Circle 66 on Reader Service Card.

INCIDER'S 2-BIT▲▲ PROGRAMMING CONTEST:

Winners Announced!

Hundreds of you answered *inCider*'s challenge to test your programming skill and creativity by entering the 2-Bit Programming Contest we announced in the June 1985 issue (p. 116). After wading through all the responses—playing the games, watching the graphics, and trying out the utilities—Bob Ryan, our technical editor, selected what he considers the best of the two-line Applesoft programs submitted.

The Envelope, Please

First Prize—$200—goes to David Shaad of Liberal, Kansas. David's program, Two-Bit Turtle, is a turtle-graphics system in two lines of Applesoft code. Despite its simplicity, it retains the essence and educational value of Logo's full-blown turtle graphics.

Mike Oropeza of San Jose, California, wins the Second Prize of $100 for ProDATE, a ProDOS date-stamping utility. For ProDOS users who don't own a hardware clock, Mike recommends you use his utility as your ProDOS Startup program.

Third place and $50 goes to Vincent Occhipinti of Fort Worth, Texas. Vincent has created a program, Master Cataloger, that reads the directories of any number of DOS 3.3 disks and writes the file names to a text file. You can then use any word processor to print this text file, creating a master catalog of all your DOS 3.3 files and disks.

Typing in the Listings

When you enter these listings, be sure to type a question mark (?) in place of the PRINT key word, and don't use spaces except when they appear in literal strings. In addition, the Master Cataloger listing contains a number of control-D's that wouldn't normally appear in a listing, since that character is nonprintable. When you come across a control-D in the listing, don't type in CONTROL-D—rather, hold down the control key and hit the D key.

Running the Programs

Two-Bit Turtle gives you five command options—F(orward), B(ackward), T(urn), C(olor), and clear S(creen). The C command toggles the drawing color between black and white, so you can move the turtle without drawing a line, if you prefer. The S command clears the screen. The F command, followed by a number (F20, for example), moves the turtle in the direction indicated. The B command moves the turtle in the direction opposite the current heading. Change the heading by typing Tn, n being the number of degrees you want to turn the turtle.

When you run ProDATE, the program prompts you to type in the date in DD-MM-YY format. After you run the program, any file you create or save will be stamped with the proper date.

Master Cataloger presents you with a simple "?" when you run the program. It creates a master-catalog text file on the disk in drive 1, and reads the directories of disks from drive 2. At the "?" prompt, put the DOS 3.3 disk you want to include in the master catalog into drive 2. Then hit the return key or type in a name for the disk—Utilities Disk, for example. Master Cataloger then incorporates the directory of the disk in drive 2 into the master catalog. The header "Utilities Disk" will precede the disk directory when it appears in the master. When you've included all the disk directories you want, escape from the program by hitting control-reset. The master catalog is contained in a text file named V. You can then use a word processor or write a simple BASIC program to give you a hard copy of your master catalog.

Congratulations to the winners, and thanks to everyone who participated in *inCider*'s 2-Bit Programming Contest.■

Listing 1. The Winner! Two-Bit Turtle.

```
1 C = C - 2 * (C = 5): HCOLOR= C:H = H - 360 * (H > 360): VTAB 22: PRINT
  "X=";  INT (X);" Y=";  INT (Y);" HEADING ";H;" COLOR ";C;"      ": IF F = 0 THEN
  HGR : HOME :X = 139:Y = 79:C = 3:H = 0:R = - 3.1415927 / 180:F = 1:
  GOTO 1

2 INPUT A$:B$ = MID$ (A$,1,1):V = VAL ( MID$ (A$,2)):C = C + (B$ = "C"):H = H
  + (B$ = "T") * V:D = ((B$ = "F") - (B$ = "B")) * V:U = D * COS (H * R) *
  1.3:V = D * SIN (H * R):E = (X + U > 0) * (X + U < 280) * (Y + V > 0) * (Y +
  V < 160):U = E * U + X:V = E * V + Y: HPLOT X,Y TO U,V:X = U:Y = V:F = (B$
  < > "S"): GOTO 1
```

Listing 2. Second Prize! ProDATE.

```
10 PRINT : PRINT "ENTER DATE:": PRINT " DD-MM-YY": INPUT Q$:D = VAL ( LEFT$
   (Q$,2)):M = VAL ( MID$ (Q$,4,2)):Y = VAL ( RIGHT$ (Q$,2)): IF D < 1 OR M < 1 OR
   Y < 0 OR D > 31 OR M > 12 OR Y > 99 OR (M = 2 OR M = 4 OR M = 6 OR
   M = 9 OR M = 11) AND D = 31 OR D = 30 AND M = 2 OR LEN (Q$) < > 8
   THEN PRINT "ILLEGAL DATE!" CHR$ (7): GOTO 10

20 FOR N = 1 TO M: READ Q$: NEXT :Q1 = 2 * Y + (M > 7):M = M - 8 * (M >
   7):Q0 = 32 * M + D: POKE 49040,Q0: POKE 49041,Q1:D$ = STR$ (D) + "-" + Q$
   + "-" + STR$ (Y): IF Y < 10 THEN D$ = LEFT$ (D$,6 + (D > 9)) + "0" + STR$
   (Y): DATA JAN,FEB,MAR,APR,MAY,JUN,JUL,AUG,SEP,OCT,NOV,DEC
```

Listing 3. Third Prize! Master Cataloger.

```
4 PRINT "control-DOPENV,D1": ON NOT J GOTO 8:A$(0) = C$ + "":Z = PEEK (L) +
  PEEK (108) * J + 8: POKE 209, PEEK (Z): POKE 210, PEEK (Z + 1): POKE Q,0:
  POKE Q + 1,3: POKE Q + 2,18: POKE Q + 3,3: PRINT "control-D"C$: PRINT
  "control-DPR#0": PRINT "control-DIN#0": PRINT "control-DAPPENDV,D1": PRINT
  "control-DWRITEV": PRINT V$: FOR F = 1 TO 85: IF LEFT$ (A$(F),1) < > " " THEN
  PRINT A$(F);: NEXT

8 PRINT : PRINT "control-DCLOSE": FOR G = 768 TO 788: READ P: POKE G,P: NEXT :
  CLEAR : DIM A$(85):C$ = "       CATALOG,D2    ": INPUT V$:J = 256:Q = 43603:L
  = 107: FOR H = 85 TO 1 STEP - 1:A$(H) = C$ + C$: NEXT : GOTO 4:
  DATA  56,72,132,208,160,0,145,209,230,209,208,2,230,210,104,164,208,96,169,160,96
```

HINTS/TECHNIQUES

Apple users know that there's always *an easier way to get the job done. A shortcut here, an elegant twist there. That's what Hints/Techniques is all about. It's an information swap for readers who want to share their programming pointers, DOS tips, hardware secrets, AppleWorks applications, WPL enhancements, and all those other insights that make you go "Aha!" in the night. So read on and see if you don't find just the solution you've been looking for.*

Portal Update

by Brian J. Parry

Yes, I did windows. My first job for *inCider* was "Doing Windows" (February 1985, p. 54)—a windowing routine called Portal that lets you prepare programs for window displays without destroying underlying text. I wrote the routine in 40-column mode, but many people requested an 80-column version. To oblige, I wrote Portal2e.

Portal2e (**Listing 1**) is a text-windowing routine similar to Portal. You can stack up to three windows on screen simultaneously. And now, the windows can be 80 by 23 characters in size. As in the original Portal routine, the actual window interior is smaller than the specified dimensions because borders occupy space on the top, bottom, and sides of the window. The shrinkage is four spaces horizontally and two spaces vertically. A 40-by-12 window, then, will have interior scroll dimensions of 36 by 10 characters.

The New Way

To start, type in **Listing 1** and save it with:

```
BSAVE PORTAL2E OBJ,A$7C00,L$1DC
```

Before you can use the routine in your program, you must tend to setup work. Make the first line of your program:

```
10 PRINT CHR$(4)"BLOAD PORTAL2E
   OBJ,A$7C00 : HIMEM:31743: POKE
   768,0:POKE 1014,0:POKE 1015,124:
   PR#3:CALL -22447
```

This loads the routine and initializes some pointers. To open a window on the screen, use the command: &,O,le,wd,tp,ln. The O stands for "open" and le, wd, tp, and ln represent window left edge, width, top, and length, respectively. These four parameters can be any value that will create a number. See **Listing 2** for an example.

Close the Window

To close a window, use &,C—where C indicates "close." Also notice that you don't need any parameters to close a window. Remember that the routine places windows on top of each other, so if you include the statement above, the top-most window will close.

Listing 3 is a small patch, or enhancement, to the original Portal program. It lets the original Portal routine, like Portal2e, accept ampersand commands.

Enter **Listing 3**, then save it with:

```
BSAVE PORTAL PATCH OBJ,A$320,L$37
```

Make the first lines in your program:

```
10 PRINT CHR$(4)"BLOAD PORTAL
   OBJ,A$9400 : PRINT CHR$(4)
   "BLOAD PORTAL PATCH OBJ,A$320"
20 HIMEM:34815:POKE 768,0:POKE
   1014,32: POKE 1015,3
```

The command that activates the windows in Portal2e will work for the original Portal. **Listing 4** shows how to use the original Portal with the new patch. Just remember that the Portal2e routine is for 80 columns, while the Portal routine with its new patch is for 40 columns.■

Write to Brian J. Parry at 1115 West Sacramento Avenue, #39, Chico, CA 95926.

Listing 1. Portal2e.

```
7C00-  18 20 B1 00 B0 01 60 8D
7C08-  19 03 20 67 DD AD 19 03
7C10-  C9 43 F0 1F C9 4F D0 EE
7C18-  20 F5 E6 8E 01 03 20 F5
7C20-  E6 8E 02 03 20 F5 E6 8E
7C28-  03 03 20 F5 E6 8E 04 03
7C30-  4C C5 7C 20 4A FF AD 00
7C38-  03 C9 00 F0 5D CE 00 03
7C40-  20 D0 7D 20 AF 7D 18 AD
7C48-  16 03 69 04 8D 16 03 8D
7C50-  01 C0 8D 55 C0 20 AF 7D
7C58-  8D 54 C0 EE 00 03 AD 00
7C60-  03 20 D4 7D 38 AD 16 03
7C68-  8D 18 03 E9 04 8D 16 03
7C70-  18 AA A0 00 BD 09 03 99
7C78-  20 00 EC 18 03 F0 05 E8
7C80-  C8 4C 74 7C CE 00 03 AE
7C88-  00 03 BD 05 03 8D 25 00
7C90-  20 22 FC 20 3F FF 4C 51
7C98-  A8 60 20 2D FF 20 2D FF
7CA0-  20 3F FF 60 20 39 FB A2
7CA8-  00 BD BC 7C C9 AA F0 07
7CB0-  20 F0 FD E8 4C A9 7C A2
7CB8-  35 4C 12 D4 D7 C9 CE C4
7CC0-  CF D7 BA AD AA 20 4A FF
7CC8-  AD 00 03 C9 03 F0 CB AD
```

Listing 1 continued.

Listing 1 continued.

```
7CD0-  01 03 18 6D 02 03 E9 50
7CD8-  10 CA AD 02 03 38 E9 06
7CE0-  30 C2 18 AD 03 03 6D 04
7CE8-  03 E9 17 10 B7 AD 04 03
7CF0-  38 E9 03 30 AF AD 00 03
7CF8-  20 D4 7D 18 AD 03 03 6D
7D00-  04 03 8D 17 03 AE 00 03
7D08-  AD 25 00 9D 05 03 AD 16
7D10-  03 AA 18 69 04 8D 18 03
7D18-  A0 00 B9 20 00 9D 09 03
7D20-  EC 18 03 F0 05 C8 E8 4C
7D28-  1A 7D 20 D0 7D 20 8E 7D
7D30-  AD 16 03 18 69 04 8D 16
7D38-  03 8D 01 C0 8D 55 C0 20
7D40-  8E 7D 8D 54 C0 38 AD 16
7D48-  03 E9 04 8D 16 03 AD 03
7D50-  03 8D 22 00 AD 17 03 8D
7D58-  23 00 AD 02 03 8D 21 00
7D60-  AD 01 03 8D 20 00 20 80
7D68-  FE 20 58 FC CE 23 00 EE
7D70-  22 00 38 AD 21 00 E9 04
7D78-  8D 21 00 EE 20 00 EE 20
7D80-  00 20 84 FE 20 58 FC EE
7D88-  00 03 20 3F FF 60 A9 00
7D90-  85 3C 85 42 A9 CF 85 3E
7D98-  A9 04 85 3D 18 69 03 85
7DA0-  3F AD 16 03 18 69 7E 85
7DA8-  43 A0 00 20 2C FE 60 A9
7DB0-  00 85 3C 85 42 A9 CF 85
7DB8-  3E A9 04 85 43 AD 16 03
7DC0-  18 69 7E 85 3D 18 69 03
7DC8-  85 3F A0 00 20 2C FE 60
7DD0-  AD 00 03 0A 0A 0A 8D 16
7DD8-  03 60 00 00 FA
```

End of listing.

Listing 2. *Portal2e demonstration for 80 columns only.*

```
10 REM ************************************************
20 REM * PORTAL2E DEMO FOR 80 COL ONLY                 *
30 REM ************************************************
100 PR# 3: HIMEM: 31743: POKE 768,0: CALL - 22447
110 PRINT CHR$ (4)"BLOAD PORTAL 2E OBJ,A$7C00": POKE
    1014,0: POKE 1015,124
120 LIST :LE = 0:WD = 80:TP = 8: LN = 8
130 REM "O" TO OPEN WINDOW
140 & ,O,LE,WD,TP,LN: REM USING VARIABLES
150 GOSUB 500
160 & ,O,30,30,0,23: REM USING CONSTANTS
170 GOSUB 500
180 & ,O,LE + 10,WD / 2,TP - (3 * 2),8 * 2: REM USING
    EXPRESSIONS
190 GOSUB 500
200 REM "C" TO CLOSE WINDOW
210 FOR I = 1 TO 3: & ,C: GOSUB 500: NEXT
220 GOTO 130
500 LIST : LIST : RETURN
```

Listing 3. *Portal patch.*

```
0320-  18 20 B1 00 B0 01 60 8D
0328-  1B 03 20 67 DD AD 1B 03
0330-  C9 43 F0 1F C9 4F D0 EE
0338-  20 F5 E6 8E 01 03 20 F5
0340-  E6 8E 02 03 20 F5 E6 8E
0348-  03 03 20 F5 E6 8E 04 03
0350-  4C 91 94 4C 00 94 00
```

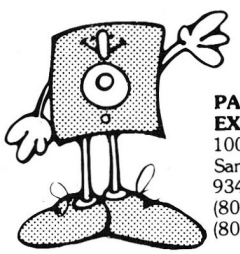
Listing 4. *Portal demonstration for 40-column text using the portal patch.*

```
10 REM ****************************
20 REM * PORTAL DEMO              *
30 REM * FOR 40 COL TEXT          *
40 REM * USING THE PORTAL         *
50 REM * PATCH                    *
60 REM *                         *
70 REM * BY BRIAN J PARRY         *
80 REM ****************************
90 REM
100 HIMEM: 34815: POKE 768,0: PRINT
    CHR$ (4)"BLOAD PORTAL OBJ,
    A$9400": PRINT CHR$ (4)"BLOAD
    PORTAL PATCH OBJ,A$320"
110 POKE 1014,32: POKE 1015,3: REM
    SET AMPERSAND VECTOR
120 TEXT : HOME
130 LE = 0:WD = 40:TP = 5:LN = 10
140 REM USE "O" TO OPEN WINDOW
150 & ,O,LE,WD,TP,LN: REM USING
    VARIABLES
160 GOSUB 500
170 & ,O,10,20,0,23: REM USING
    CONSTANTS
180 GOSUB 500
190 & ,O,2 * 3,3 * 5 + (WD / 40), TP
    - 3,LN + 4: REM USING
    EXPRESSIONS
200 GOSUB 500
210 FOR I = 1 TO 3
220 REM USE "C" TO CLOSE
    WINDOW
230 & ,C
240 GOSUB 500: NEXT : GOTO 130
500 LIST : LIST : RETURN
```

Circle 31 on Reader Service Card.

Verbatim
flexible disks

Call Free **(800) 235-4137** for prices and information. Dealer inquiries invited. C.O.D. and charge cards accepted.



VISA

PACIFIC EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA
93401. In Cal. call
(800) 592-5935 or
(805) 543-1037.

BLANKENSHIP BASIC
GIVES YOU MORE FOR YOUR MONEY!

FOR THE APPLE II+, IIe and IIc
DOS 3.3 VERSION OR PRODOS VER. $25
BOTH FOR $39.95
ADD $2.00 POSTAGE AND HANDLING
10 DAY MONEY BACK GUARANTEE

APPLE is a registerd trademark of APPLE computer inc.

1. Real interpreter, not a pre-processor
2. WHILE-ENDWHILE and REPEAT-UNTIL loops
3. True IF-THEN-ELSE-ENDIF (using WHEN)
4. PRINT and TAB commands work in HIRES
5. 80 columns supported on *IIe* and *IIc*
6. Full editor with AUTO-NUM and RENUM
7. Fast SORT, SEARCH and INSTR$ commands
8. BOX, BOXFILL, DRAW.USING and SOUND
9. Listings are indented automatically
10. DISK command replaces DOS's CHR$(4)
11. DEFINE and PERFORM named procedures
12. 99% upward compatible with Applesoft
13. All commands entered normally, no &'s
14. 100's of satisfied users world wide

MAIL CHECK TO: JOHN BLANKENSHIP,
P. O. BOX 47934, ATLANTA, GA 30362

Circle 167 on Reader Service Card.

The AT 2100 Local Area Network For APPLE II and APPLE IIe Computers with DOS 3.3

Features of the AT 2100

Collision avoidance transmission via multi-drop twisted pair.
Up to sixteen computers on the network.
Computer separation 2000 ft.
All software resident on board plug-in card.
No other software required.

With this menu driven system, you may:

- Send any type of DISK FILE to any computer on the network.
- Get any type of DISK FILE from any computer on the network.
- Read CATALOGS of any computer on the network.
- Type a MESSAGE to any computer screen on the network.
- User can protect any file from network access.

After any network operation, the receiving computer resumes as if no transmission had occurred.

PRICE $299.95

For further information write or call:
ANALOG TECHNOLOGY, INC.
27 Fort Meadow Drive
Hudson, MA 01749
(617) 568-0215

Multipage Dump

by Oswin A. Wilson

Although I've used a number of routines other Apple enthusiasts have developed, programming in assembly language has always intimidated me. Necessity, though, drove me to dabble in it—to modify T. Ogasawara's "Apple Page Dump" program, published in the January 1984 issue of *inCider* (p. 157).

The original program allows you to dump only one page of memory in two successive actions. If you want to view subsequent pages, you must reenter the command sequence at the Monitor level. If you call the routine from a BASIC program, you must set up a loop with the beginning and ending pages as its limits.

I needed a routine at the Monitor level that would dump an unspecified number of pages of memory, and require the user to press only a single key.

After studying Ogasawara's listing, attempted to make the routine recycle. This allows you to dump the next page of memory, provided the page number is incremented. Apart from the value in byte $0344, you don't have to make any alterations before address $0358, where you remove the EXIT.

After completing the first page dump, the program increments the page number stored in $FF by one and goes into a keyboard-entry routine. First, the program clears the keyboard strobe by loading zero into $C010, then checks $C000 for keyboard entry. When you press the escape key, the routine exits through $0372. Pressing the space bar makes the operation loop to $0304 if the routine has already dumped the whole page (that is, the value in $FE is zero); otherwise it loops to $0345 to dump the second portion of the current page.

For a rapid scan, hold down the space bar on the //e and //c. (On the II Plus, you must also press the repeat key at the same time.)

At $0372, the routine clears the keyboard before it exits to the Monitor level, or to the BASIC program that CALLed it.

After you modify the routine, you can still relocate it; you've added only 18 bytes to its length, for a total of 120. The same commands access the new routine: FF:pg N 300G at the Monitor level, and POKE 255,pg: CALL 768 from BASIC, if the routine is located at $0300, as assembled.

Enter the routine from the Monitor level, and save it to disk with the command BSAVE MULTIPAGE.DUMP, A$300,L$78.

Listing 5 is a printout of the routine, as disassembled by the Monitor. The **Figure** shows two pages of memory produced by this routine.

I've altered this code to ensure that it doesn't overwrite the Applesoft reset vectors, which begin at $03D0. The current version of the code finishes at $0377, for a total of 119 bytes. A more experienced assembly-language programmer should be able to improve it further. In the meantime, it performs its designated task faster than a BASIC routine—and it's also given me a sense of achievement. ■

Write to Oswin A. Wilson at 50 Poinciana Avenue, Yeppoon, Queensland 4703, Australia.

***Listing 5.** Multipage dump, as disassembled by the Apple Monitor.*

```
0300-  A0 00     LDY   #$00
0302-  84 FE     STY   $FE
0304-  A5 FF     LDA   $FF
0306-  A6 FE     LDX   $FE
0308-  20 41 F9  JSR   $F941
030B-  A9 BA     LDA   #$BA
030D-  20 ED FD  JSR   $FDED
0310-  A9 A0     LDA   #$A0
0312-  20 ED FD  JSR   $FDED
0315-  B1 FE     LDA   ($FE),Y
0317-  20 DA FD  JSR   $FDDA
031A-  C8        INY
031B-  C0 08     CPY   #$08
031D-  D0 F1     BNE   $0310
031F-  A9 A0     LDA   #$A0
0321-  20 ED FD  JSR   $FDED
0324-  A0 00     LDY   #$00
0326-  A2 00     LDX   #$00
0328-  B1 FE     LDA   ($FE),Y
032A-  C9 20     CMP   #$20
032C-  90 08     BCC   $0336
032E-  C9 A0     CMP   #$A0
0330-  B0 06     BCS   $0338
0332-  C9 80     CMP   #$80
0334-  90 02     BCC   $0338
0336-  A9 A0     LDA   #$A0
0338-  09 80     ORA   #$80
033A-  20 ED FD  JSR   $FDED
033D-  E6 FE     INC   $FE
033F-  A5 FE     LDA   $FE
0341-  C9 A0     CMP   #$A0
0343-  F0 15     BEQ   $035A
0345-  E8        INX
0346-  E0 08     CPX   #$08
0348-  D0 DE     BNE   $0328
034A-  A9 A0     LDA   #$A0
034C-  20 ED FD  JSR   $FDED
034F-  A9 8D     LDA   #$8D
0351-  20 ED FD  JSR   $FDED
0354-  A5 FE     LDA   $FE
```


Circle 104 on Reader Service Card.

Figure. Two successive pages of memory produced by the multipage dump in ***Listing 5.***

```
 FF:8 N  300G
0800: 00 19 08 0A 00 B2 20 20       2
0808: 2D 2D 20 44 4F 53 20 33 -- DOS 3
0810: 2E 33 20 48 45 4C 4C 4F .3 HELLO
0818: 00 20 08 14 00 B2 20 00       2
0820: 28 08 1E 00 89 3A BA 00 (      ::
0828: 2E 08 28 00 97 00 59 08 . (     Y
0830: 32 00 BA 22 44 4F 53 20 2 :"DOS
0838: 56 45 52 53 49 4F 4E 20 VERSION
0840: 33 2E 33 20 20 20 20 20 3.3
0848: 20 20 20 20 20 20 20 30             0
0850: 38 2F 32 35 2F 38 30 32 8/25/80"
0858: 00 8B 08 3C 00 BA 3A BA      < :::
0860: 22 41 50 50 4C 45 20 49 "APPLE I
0868: 49 20 50 4C 55 53 20 4F I PLUS O
0870: 52 20 52 4F 4D 43 41 52 R ROMCAR
0878: 44 20 20 20 53 59 53 54 D    SYST
0880: 45 4D 20 4D 41 53 54 45 EM MASTE
0888: 52 22 00 92 08 46 00 B2 R"     F 2
0890: 20 00 B4 08 50 00 B2 20      4 P 2
0898: 2D 2D 50 4F 4B 45 20 4C --POKE L
08A0: 41 4E 47 55 41 47 45 20 ANGUAGE
08A8: 43 41 52 44 20 46 49 4E CARD FIN
08B0: 44 45 52 00 05 09 5A 00 DER    Z
08B8: B9 37 36 38 2C 30 3A B9 9768,0:9
08C0: 37 36 39 2C 31 37 33 3A 769,173:
08C8: B9 37 37 30 2C 30 3A B9 9770,0:9
08D0: 37 37 31 2C 32 32 34 3A 771,224:
08D8: B9 37 37 32 2C 37 32 3A 9772,72:
08E0: B9 37 37 33 2C 31 37 33 9773,173
08E8: 3A B9 37 37 34 2C 31 32 :9774,12
08F0: 39 3A B9 37 37 35 2C 31 9:9775,1
08F8: 39 32 3A B9 37 37 36 2C 92:9776,
0900: 31 30 34 3A 00 57 09 5F 104: W _
0908: 00 B9 37 37 37 2C 37 32 9777,72
0910: 3A B9 37 37 38 2C 32 30 :9778,20
0918: 35 3A B9 37 37 39 2C 30 5:9779,0
0920: 3A B9 37 38 30 2C 32 32 :9780,22
0928: 34 3A B9 37 38 31 2C 32 4:9781,2
0930: 30 38 3A B9 37 38 32 2C 08:9782,
0938: 33 35 3A B9 37 38 33 2C 35:9783,
0940: 31 37 33 3A B9 37 38 34 173:9784
0948: 2C 31 33 31 3A B9 37 38 ,131:978
0950: 35 2C 31 39 32 3A 00 AB 5,192: +
0958: 09 64 00 B9 37 38 36 2C d 9786,
0960: 31 37 33 3A B9 37 38 37 173:9787
0968: 2C 31 33 31 3A B9 37 38 ,131:978
0970: 38 2C 31 39 32 3A B9 37 8,192:97
0978: 38 39 2C 31 36 39 3A B9 89,169:9
0980: 37 39 30 2C 31 36 35 3A 790,165:
0988: B9 37 39 31 2C 31 34 31 9791,141
0990: 3A B9 37 39 32 2C 30 3A :9792,0:
0998: B9 37 39 33 2C 32 30 38 9793,208
09A0: 3A B9 37 39 34 2C 32 30 :9794,20
09A8: 35 3A 00 FB 09 69 00 B9 5: { i 9
09B0: 37 39 35 2C 30 3A B9 37 795,0:97
09B8: 39 36 2C 32 30 38 3A B9 96,208:9
09C0: 37 39 37 2C 32 30 38 3A 797,208:
09C8: B9 37 39 38 2C 31 39 3A 9798,19:
09D0: B9 37 39 39 2C 37 34 3A 9799,74:
09D8: B9 38 30 30 2C 31 34 31 9800,141
09E0: 3A B9 38 30 31 2C 30 3A :9801,0:
09E8: B9 38 30 32 2C 32 30 38 9802,208
09F0: 3A B9 38 30 33 2C 32 30 :9803,20
09F8: 35 3A 00 4E 0A 6E 00 B9 5: N n 9
```

"COLOR" PAPER & RIBBONS

60lb Card Stock Paper, pin-feed form, micro-perforated edge
* RED * GREEN * BLUE
* GOLD * YELLOW * PINK
* WHITE * PARCHMENT
Matching Envelopes, Cordial or # 10 - Mix or Match Any Color Paper or Envelopes
[]250 sheets $15.95
[]250 envelopes $16.95
[]Jumbo 800 Pack $47.95
400 ea. Paper & Env.
*20lb Pastel Computer Paper PINK, BLUE, CANARY, GREEN, GOLD
[]400 sheets $13.95
[]Sample Pack $12.95
Add $3.00 post., $5.00 Jumbo
NJ Add 6% tax

COLOR RIBBONS & SOFTWARE * CALL

Catalog $1.00 - Free with Order
THE CREATIVE SOURCE
PO BOX 1537
TOMS RIVER, NJ 08754
201-349-6255
Money Order, Check, COD

P-tral:
BASIC to Pascal Translation Software

P-tral is the user-friendly translation software that converts Applesoft BASIC programs to Apple Pascal.

- Translates any business, scientific, graphics and game software from source.
- Translation results approach 100%.
- Translates any sized program—Large or Small.
- Essential compile directives generated.
- PIONEER version only $125.00.

REQUIREMENTS: 64/128K RAM, Dos 3.3
80-column card/Apple II, IIe, IIc
Apple Pascal 1.1 or 1.2

To order or request more information contact: **WOODCHUCK INDUSTRIES**
340 West 17th Street, New York, NY 10011
(212) 924-0576 / (212) 206-6490

Circle 174 on Reader Service Card.

ACCELERATE PFS!

Our easy to use Speedup System BOOSTS PFS 'FILE', REPORT, & GRAPH UP TO THREE TIMES FASTER. Also DOS 3.3, CP/M & PRODOS.

JUST PLUG IT IN & GO... NOW UNDER $300 !

write or call today

26 W. Mission Street PO Box 2342
Santa Barbara, CA 93120 (805) 569-3132

Circle 67 on Reader Service Card.

Picture Combine

by Carl Steadman

Hi-res graphics enhance any computer art, but drawing them is sometimes far from easy. If you want a planet framed by a background of exploding stars, for example, you may figure you have to draw the background separately from the foreground, then combine both pictures. But now you can superimpose one drawing on the other all in one shot with Picture Combine, a fast machine-language program.

For picture-perfect pictures, you simply load screens into the primary and secondary hi-res pages, then BRUN or CALL PICCOM, **Listing 6**. It's easy, but you must first make a choice. There are three statement versions, each of which differs from the others by a number, depending on whether you want to AND, OR, or EOR your picture.

The statement AND comes out as IF X=1 AND Y=1 THEN Z=1; OR turns out to be IF X=1 OR Y=1 THEN Z=1; EOR translates as IF X<>Y THEN Z=1. (X is screen 1, Y screen 2, and Z the blend.)

The 33rd number in the listing changes with AND, OR, and EOR—it's a 51, 11, or 31, depending on the number you input into the machine-language program.

Before you can type in the code, you must type CALL -151.

Type BSAVE PICCOM,A$300,L$40 to save the program. The 33rd number is at $320. The program needs pictures in both hi-res locations and will store the meld in the first page. Simply BRUN or BLOAD it and use CALL 768 to merge your drawings.

This short machine-language program should appeal to both the graphics artist and the graphics programmer. With PICCOM, good things do come in small packages.■

Listing 6. PICCOM.

```
300:AD 50 C0 AD 52 C0 AD 54 C0 AD 57 C0 A9 FF 85 18 A9 3F
                                              11
 85 19 A9 FF 85 1A A9 5F 85 1B A0 00 B1 18 51 1A 9  18
                                              31
 C6 18 C6 1A D0 EF A9 FF 85 18 85 1A C6 19 C6 1B A9 19
 C5 19 D0 DF AD 53 C0 60
```

Address correspondence to Carl Steadman at RD#1, Dent, MN 56528.

Got a hint of your own? inCider *would like to see it. If we can use it in Hints/Techniques, we'll buy it from you. Send your tip to:* inCider, *80 Pine Street, Peterborough, NH 03458.*

We Make Measurement And Control Easy!

12 BIT, 16 CHANNEL, PROGRAMMABLE GAIN A/D

- All new 1984 design incorporates the latest in state-of-art I.C. technologies.
- Complete 12 bit A/D converter, with an accuracy of 0.02%!
- 16 single ended channels (single ended means that your signals are measured against the Apple's GND.) or 8 differential channels. Most all the signals you will measure are single ended.
- 9 software programmable full scale ranges, any of the 16 channels can have any range at any time. Under program control, you can select any of the following ranges: ±10 volts, ±5V, ±2.5V, ±1.0V, ±500MV, ±250MV, ±100MV, ±50MV, or ±25MV.
- Very fast conversion (25 micro seconds).
- Analog input resistance greater than 1,000,000 ohms.
- Laser-trimmed scaling resistors.
- Low power consumption through the use of CMOS devices.
- The user connector has +12 and -12 volts on it so you can power your sensors.
- Only elementary programming is required to use the A/D.
- The entire system is on one standard size plug in card that fits neatly inside the Apple.
- System includes sample programs on disk.

PRICE $319

A few applications may include the monitoring of ● flow ● temperature ● humidity ● wind speed ● wind direction ● light intensity ● pressure ● RPM ● soil moisture and many more.

A/D & D/A

A/D & D/A Features:

- Single PC card
- 8 channels A/D
- 8 channels D/A
- Superfast conversion time
- Very easy programming
- Many analog ranges
- Manual contains sample applications

A/D SPECIFICATIONS

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

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

D/A SPECIFICATIONS

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

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

PRICE $199

SIGNAL CONDITIONER

Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are on a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

FEATURES

- 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.
- 22 pin .156 spacing edge card input connector (extra connectors are easily available i.e. Radio Shack).
- Large bread board area.
- Full detailed schematic included.

PRICE $79

I/O 32

- Provides 4, 8-Bit programmable I/O Ports
- Any of the 4 ports can be programmed as an input or an output port
- All I/O lines are TTL (0-5 volt) compatible
- Your inputs can be anything from high speed logic to simple switches
- Programming is made very easy by powerful on-board firmware
- The I/O 32 is your best choice for any control application

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

Some applications include:
Burglar alarm, direction sensing, use with relays to turn on lights, sound buzzers, start motors, control tape recorders and printers, use with digital joystick.

PRICE $89

Please see our other full page ad in this magazine for information on Applied Engineering's Timemaster Clock Card and other products for the Apple.
Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products compatible with Apple II and //e.

Applied Engineering's products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle three year warranty.

Texas Residents Add 5% Sales Tax
Add $10.00 If Outside U.S.A.

Send Check or Money Order to:
APPLIED ENGINEERING
P.O. Box 798
Carrollton, TX 75006

Call (214)241-6060
9 a.m. to 11 p.m. 7 days a week
MasterCard, Visa & C.O.D. Welcome
No extra charge for credit cards

22 unprotected disks for your Apple® II. Each under $60. Call now for a free catalog.

Summer/Fall 1985 Catalog: Dial toll free 1-800-227-3800 ext. 1607 (24 hours).

Ad Number 223 Fall 1985

EXTRA K™ NEW!

$39.95 *(Apple IIc or 128K IIe: DOS 3.3 & ProDOS)*

Put your 128K to work! Even with 128K of memory, Applesoft programs, pictures and variables only access 48K. The Extra K disk lets you utilize ALL of your 128K speed, capacity & muscle.

Extra Variables: Your Applesoft programs can function undisturbed in main memory while all variables, strings and other data reside in your extra 64K.

Extra Apple: Have TWO 64K APPLES and programs in memory and switch between them at will. You can even have a ProDOS Apple and a DOS 3.3 Apple in memory and swap files back and forth.

Extra-Fast Copies: Extra K's nibble copier copies *and verifies* unprotected disks in 35 seconds!

Extra Features: Create new "dual personality" ProDOS/3.3 disks. MANY MORE 128K UTILITIES.

Extra Screens: Store all kinds of images in memory and display any one (all or part) instantly.

Call several pictures per second to the screen!

```
10 PRINT CHR$(21): COLOR=2:
   FOR X=0 TO 39 STEP 2: FOR Y=1
   TO 47 STEP 2: Z=Z=0: PLOT
   X+Z,Y: NEXT Y,X
20 POKE 37,255
```

GOSUB 94

BEAGLE GRAPHICS

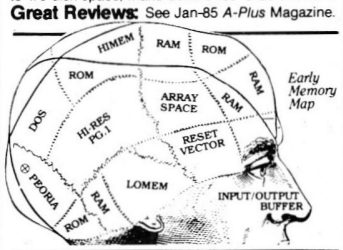
$59.95 *(Apple IIc or 128K IIe: DOS 3.3 & ProDOS)*

Double Hi-Res: Access 16 hi-res colors and 560 (horizontal) x 192 (vertical) pixels (*twice* normal resolution) on your Apple IIc or 128K Apple IIe.

For the Artist: Draw, fill and label double hi-res pictures using just the keyboard, *or* your Apple-Mouse™, joystick, Koala Pad™ or Graphics Tablet. Easy-to-use CUT & PASTE features make manipulations easy. Any image section may be re-located.

For the Programmer: 33 new commands for drawing, filling and manipulating double-res images: convert normal programs & pictures to double-res, save/load image sections, compress pix to 1/3 disk space, make double-res "slide shows"...

Great Reviews: See Jan-85 *A-Plus* Magazine.



Early Memory Map

DOUBLE-TAKE™

$34.95 *(any version of Apple II: DOS 3.3 & ProDOS)*

2-way Scrolling: Program listings and disk catalogs scroll up *and* down, making file names and program lines easier & faster to find. Machine language listings & hex-ascii dumps scroll 2 ways too.

Better List Format: Each Applesoft program statement on a new line for faster program reading.

Variable Display: Print all of a program's variables in the order used, with current values. Or alphabetize every variable and display with line numbers.

Plus: AUTO-LINE-NUMBER, improved Renumber, Hex-Dec Convert, eliminate/re-define cursor...

Beagle GAMES

I. O. SILVER™

$29.95 *(any version of Apple II)*

Hi-Res Strategy: I. O. SILVER is *both* a thinking person's strategy game and a fast-action arcade game. Excellent high-speed animation and action.

BEAGLE BAG™

$29.50 *(any version of Apple II)*

Voted by Apple software buyers to "Top-30 Most Popular" list (all categories), Beagle Bag is one of the best Apple game bargains on the market today.

PRO-BYTER™ NEW!

$34.95 *(Apple IIe/IIc or 64K II+: ProDOS)*

ByteZap Pro: All *NEW*—Inspect ProDOS and DOS 3.3 disks at the byte level. Make changes and disk/program repairs that are normally impossible.

Disk Search: Find any word or phrase on a disk or in a specified file. Repair zapped disk bytes that might cause malfunction. Instant disk maps too.

Customize Disks: Easy instructions show how to make changes to disks, programs, and DOS itself.

Machine Language Sort: One CALL in an Applesoft program will alphabetize a list of words—*super-fast!* Sorts string-arrays—*A$(1), A$(2),* etc.

Converter: Changes any Applesoft program line to machine code that can be executed with a CALL.

Text Typer: See or print ProDOS text files immediately without having to boot your word processor.

More: Put time & date of save in your catalogs. Catalog ALL directories on any ProDOS disk. Make any Applesoft command work like any other...

Machine Language Editor: Type in programs from magazines, and insert and delete at will (no mach. lang. knowledge required). 2-way-scroll memory scanner too. Very useful & educational.

Plus ALL-NEW APPLE TIPS! How to use memory like an extra disk drive, How to disable the LIST command so it says "File Locked", How to disable or swap ANY command, How to rename "Startup", How to personalize ProDOS catalogs...

GPLE™

$49.95 *(any version of Apple II: DOS 3.3 & ProDOS)*

THE Apple Program Editor: GPLE is our "Global Program Line Editor", *THE* most popular, efficient way to edit Applesoft programs. GPLE works like a word processor for Basic program lines.

Insert and Delete: Now you can quickly make changes to your programs. No more awkward "escape-editing" to make changes. No more hassles with extra spaces in quote statements. No more slow "cursor-tracing" to the end of a line.

Search and Replace: Find every occurrence of a string or variable in your programs. Or *replace* any word with any other. For example, change all X's to ABC's, or all "HORSE" strings to "COW".

Function Keys: Define your own Apple "function keys". For example, ESC-1 can Catalog drive 1, ESC-N can clear the screen and type your name and address, etc. Customize your Apple with a set of functions that perform any set of tasks you want.

D CODE™

$39.95 *(any version of Apple II: DOS 3.3 & ProDOS)*

Program Packer: D Code squeezes wasted and unused bytes out of Applesoft programs, saving valuable memory and increasing speed & efficiency.

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

Auto-Proofreader: Typing errors are caught as you type, and *before* someone runs your program. Or you can simply type "CHECK" to scan an *entire program* and uncover potential crashes.

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.*

"Live" tracing too, with each executing statement, line no. and selected variable value in a window at the bottom of screen.

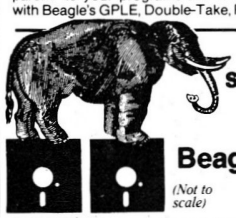
Your program runs up here.

Lines & VARIABLES traced down here.

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

Lightning-Fast Find! Find strings & variables *fast*—large programs searched in about *2 seconds!* This feature alone is worth the price of D Code.

GPLE Compatible: D Code remains "transparent" to your programs and is fully-compatible with Beagle's GPLE, Double-Take, ProntoDOS, etc.



Most software stores carry Beagle Bros disks.

(Not to scale)

PRONTO-DOS™

$29.50 *(any version of Apple II: DOS 3.3)*

Triple-speed DOS 3.3: ProntoDOS lets you load and save files at three-times normal speed. Hi-res images, for example, load in under 3 seconds.

More memory & disk space: Create high-speed bootable disks with 15 extra sectors of space. Move DOS 3.3 (if 64K) for an *extra 10K* of memory.

TYPE command: Displays text file contents.

TRIPLE-DUMP™

$39.95 *(any version of Apple II: DOS 3.3 & ProDOS)*

Print any Apple Image: 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. 40- and 80-Column text screen text.

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

Special Effects: Triple-Dump lets you select from a full range of special graphic effects: crop, rotate, magnify, compress, adjust density, etc.

GIANT BANNERS too: Print big signs and messages (8½" high letters) on ANY kind of printer.

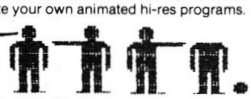
```
0 HOME
1 FOR X=1 TO 15
2 S=PEEK(49200+00000): NEXT
3 N=INT(RND(1)*5)+48
4 POKE 2075,N: POKE 2081,100-N
5 VTAB 9: LIST 1-2: GOTO 1
```

APPLE MECHANIC

$29.50 *(any version of Apple II: DOS 3.3)*

Hi-Res Shape Animation: Your drawings are converted into "shape tables" so your programs can perform animation with Apple's built-in Draw & Xdraw commands. *List and Learn* disk demos teach how to create your own animated hi-res programs.

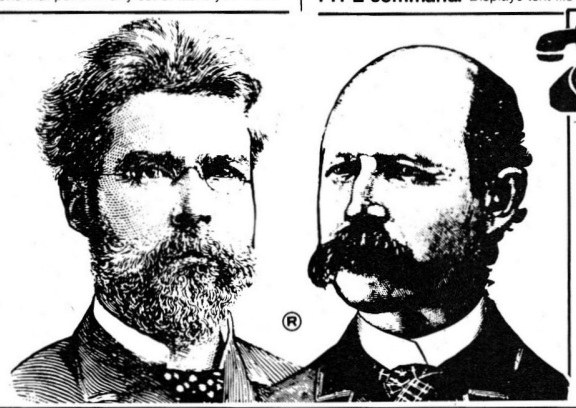
"Use Apple Mechanic routines & fonts in your programs without fee."



Hi-Res Display Type: SIX proportionally spaced hi-res screen-display fonts (both large and small) are included on the *Apple Mechanic* disk—

WESTERN: KL
apple: ABCDE
STENCIL: ABC

26 additional fonts available on our *Apple Mechanic Typefaces™* disk ($20.00).



Visa/MasterCard/COD, order Toll Free
All 50 States/24 Hours (orders only)

1-800-227-3800 x1607

Beagle Bros products are on the shelves at your local Apple Software Store.

We also ship *FAST* via First Class Mail:

☐ Alpha Plot	$39.50	☐ Fatcat	$34.95
☐ Apple Mechanic	29.50	☐ Flex Type	29.50
☐ A.M.Typefaces	20.00	☐ Frame-Up	29.50
☐ Beagle Bag	29.50	☐ GPLE	49.95
☐ Beagle Basic	34.95	☐ I. O. Silver	29.95
☐ Beagle Graphics	59.95	☐ Pro-Byter	34.95
☐ D Code	39.95	☐ ProntoDOS	29.50
☐ DiskQuik	29.50	☐ Silicon Salad	24.95
☐ DOS Boss	24.00	☐ Tip Disk#1	20.00
☐ Double-Take	34.95	☐ Triple-Dump	39.95
☐ Extra K	39.95	☐ Utility City	29.50

ADD $1.50 1ST CLASS SHIPPING (any size order).
COD add $3.00 / Calif. add 6% / Overseas add $4.00

NAME _____

ADDRESS _____

_____ ZIP _____

VISA/MCARD# _____

EXPIRATION DATE _____ VISA MasterCard

MAIL DIRECTLY TO BEAGLE BROS. We process all orders IMMEDIATELY.

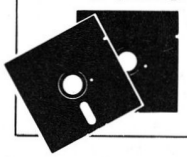
Beagle Bros MICRO SOFTWARE

The Apple Programmer's Best Friend

3990 OLD TOWN AVENUE, SUITE 102C
SAN DIEGO, CA 92110 PHONE **619-296-6400**

Circle 179 on Reader Service Card.

BULK DISKETTES
BY
NASHUA



75¢ each
Qty. 100

5¼" DS/DD with hub ring and Tyvek sleeve, bulk packaged, no labels, factory warranteed. Shipping extra. For quantity 50, add 10¢ each.

Get the same low price our high-volume duplication customers get!

CALL TOLL FREE
1-800-321-4668
in Colorado, 303-234-0871
VISA, MASTERCARD, OR COD ACCEPTED

ALF 1315-F Nelson St.
Denver, CO 80215

128 K RAM CARD

* MAY BE USED AS A RAM DRIVE.
* 128K OF RAM MEMORY (STANDARD) **$99.95**
* 80 COL BUILT IN
* FULLY APPLE COMPATIBLE
* SUPPORTS DOS 3.3 , PASCAL , PRODOS & CP/M
* ALL BOARDS ARE MADE IN U.S.A.
* WILL USE HI-RES CAPABILITIES OF REV B MOTHER BOARDS.
* APPLE IIe ONLY.

Z-80 CARD

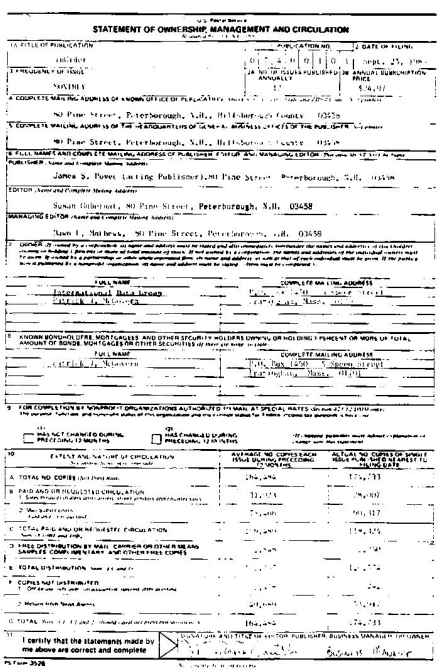
* RUNS ON APPLE II,II+,IIe OR COMPATIBLE.
* TOTALLY COMPATIBLE WITH ALL CP/M SOFTWARE
* WILL EXECUTE FULL Z-80 , 8080 & 8085 INSTRUCTION SET.
* WILL SUPPORT Z-80 INTERRUPTS.
* AN ON-BOARD ROM ELIMINATES MANY IC'S FOR COOLER OPERATION.
* FAST CLOCK: 4 MHZ
* MADE IN U.S.A. **$59.95**

SEND CHECK,CASHIERS CHECK OR MONEY ORDER TO:
TRICON INDUSTRIES INC
1403 N. MAIN ST
SANTA ANA CA 92701
714-850-4022

NO C.O.D.'S PLEASE
WHOLESALE TO THE PUBLIC

*APPLE IS A TRADEMARK OF APPLE COMPUTER CO.
**Z-80 IS A TRADEMARK OF ZILOG

Circle 170 on Reader Service Card.



STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

COMING ATTRACTIONS

- Caring for your Apple II: a complete guide to preventive maintenance by Bill O'Brien
- Do you need a numeric keypad for your //c to help you speed through calculations or AppleWorks spreadsheets? Watch for our do-it-yourself hardware project.
- Produce your own calendars with The Calendar Printer, an Applesoft program that lets you add graphics and even calculates the number of days between dates.
- In Reviews: The Other Side, a simulation game that shows that achieving peace isn't easy.
- Hints/Techniques: Handle the printed results of manipulating a series of numbers with a special BASIC print-using subroutine.

inCider

inCider magazine is published monthly by CW Communications/Peterborough, Inc. Entire contents copyright 1985 CW Communications/Peterborough, Inc. No part of this publication may be reprinted, or reproduced by any means, without prior written permission from the publisher. All programs are published for personal use only. All rights reserved.

inCider is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 53 computer publications in 24 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Asia's *The Asian Computerworld*; Australia's *Computerworld Australia, Australian Micro Computerworld, Australian PC World*, and *Directories*; Brazil's *DataNews* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Danmark* and *MicroVerden*; Finland's *Mikro*; France's *Le Monde Informatique, Golden* (Apple), and *OPC* (IBM); Germany's *Computerwoche, Microcomputerwelt, PC Welt, Software Markt, CW Edition/Seminar, Computer Business*, and *Commodore Magazine*; Italy's *Computerworld Italia*; Japan's *Computerworld Japan* and *Perso ComWorld*; Mexico's *Computerworld/Mexico* and *CompuMundo*; Netherland's *CW Benelux* and *Micro/Info*; Norway's *Computerworld Norge* and *MikroData*; Saudi Arabia's *Saudi Computerworld*; Spain's *Computerworld/Espana* and *MicroSistemas*; Sweden's *ComputerSweden, MikroDatorn, Min Hemdator*, and *Svenska PC World*; the UK's *Computer Management* and *Computer Business Europe*; the U.S.' *Computerworld, HOT CoCo, inCider, InfoWorld, MacWorld, Micro Marketworld, PC World, RUN, 73 Magazine*, and *80 Micro*.

Problems with Advertisers: Send a description of the problem and your current address to *inCider*, Route 101 and Elm Street, Peterborough, NH 03458, attn. Rita Rivard, Customer Service Manager. If urgent, call (800) 441-4403.

Problems with Subscriptions: Send a description of the problem and your current and/or most recent address to: *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Or call (800) 645-9559, (800) 732-9119 in New York, between 9 a.m. and 5 p.m. E.S.T., Monday through Friday. If you have a problem with payment, please have your mailing label and your cancelled check or credit card statement in front of you.

Change of Address: Send an old label or a copy of your old address and new address to: *inCider*, P.O. Box 911, Farmingdale, NY 11737. Please give eight weeks' advance notice.

Microfilm: This publication is available in microform from University Microfilms International. United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

Dealers: Contact Raino Wirein, Direct and Newsstand Sales Manager, *inCider*, Route 101 and Elm Street, Peterborough, NH 03458. Call (800) 343-0728.

Back Issues: Send $3.50, plus $1.00 postage for each copy to *inCider*, Back Issues Dept., Route 101 and Elm Street, Peterborough, NH 03458. For ten or more copies postage is a blanket $7.50. To order by telephone using VISA, MasterCard or American Express call (800) 258-5473 from outside New Hampshire, or 924-9471, ext. 136, within New Hampshire.

Submissions: We're always looking for first-class manuscripts at *inCider*. We'll consider publication of any material for the Apple. Guidelines for budding authors are available—just address an envelope to yourself and include it with your request. Mail manuscripts, queries, or requests for writers' guides to: *inCider* Editorial Offices, 80 Pine Street, Peterborough, NH 03458.

What you should know about the International Apple Core.

If you're like most Apple users, you don't realize the many benefits of an IAC membership. Or what it can do for you and your computer.

So what's an IAC?

International Apple Core™ is a non-profit organization of Apple users and user groups. We are dedicated to providing education, information and support to users of Apple and Apple-compatible products.

We aren't just for clubs. An individual can enjoy all the special benefits we have been providing user groups since 1979. You may share information on new applications. Or learn the latest on products. Or keep up on Apple events. Even receive specialized training.

If you'd like to join a local user group or contact other Apple enthusiasts, we can help you find them.

A membership That pays you.

As a member of IAC you nearly get paid with what you will save. By joining you will save nearly $20 on our electronic spreadsheet, *IACcalc*™. Not to mention all the other benefits only available to you as a member.

Information, please.

IAC provides many sources of information. Your $30 yearly membership fee brings a 12-issue subscription to *Nibble* magazine devoted to Apple systems and compatibles. *Nibble* features more than $50 worth of ready-to-run Apple programs in each issue. The programs focus on home, business, education and entertainment. *Nibble* also features new products, reviews, tips and techniques for learning more about your Apple and having fun doing it!

You will be eligible to receive the IAC *Disk of the Month*, a subscription to user contributed software. Each disk presents themes like games, education, or a potpourri.

Get an education.

You'll receive many educational benefits from our software programs. Our 3Pak™ series of theme packaged programs includes Educational, Financial, Games and the popular Logo. We have an Applesoft Tutorial and Education disk which is great for children.

Support for your Apple and you.

For as little as $50 annually and no deductible, you can protect your hardware, software and disks for up to $15,000.

Attach-Bios and *CP/M→SOS Converter* are ideal disks for Apple II Pascal and Apple III CP/M® application writers, vendors and users. All documentation is on the disks and no softcard is required to run Converter.

Invite your friends and save.

IAC offers user groups a special package. For $90 your group receives a full year IAC membership and a subscription to Nibble. Included are the Disks of the Month and a listing of other IAC affiliated user groups world wide.

Individually or as a group you can't lose. So fill out the membership coupon below. And don't forget to ask for our product catalog.

The companies we keep.

Here is a list of the corporations that support and sponsor the International Apple Core.

Apple Computer Inc., Cupertino, CA
Brock Software Products, Crystal Lake, IL
Burtronix, Orange, CA
Digital Research, Pacific Grove, CA
East Side Software Co., New York, NY
Educational Software Products, Glencoe, IL
Electronic Arts, San Mateo, CA
General Microcomputer, Inc., Michigan City, IN
Hayes Microcomputer, Norcross, GA
Houston Instrument Division, Austin, TX
Howard D Sams Co. Inc., Indianapolis, IN
M&R Enterprises, Santa Clara, CA
Macworld, San Francisco, CA
Multi-Tech Systems, Inc., New Brighton, MN
Nestar Systems, Inc., Palo Alto, CA
Nibble/microSPARC, Inc., Lincoln, MA
Source Telecomputing, McLean, VA
Sundex Software Corporation, Boulder, CO
Turning Point Software, Watertown, MA
Vagabondo Enterprises, Aptos, CA
Verbatim Corporation, Sunnyvale, CA

Circle 157 on Reader Service Card.

Apple, Apple II, Apple III and SOS are registered trademarks of Apple Computer, Inc.
International Apple Core is Licensed by Apple Computer, Inc. to use certain of the latter's trademarks.
IACcalc and 3Pak are trademarks of International Apple Core.
CP/M is a registered trademark of Digital Research.
Nibble is a registered trademark of microSPARC, Inc.

Membership Application

☐ $30 U.S. Individual
☐ $40 Canada & Mexico Individual
☐ $72 International Individual
☐ $90 U.S. User Group Package
☐ $152 International User Group Package

Name _____

Address _____

City _____

State/Zip _____ Country _____

All Memberships Include a 12-Month Subscription to Nibble.

Please allow 6 to 8 weeks for the delivery of your first Nibble.

☐ Payment enclosed (U.S. funds only)
☐ VISA ☐ MasterCard
☐ Please send your product catalog.

Charge Card No.
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Interbank No. ☐☐☐☐ Expiration Date ☐☐ MO ☐☐ DAY ☐☐ YEAR

Signature _____

INTERNATIONAL APPLE CORE™

Membership Dept. I-04
908 George St.
Santa Clara, CA 95054
Membership orders: 408-988-4484
General information: 408-727-7652

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-30 DAY SOFTWARE RENTALS†...

Every few months, *The NETWORK* saves its members more than $24,000,000 and processes over 100,000 orders.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns ***including some of the most important names in the computer industry:***

AT&T	*General Motors*
Barclays Bank	*Gillette*
Bell & Howell	***Hewlett Packard***
Citibank	*Hughes Aircraft*
Columbia University	***IBM***
Data General	***ITT***
Exxon	*Kodak*
Farm Bureau Insurance	***Multimate***
Frontier Airlines	*United Nations*
General Mills	*Yale University*
General Electric	*Veteran's Administration*

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and value-wise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE 1-800-621-S-A-V-E

NEW HOLIDAY HOURS
M-F 7:30 AM–9:00 PM CST
SAT 9:00 AM–7:00 PM CST

In Illinois call (312) 280-0002
Your Membership Validation Number I8Z5

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon.-Fri. 7:30 AM to 9 PM, SAT. 9AM to 7 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and rush my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT", a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

8Z5 ☐

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✓) all boxes that apply:

Basic Membership
With 14 Days Rental
- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l. per year–with 14 day rentals
- ☐ Games Software Rental Library for $10 add'l. per year

Special V.I.P. Membership*
With 30 Days Rental.
- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l. per year—with 30 day rentals

*VIP members receive advance notice on limited quantity merchandise specials

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number: _____

Exp. Date _____ mo. year

☐ Check or money order enclosed for $ _____

Name _____

Address _____ Apt. No. _____

City _____ State _____ Zip _____

Telephone ( ) _____

Please provide the following information to insure compatibility with your system (check all boxes that apply):

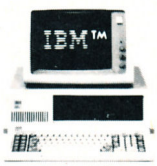
☐ APPLE //e ☐ APPLE //c ☐ APPLE //+ ☐ IBM-AT
☐ MACINTOSH ☐ LISA ☐ APPLE III ☐ IBM PC
☐ **Other:** _____

Signature _____

(Signature required to validate membership)

Copyright © 1985, PC NETWORK INC.

IBM PC HARD DISK SYSTEM



IBM PC w/256K
Floppy Drive Controller
1 Double Sided Double Density Disk Drive
Half Height 10MB Disk Subsystem

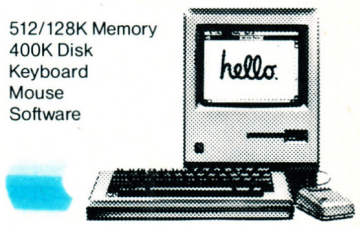
CALL FOR LATEST IBM ANNOUNCEMENTS

CUSTOM CONFIGURATIONS WELCOME

$1,749.00*

MACINTOSH SYSTEMS

512/128K Memory
400K Disk
Keyboard
Mouse
Software



Price Too Low Too Print!!!

PC NETWORK

Apple *IIc* External Disk Drive

$95.00*

APPLE 15" WIDE IMAGEWRITER with Accessory Kit

$485.00*

ACOM/MODEM *IIe*

Fully Micromodem *IIe* Compatible includes $200 worth of FREE connect time on Dow Jones & News Net

$95.00*

MONOGRAM DOLLARS AND SENSE™

for Apple *II+e*

$55.00*

DISKETTES

5¼" DS/DD	5¼" SS/DD	3½" SS/DD
Bx. 10 $8.95* Bx. 50	Bx. 10 $7.95* Bx. 50	Bx. 10
ea. .59*	ea. .47*	$21.95*
		Free Flip File Case

Guaranteed for Life!

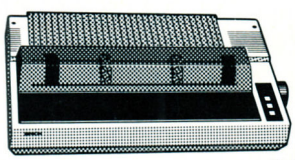
Brand name diskettes available in boxes of 10 or in bulk packs of 50

Apple *Appleworks*	$165.00*
Central Point *Copy II + Copy II MAC* Back-up Protected Software	20.00*
GTE SYLVANIA *1700 Watt* Filtered Surge Protecter	29.95*

EPSON® PRINTERS

Unbelievable Low Prices!!!

NEW MODELS NOW AVAILABLE!!



LX-80	80COL/1000CPS	$199.00*
FX-85	80COL/160CPS	299.00*
FX-185	132COL/160CPS	429.00*
LQ-1500	132COL/200CPS	799.00*

Wholesale Prices Change Rapidly...If you ever see a lower price advertised anywhere please call! You will find the Network's Price will always be the best!

PC NETWORK

...AS A PC NETWORK MEMBER ONLY!

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES!

GAMES & EDUCATIONAL SOFTWARE

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Bluechip *Barron, Millionaire or Tycon*	$ 28.25*
Broderbund *Load Runner*	19.75*
Broderbund *Choplifter*	19.00*
Broderbund *Print Shop*	28.75*
CBS *Goren-Bridge Made Easy*	45.00*
CBS *Mastering the SAT*	81.00*
CBS *Murder by The Dozen*	20.97*
Davidson & Associates *Speed Reader II*	37.97*
Davidson & Associates *Math Blaster*	29.97*
Davidson & Associates *Word Attack!*	29.97*
Epyx *Temple of Apshai*	21.97*
Hayden *DaVinci — Houses/Interiors/ or Landscapes — Mac Only*	24.75*
Hayden *Sargon III*	25.75*
Hayden *SAT Sampler Test*	11.97*
Infocom *Deadline, Suspended*	27.00*
Infocom *Enchanter, Planet Fall, Cutthroats*	20.00*
Infocom *Zork II, Zork III*	22.00*
Infocom *Zork I, Witness*	$ 20.00*
Infocom *Suspect, Infidel, Sorceror*	22.00*
Infocom *Hitchhiker's Guide, Seastalker*	20.00*
Penquin *Graphics Magician — Mac Only*	28.97*
Penquin *Transylvania Macintosh Version Only*	20.00*
Screenplay *Professional Blackjack*	39.88*
Sierra On-Line *Frogger Mac Too!*	20.00*
Sierra On-Line *Crossfire*	18.00*
Simon & Shuster *Typing Tutor III — Mac Too!*	26.25*
Sir-Tech *Wizardry*	26.97*
▶ **Spinnaker** *Alphabet Zoo, Face Maker, Kinder Comp, Hey Diddle Diddle, Rhymes & Riddles, Story Machine*	15.97*
▶ **Spinnaker** *Delta Drawing*	24.97*
Spectrum Holobyte *GATO*	18.00*
Sublogic *Night Mission Pinball*	20.00*
Sublogic *Flight Simulator II*	27.25*
Videx *MacGammon & Cribbage — Mac Only*	25.17*
Virtual Combinatics *Micro Cookbook*	21.00*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

Apple *Apple Works*	$165.00*
Assimilation Process *Mac•Tracks or Lock•It*	19.25*
ATI *How to use Multiplan*	42.00*
Borland International *Turbo Pascal*	30.00*
BPI *GL, AP, AR, PR, or INV Each Only*	205.00*
Broderbund *Bank Street Writer*	40.00*
Central Point *Copy II Plus*	20.00*
Dow Jones Software *Market Analyzer*	198.00*
Dow Jones Software *Market Manager*	103.50*
Funk Software *Sidways*	34.00*
Human Edge *Mind Prober*	24.00*
Human Edge *Management of Sales Edge*	110.00*
▶ **Living Videotext** *Think•Tank—Mac-Too!*	65.00*
▶ **Mark of the Unicorn** *Mouse Stampede*	23.97*
▶ **Microsoft** *Multiplan (DOS or CP/M)*	102.00*
▶ **Microsoft** *Word for Macintosh*	102.00*
▶ **Microsoft** *File for Macintosh*	$102.00*
▶ **Microsoft** *Multiplan for Macintosh*	102.25*
Microsoft *Basic for Macintosh*	79.00*
Microsoft *Chart for Macintosh*	66.00*
Microstuf *Crosstalk*	105.00*
Monogram *Dollars & Sense*	55.00*
Monogram *Dollars & Sense for Macintosh Version Only*	70.00*
Odesta *Helix for Macintosh Reg's 512K*	200.00*
Sensible Software *Sensible Speller IV*	67.50*
Softcraft *Fancy Fonts*	125.00*
Software Publishing *PFS: File*	68.00*
Software Publishing *PFS: Write*	68.00*
Software Publishing *PFS: Graph*	68.00*
Stoneware *DB Master Version — Mac Only*	95.00*
T/Maker *Click Art for Macintosh Version Only*	25.00*
United Software Ind. *Ascii Express Pro.*	71.50*

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh Base Systems*	CALL	
Apple *Apple IIc*	CALL	
Apple *Apple IIe*	CALL	
AT&T *6300 PC CPU2 128K/2 Floppy/1 Serial/1 Parallel*	$1,575.00*	(34.02)
AT&T *7300 Unix PC 10MB Hard Disk/1 Floppy/512K*	$3,699.00*	(79.90)
Columbia *Desktop & Portable Systems*	CALL	
COMPAQ *Desk Pro System with Tape Backup with/640K/1 Floppy/10MB Hard Disk/ 10MB Tape Drive/Monitor*	2,951.94*	(63.70)
▶ **COMPAQ** *Hard Disk Portable 256K 10MB Hard Disk/1 Floppy*	2,235.00*	(48.28)
▶ **IBM** *PC Base System 2DSDD/FDC/256K*	1,495.02*	(32.55)
▶ **IBM** *PC Professional Hard Disk 256K 1 DSDD/FDC/10MB Hard Disk*	1,749.00*	(37.78)
IBM *PC/AT Base System-1.2MB Floppy/256K*	2,795.00*	(60.37)
IBM *PC/AT All Configs*	CALL	
▶ **Sanyo** *MBC 775 Color Portable IBM Clone 2 Drives/Color Monitor/256K*	1,775.00*	(38.00)
Texas Instruments *Professional*	CALL	

DISK DRIVES & CONTROLLERS

Alps *AP-100A Dual Apple Drives in One Case*	$ 309.00*	(7.00)
Apple *All MODELS*	CALL	
Apple *Macintosh Add On Drive*	349.95*	(7.50)
Corvus *6MB Hard Disk*	1,436.00*	(31.02)
Micro-Sci *A2 143KB Drive*	165.00*	(5.00)
Micro-Sci *Floppy Controller*	55.00*	(2.50)
Paradise *10MB Hard Disk Subsystem*	969.00*	(20.93)
PC Network *Apple IIc External Drive*	95.00*	(5.00)
▶ **PC Network** *Half Height DSDD Drive — No Case*	77.50*	(2.50)
Rana *Elite I 163K Drive*	225.00*	(5.00)
Rana *Elite II 326K Drive*	320.00*	(7.00)
Rana *Elite III 652K Drive*	398.00*	(10.00)
Rana *Floppy Controller*	70.00*	(2.50)
▶ **Tandon** *TM100-2 Full Height DSDD Drive Only*	93.00*	(2.20)
▶ **Tecmar** *10MB Hard Disk for Macintosh*	999.00*	(21.58)

MEMORY CHIPS

All chips guaranteed for life.

▶ **64K Memory Upgrade Kits** *(9 chips)*	$ 5.40*	(1.00)
▶ **64K Dynamic Ram Chips** *(Each)*	.60*	(1.00)

MODEMS

▶ **Anchor** *Signalman Express*	$ 205.00*	(5.00)
Hayes *Micromodem IIe w/Smartcom*	125.00*	(2.50)
Hayes *Smartmodem 300*	125.00*	(5.00)
Hayes *Smartmodem 1200*	340.00*	(5.00)
Hayes *Smartmodem 1200B with new Smartcom II/VT 100 Emulater*	317.00*	(2.50)
Hayes *Smartmodem 2400*	535.00*	(5.00)
Novation *Apple Cat II*	174.45*	(2.50)
Prometheus *ProModem 1200*	276.00*	(6.00)
Prometheus *ProModem 1200 w/Mac Pac*	299.00*	(6.00)
▶ **Prentice** *Pop Com MAC Pack 1200 Baud Modem, Cable, Straightalk*	245.00*	(2.50)
U.S. Robotics *Password LOWEST PRICE 1200BPS MODEM!*	195.00*	(4.00)
U.S. Robotics *Courier 2400BPS Modem*	450.00*	(5.00)

MONITORS

Amdek *Video 300G Composite Monitor*	$ 110.00*	(3.00)
Amdek *Video 300A Composite Monitor*	120.00*	(3.00)
Amdek *Video 310A IBM Type Monochrome Monitor*	130.00*	(3.00)
Amdek *Color 300 Composite Color*	215.00*	(4.64)
Amdek *Color 500 RGB Color*	320.00*	(6.00)
Apple *Color 100 RGB Monitor*	430.00*	(6.00)
Princeton *HX-12 RGB Monitor*	CALL	
Samsung *12" Amber Monitor w/Cable*	85.00*	(3.00)
Samsung *Composite Color Monitor*	184.00*	(6.00)
Zenith *ZVM-123 High Res Green (Consumer Reports Rated Best Buy!!)*	76.00*	(2.50)

BOARDS AND BUFFERS

ALS *Z-Engine*	$ 115.00*	(2.50)
AST *Research Multi I/O-2 Serial/Clock*	155.00*	(2.50)
Microsoft *Premium Softcard IIe*	243.67*	(2.50)
Microtek *Dumpling/GX*	55.00*	(2.50)
Microtek *Magnum 80me 80COL + 64K*	93.00*	(2.50)
Orange Micro *Grappler +*	66.00*	(2.50)
Orange Micro *Serial Grappler*	66.00*	(2.50)
PC Network *Z80 Card*	35.00*	(2.50)
Quadram *Multicore-1Parallel/1 Serial/Clock/ Expandable to 256K*	140.00*	(2.50)
Quadram *MP-BK Microfazer Buffer (expandable)*	110.00*	(2.50)
Quadram *APIC/G Graphics Interface*	62.00*	(2.50)
Quadram *eRAM-80 80COL with 64 Memory*	88.00*	(2.50)
Street Electronics *ECHO II Speech Synthesizer*	85.00*	(2.50)
Thunderware *Thunderclock*	104.00*	(2.50)

PRINTERS

Apple *15" Imagewriter (with Mac Kit)*	$ 485.00*	(10.48)
Apple *8.5" Imagewriter (with Mac Kit)*	446.00*	(9.34)
▶ **Citizen** *MSP-10 160CPS/80COL*	280.00*	(6.05)
▶ **Citizen** *MSP-15 160CPS/132COL*	410.00*	(8.86)
▶ **Epson** *LX-80 100CPS 80COL LQ Mode*	199.00*	(4.30)
▶ **Epson** *FX-85 160CPS 80COL*	299.00*	(6.46)
▶ **Epson** *FX-185 160CPS Wide Platen*	429.00*	(9.27)
▶ **Epson** *LQ-1500 NEW LQ/DP Printer*	799.00*	(17.26)
NEC *2030 20CPS Letter Quality Printer*	605.00*	(13.00)
NEC *3530 33CPS Letter Quality Printer*	888.00*	(19.18)
NEC *8810 55CPS Printer*	1,330.00*	(28.73)
▶ **Okidata** *ML 182 New 120CPS/LQ Mode/FRICT/ Epson Graphics*	CALL	
▶ **Okidata** *Color 20 80CPS/100+ Colors/ LQ Mode/Epson Graphics/ + More (Requires Interface)*	CALL	
▶ **Okidata** *Epson Interface for Okimate Color 20*	CALL	
▶ **Okidata** *ML 192 New Sleek Design/160CPS/ LQ Mode/Fric/IBM Graphics*	CALL	
Quadram *Quadjet Multicolor Ink-Jet with Kit*	396.00*	(8.55)
Qume *Sprint 11/45 45 CPS Letter Quality*	1,155.00*	(24.40)
Qume *IBM Cable and Interface (required)*	72.00*	(1.00)
▶ **Star Micronics** *Power Type 18CPS Letter Quality*	300.00*	(6.50)
Texas Instruments *855 DP/LQ w/Tractor*	679.00*	(14.70)
Toshiba *P1340 80COL/144CPS*	499.00*	(10.78)
Toshiba *P351 New! 288CPS/132COL*	995.00*	(21.49)

ACCESSORIES AND SUPPLIES

Apple *Macintosh Carrying Case*	$69.00*	(1.49)
▶ **Assimilation Process** *Mac•Turbo•Touch*	79.00*	(2.50)
▶ **Brand Name Macintosh Diskettes** *Box of 10 Guaranteed for Life Includes free Flip & File Case*	21.95*	(1.00)
▶ **Brand Name SS/DD Diskettes** *(Box of 10)*	7.95*	(1.00)
Chalkboard *Powerpad*	62.00*	(1.50)
Hayes *Mach II Joystick for IIe*	25.00*	(1.50)
Hayes *Mach III Joystick w/Fire Button for IIe*	31.00*	(1.50)
Kensington Microwave *System Saver Fan*	56.97*	(1.50)
Koala *KoalaPad Touch Tablet*	78.00*	(1.50)
M & R *Sup-R-Mod RF Modulator*	44.00*	(1.50)
PC Network *Cooling Fan with Surge Protector & Dual Outlets*	25.00*	(2.50)
Sony *Mac Diskettes (Box of 10)*	22.95*	(1.00)
Thunderware *Thunderscan Optical Digitizer No Expensive Camera Equipment Needed!!*	155.00*	(2.50)
WP Printer Paper *2600 Sheets Microfine Perfs*	17.00*	(10.00)

Mac-Too! Indicates the Mac version is available at the same price.

***PC Network Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Wholesale prices fluctuate rapidly — all prices in this issue have been prepared 60 days in advance. Please call for latest prices. Minimum shipping $2.50 per order. International orders call for shipping & handling charges. Personal checks please allow 10 working days to clear.

***Members pay 8% above this wholesale price plus shipping.**

CALL TOLL FREE 1-800-621-S-A-V-E (orders and memberships)

In Illinois call (312) 280-0002 validation code I8Z5

...WITH THESE 15 UNIQUE BENEFITS

1 COST + 8% PRICING — The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 600 PAGE WHOLESALE CATALOG — Members receive our 600 page wholesale catalog containing over 20,000 hardware and software products for the *IBM PC, APPLE* and over 50 other popular computer systems. **THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY. NOW UPDATED QUARTERLY!**

3 IN-STOCK INSURED FAST HOME DELIVERY — The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. **EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.**

4 10 DAY RETURN POLICY — If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.

5 MEMBERSHIP SATISFACTION GUARANTEE — If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS — The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED — WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

7 FREE TECHNICAL SUPPORT — The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT — FREE!**

†8 OPTIONAL BUSINESS RENTAL LIBRARY — All members can join our BUSINESS RENTAL LIBRARY ***featuring over 1000 available titles*** for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNT PRICE FOR A 14 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 30 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY — The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS — THE PRINTOUT — Issued Quarterly at no charge to Network members only! The Printout contains all the New Product listings and price changes you need to keep your Catalog up to date. Also, we buy excess dealer inventories, and store bankruptcy closeouts, which we turn around and make available to our members at fantastic savings via *THE PRINTOUT.*

11 DISCOUNT BOOK LIBRARY — Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS — Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM — Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS — For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION — The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up *but are mostly down!!!* **THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!**

EDITORS' CHOICE

Every month, hardware and software manufacturers release dozens of new products into the Apple II market. Editors' Choice singles out one product each month that the inCider *editors feel is a significant addition to the Apple II family of products. Products evaluated in Editors' Choice are among the most recent releases and may not be available yet for retail distribution.*

This month's Editors' Choice, the new **Apple Personal Modem**, is something of a breakthrough for Apple Computer. As you would expect, the Personal Modem is a quality product. What you might not expect is the price: The Personal Modem costs only $399.

The 300/1200-baud Personal Modem lets your Apple use ordinary telephone lines to communicate with other computers. An external modem that connects to your computer via an RS-232 line, Apple's new product emulates both the older Apple modems and the Hayes Smartmodem.

You can use the Personal Modem to dial up information utilities, bulletin boards, and data-base services, as well as public or private electronic mail (e-mail) services. With the right software, the Personal Modem can also connect you to the new full-graphics information services that are now coming on line.

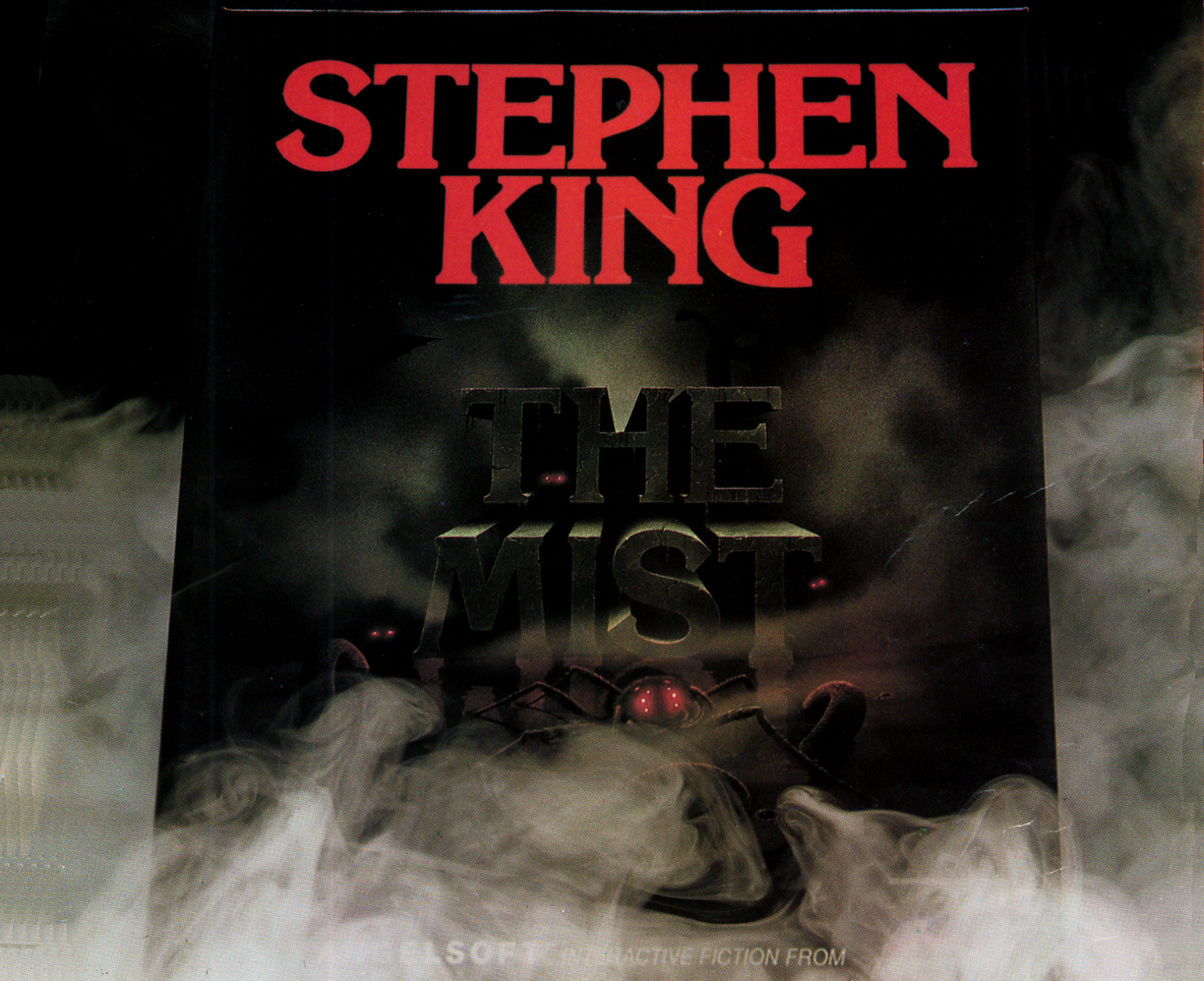
The Personal Modem makes a great first impression. Editor in Chief Susan Gubernat notes that "Apple's new modem is so compact it nearly fits into the palm of your hand. Not only its size, but also its unique installation requirements—it plugs directly into a wall outlet or a power strip—free up desk space. Apple has transformed the modem from a complex interface device into a handy telecommunications appliance."

Technical Editor Bob Ryan predicts that the Personal Modem will prove to be a dependable product. "Apple's use of very large-scale integration (VLSI) technology in the Personal Modem reduces the number of chips, and thereby increases reliability," he explains.

Review Editor Paul Statt appreciates the modem's ease of use. "You configure the modem via software," Statt says, "without having to bother with DIP switches. I used the modem to contact CompuServe, download from the *inCider* BBS (603-924-9801), and send e-mail via Tymshare. No problem."

The Apple Personal Modem is available from Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014.■

STEPHEN KING



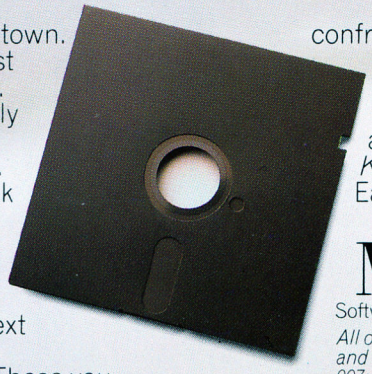
INTERACTIVE FICTION FROM

The software program you'll play with all the lights on.

The setting is a quiet New England town. Or is it? Because when a mysterious mist descends upon it, anything can happen.

An enormous, bloodthirsty dragonfly removes heads with a snap. A mutant centipede attacks with razor-sharp legs. A giant presence paralyzes with the shriek of a curfew whistle from hell.

This could only be Stephen King's *The Mist.*™ Although it's based on the novella of the same name, you can't turn to the last page in this frightening text adventure from Mindscape.™



Your commands control the action. Those you confront along the way react to your every move.

Journey to your software dealer for Stephen King's *The Mist.*™ And while you're there, ask for Mindscape's™ other new text adventures: *James Bond 007: A View To A Kill,*™ *Forbidden Castle*™ and *Voodoo Island.*™ Each one is delightfully terrifying.

Even with the lights on.

Mindscape

Software that challenges the mind.

MINDSCAPE INC

All of these text adventures are available for the Apple® II series and IBM PC® and PC jr. Stephen King's The Mist and James Bond 007: A View To A Kill are also available for the Macintosh.™

Mindscape, Inc. 3444 Dundee Road, Northbrook, Illinois 60062 1-800-221-9884. (In Illinois 1-800-942-7315)

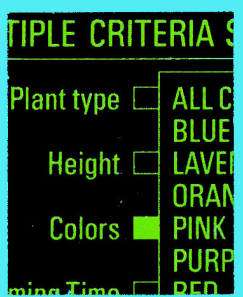
Apple, Macintosh and IBM are registered trademarks of Apple Computer, Inc., and International Business Machines. Mindscape is a trademark of Mindscape, Inc.

Circle 126 on Reader Service Card.

NOW YOU CAN PUT YOUR APPLE™ TO WORK IN YOUR GARDEN.

THE PERFECT PACKAGE FOR APPLE COMPUTER OWNERS WHO ARE GARDENERS...AND FOR GARDENERS WHO ARE APPLE COMPUTER OWNERS!

Introducing Computerized Gardening from ORTHO – the first and only personalized gardening program available on computer software. It works by detailing plant and shrubs by user zip codes to provide an individualized gardening and landscaping program. Planting requirements are listed according to shade or sun-loving plants, blooming or non-blooming plants, watering needs and plant color and others.



You'll find the software available for IBM, Apple II and Commodore Computers.

Plus, included in the package is a copy of the new ORTHO Book *Gardening Techniques* – an authoritative "how-to" that shows you in color and detail page after page of gardening procedure.

The ORTHO Computerized Gardening Package is available at software outlets, bookstores and lawn and garden centers where ORTHO books are sold.

Just $49.95

For more information write:
ORTHO Information Services
575 Market Street, San Francisco, CA 94105

ORTHO INFORMATION SERVICES

Apple™ is a trademark of Apple Computer, Inc.

Circle 65 on Reader Service Card