



THE INDEPENDENT GUIDE
FOR **apple** COMPUTING

VOLUME 2
NEW SECTION ON MACINTOSH
ISSUE 5
MAY 1984
\$2.95

▶ GETTING
THE MOST
OUT OF
YOUR APPLE

- ▶ DISK-DRIVE
COMPARISON
FOR THE APPLE II
- ▶ ACCELERATING
YOUR APPLE II
- ▶ WRITING
WITH THE
MACINTOSH
- ▶ CHOOSING A
HARD DISK
- ▶ GOLDEN'S
APPLES
- ▶ THE MAC
ACCORDING
TO HOGAN
- ▶ REVIEWS:
VIZ-A-CON &
VIZ-A-MERGE
SMART CABLE
GRAPHICS
MAGICIAN
- ▶ MACPAINT
MAGIC

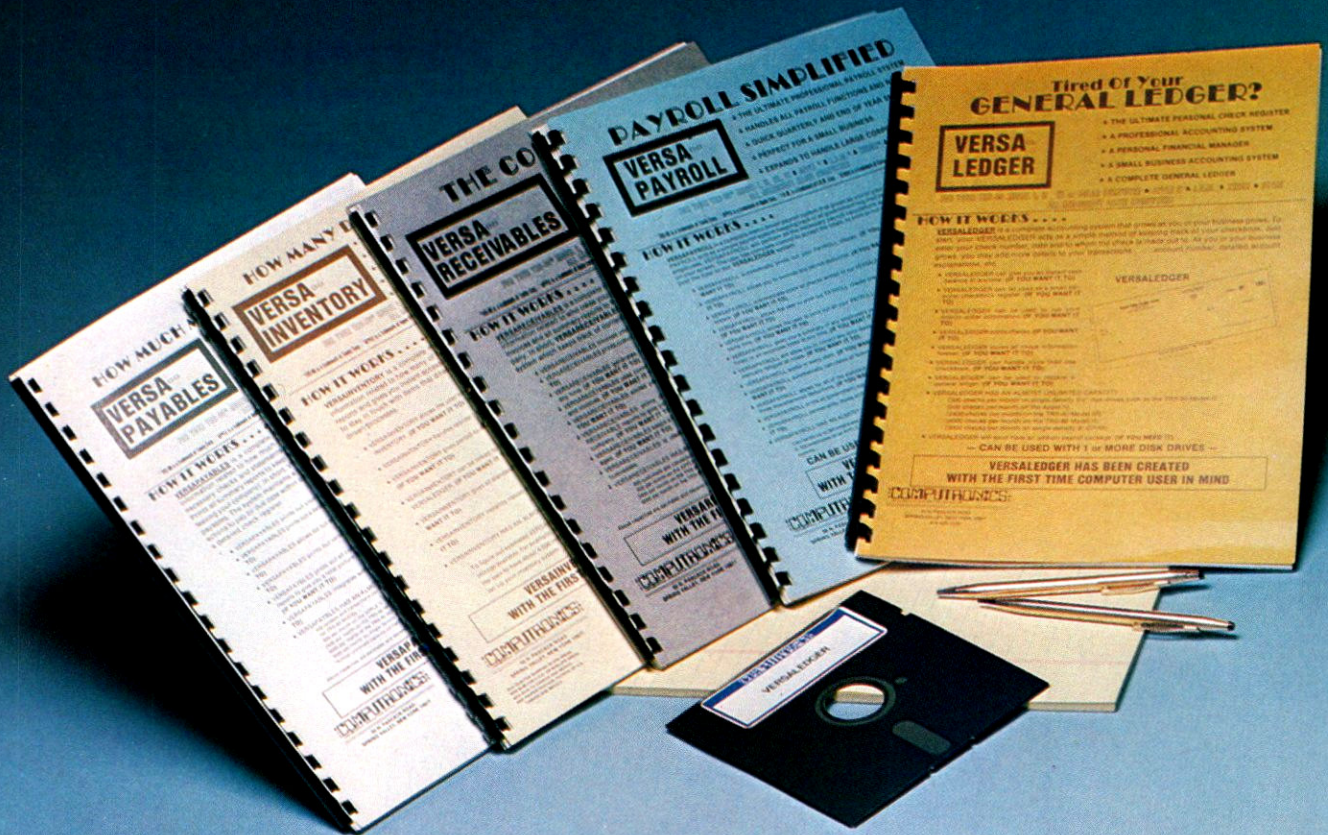


*****3-DIGIT 371
#GAS0116S091 8#680488 8H

DR KENNETH BUCHHOLZ
WWW.APPLE2ONLINE.COM

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 developed 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

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS!

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.

CONTENTS



THE INDEPENDENT
GUIDE FOR
APPLE COMPUTING

MASS STORAGE

29 MACHINE
LANGUAGE

By Steve Rosenthal
A short glossary of mass
memory storage

34 THE INS AND
OUTS OF HARD DISKS

By Alan Roszkiewicz
Freedom from disk-swapping
may now be within your
reach.

40 THE WORLD OF
DISK DRIVES

By Charlie Allen
An array of choices awaits
you.

46 DISKS IN RAM'S
CLOTHING

By Alan Roszkiewicz
Solid-state floppy-disk-drive
emulators

48 ACCELERATING
YOUR APPLE

By Steven Marks
The right peripherals can do
the job.

HARDWARE REVIEW

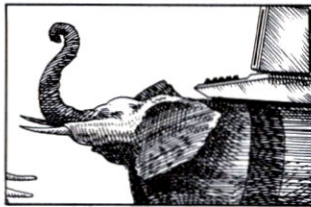
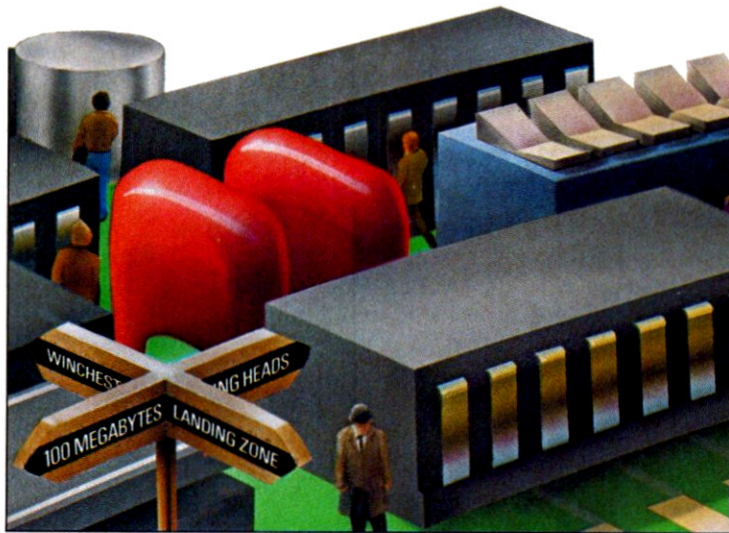
55 THE SMART
CABLE

By Alan Roszkiewicz
A cable for all reasons

SOFTWARE REVIEWS

58 THE GRAPHICS
MAGICIAN

By Russ Lockwood
This programming aid helps
game-software sorcerers
conjure up picturesque
graphics.



63 VIZ-A-CON AND
VIZ-A-MERGE

By W. Charles Doherty
Now you can combine a
series of spreadsheets into a
single summary and move
information from one
spreadsheet to another.

**HARDWARE/
SOFTWARE REVIEW**

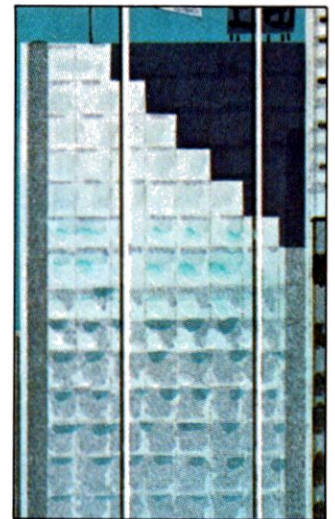
69 POINTING A
FINGER AT MUSIC

By Chris Albertson
A winning combination yields
a big sound at a small cost.

**TELECOM-
MUNICATIONS**

104 ELECTRONIC
ORACLE

By Russ Lockwood
The Delphi
telecommunications service
provides a wide range of
information,
communications, and
entertainment.



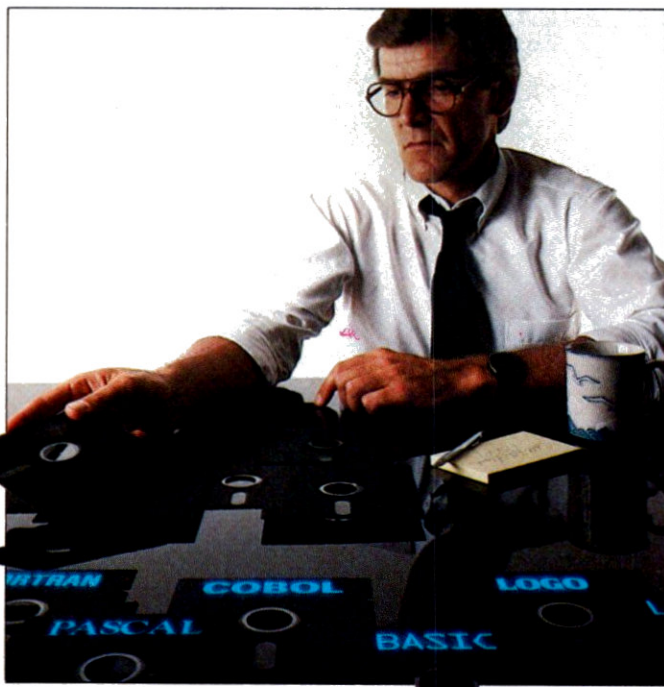
APPLES AT WORK

114 GOLDEN'S
APPLES ARE BECOMING
DELICIOUS

By A. Richard Immel
Morley Golden has a firm
grip on his construction
company because he has
learned to use micros to his
advantage.

MARKETPLACE

143 INTRODUCING
A+ DISK MAGAZINE
A collection of ready-to-run
programs and documentation
for Apple computers makes
its debut.



PDQ II PUTS "32 BIT" 68000 COPROCESSOR POWER IN YOUR APPLE II

PRODUCTIVITY INCREASE

PDQ II will make your Apple II or IIe outperform itself. It will fly through tasks which used to take hours. It will perform multiple tasks at the same time. Most Apple software programs will exhibit a 200 to 2,000 percent increase in speed, without reprogramming.

NEXT GENERATION CAPABILITIES

That's not all—when you plug a PDQ II into your Apple, it will provide the advanced features of the 16/32 bit MC68000 microprocessor. Your Apple will be capable of utilizing sophisticated, "next generation" software products.

ONE SIMPLE SOLUTION

PDQ II eliminates the need for numerous add-ons — it includes an integrated high speed pseudo-disk, printer/communications buffer, memory extension capability and a powerful 16/32 bit processor. PDQ II consists of two system boards which simply plug inside your Apple, making your Micro think it's a Mini.

PDQ II SYSTEM SPECIFICATIONS

Standard Features

- Microprocessor
 - 16/32 bit MC68000
 - 10 MHz
- User Memory
 - 256K Bytes RAM
- Integrated Functionality
 - Multiple printer/communications buffering
 - Pseudo-disk operations
 - Track buffering (p-System)
- ETC Software
 - ETC MC68000 Assembler
 - ETC MC68000 System Monitor
 - ETC p-System (version IV) to Apple DOS Interface Utility
- Languages and Software Systems Supported
 - Applesoft BASIC Compatibility & Speed up
 - Apple DOS 3.3
 - UCSD p-System (version IV) Interpreter—executes UCSD Pascal, FORTRAN-77 and BASIC P-Code
 - UCSD Pascal (**Now Included!**)

INSURANCE FOR THE FUTURE

PDQ II provides a powerful p-System run time environment, making it possible for your Apple to take advantage of many of the hundreds of high-quality p-System applications...the same applications available for Digital, IBM, HP, and other computers.

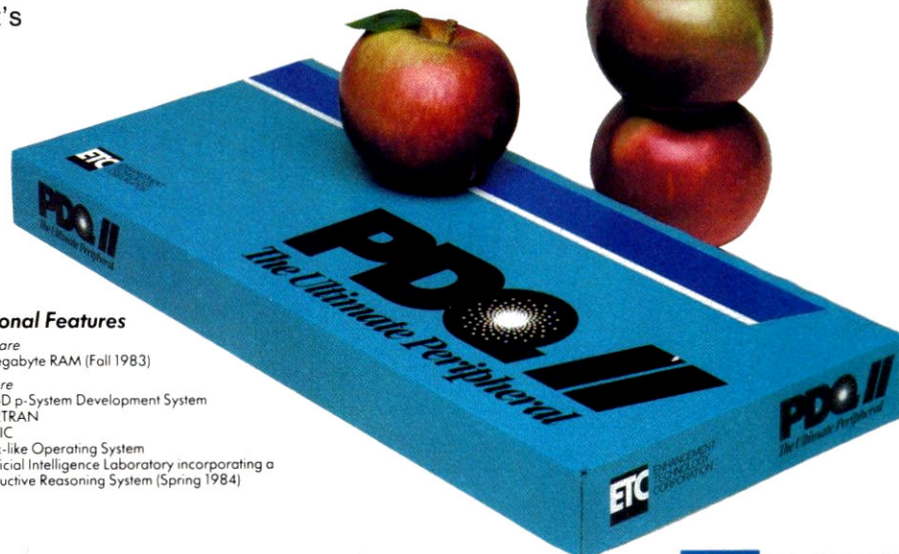
PDQ II technology makes your current investment in software and training more productive, while providing an almost unlimited growth path.

PDQ II comes with a full one year warranty and will be available through your local Apple dealer

If you simply cannot wait, send your check or M.O. for \$1290 (postage included) to: Enhancement Technology Corporation, P.O. Box 1267, Pittsfield, MA 01202. Mass residents must include 5% sales tax.

**NOW AVAILABLE FOR \$795
(WITHOUT UCSD p-SYSTEM AND PASCAL)**

PDQ II
The Ultimate Peripheral



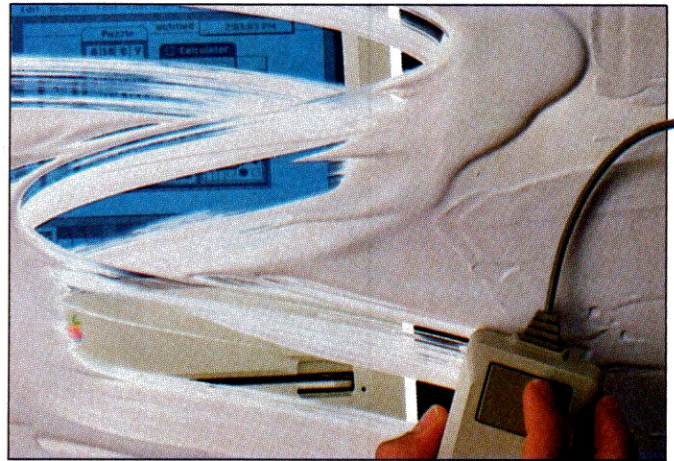
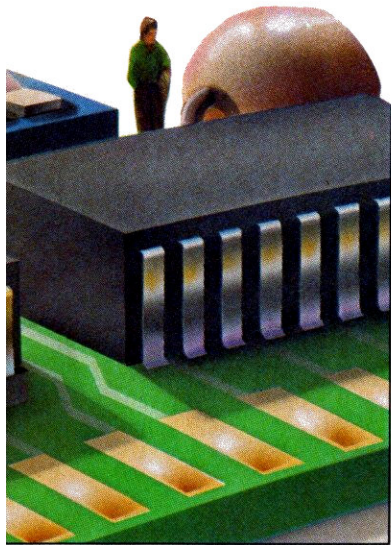
Optional Features

- Hardware
 - 1 Megabyte RAM (Fall 1983)
- Software
 - UCSD p-System Development System
 - FORTRAN
 - BASIC
 - Unix-like Operating System
 - Artificial Intelligence Laboratory incorporating a Deductive Reasoning System (Spring 1984)

Apple II and Apple IIe are registered trademarks of Apple Computer, Inc. UCSD p-System is a registered trademark of the Regents of the University of California. Digital is a registered trademark of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corporation. Osborne is a registered trademark of Osborne Computer Corporation.

ETC ENHANCEMENT
TECHNOLOGY
CORPORATION

CIRCLE 173 ON READER SERVICE CARD



▶ **LANGUAGES**

144 PICKING A PROGRAMMING LANGUAGE

By Susan R. Woliner
Are you becoming a programmer? Here's some background information that will help you choose a language.

151

Program Contest

▶ **TUTORIAL**

153 HOW TO dBASE II

By Robert Cowart
Part VII in a tutorial series on dBase II

▶ **DEPARTMENTS**

9 EDITORIAL

11 LETTERS

14 DISPATCHES
By Vanessa Schnatmeier

17 THOUGHTWARE

By Steve Rosenthal
Mass memory storage for the Apple II family of computers

123 ELECTRONIC BRAINSTORMING

By John Unger Zussman
The Apple/IBM Difference

129 THAT'S ENTERTAINMENT

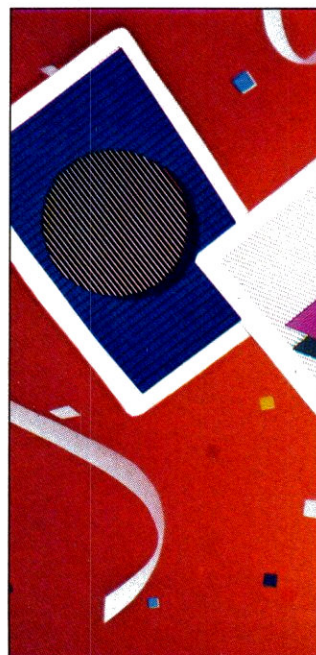
161 NEWS+

By Frederic E. Davis
Your inside source for developments and trends in the personal-computer industry

167 RESCUE SQUAD

By Lindsay McGrath and Ken Boorum

170 PRODUCT NEWS



▶ **THE MACINTOSH AND LISA**

▶ **EDITORIAL**

80 By Maggie Canon
Welcome to a new monthly section covering Apple's 32-bit line of products.

▶ **THE MAC AT WORK**

84 EXECUTIVE MEMO WRITER
By Frederic E. Davis
Using MacWrite in the office

▶ **COMMUNICATIONS**

89 THE MAGICPHONE
By Frederic E. Davis
A desktop space saver

94 MACTEP
By Dennis Brothers and Steve Rosenthal
Teaching your Macintosh to communicate

▶ **MACGALLERY**

100 MACPAINT MAGIC
By Adele Aldridge

▶ **THE MAC ACCORDING TO HOGAN**

90 CLIP, CLIP, SNIP, SNIP
By Thom Hogan
Scrapbook and clip art

▶ **THE MAC IN EDUCATION**

96 SENDING THE MAC TO COLLEGE
By Vanessa Schnatmeier
At the 24 universities in the Apple University Consortium, students, faculty, and staff will be able to buy Macintoshes at a greatly reduced rate.

▶ **PIPELINE**

99 EARLY REPORTS FROM THE FIELD
By Steve Rosenthal
OAC and Softcon show coverage

▶ **PRODUCT NEWS**

102
A listing of the latest new software, hardware, and accessories

Start A Tradition With Advanced Ideas™

Bring the whole family together with programs that are educational, flexible, extendable and *fun*. As the years go by you'll be glad you did.

Families like yours know programs aren't all the same. And that a computer is only as good as the software that runs on it.

So go ahead. Demand programs flexible enough to fit your children's abilities as they grow. Insist on features that extend subject matter as far as you want to take it. And be unimpressed if the whole thing isn't great fun. Then watch as your family keeps coming back to Advanced Ideas. You'll discover that you've really started something.

How to Choose Software for Your Home

"As an educator with over a decade of experience using computers with children, I've found there are key features in a well-designed learning game. One is *extendability*.

Look for enough variety to hold your child's attention over time. Some games are appealing in the short run, but are quickly mastered. Supplementary materials such as disks of added lessons can continue your child's interest and enjoyment.

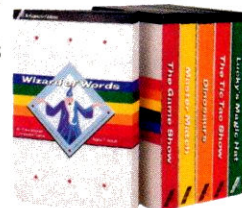
The ability to modify a program is another form of extendability. Authoring systems can let you create lessons on your own topic areas for any age level and allow children to create and save original work, giving a sense of completion and pride vital to learning."

Software of Choice

Advanced Ideas (formerly Computer-Advanced Ideas) leads the industry with programs designed for extendability through easy-to-use authoring systems and a unique library of LearningWare™ diskettes. Rich game play and sound educational design have won Advanced Ideas programs the approval of the National Education Association.

Ask to see a demonstration at your local computer store.

Then make Advanced Ideas a tradition in your home.



**Advanced Ideas™**
Bringing Ideas Home

2550 Ninth Street Suite 104 Berkeley, CA 94710
(415) 526-9100

Advanced Ideas programs are compatible with the most popular computers: Apple,® IBM® and Commodore.™
Apple is a registered trademark of Apple Computers, Inc. IBM is a registered trademark of IBM Corp. Commodore is a trademark of Commodore Business Machines, Inc.

Geoff Zawolkow
Vice President, Product Development
Advanced Ideas

CIRCLE 108 ON READER SERVICE CARD



Publisher
Sydney H. Rogers
Editor
Maggie Canon
Technical Editor
Frederic E. Davis
Senior Copy Editor
Eva Langfeldt
Managing Editor
Leslie Steere
Senior Staff Editor
Jane Willson
Assistant Editor
Ruth Ramberg
Office Manager
Marjorie Gae Brandon
Editorial Assistant
Candace De Santis
Consulting Editor
Steve Rosenthal
Contributing Editors
Ellen Thro, Chris Albertson,
Robert Cowart, John Zussman, Freff,
Vanessa Schnatmeier, Lindsay McGrath,
Alan Roszkiewicz
Art Director
Peter A. Tucker
Associate Art Director
Fabian Cooperman
Art Assistants
Ilisa Goodheartz, Sandra Ray, Tom Stvan

Advertising Manager Ted M. Welch
Advertising Coordinator Jo Ann Nocella
Mid-West Advertising Manager Thomas Lutzke
West Coast Manager Deanna D'Zamba
East Coast Manager Suzanne M. Zellner
Account Representatives EAST COAST Annie G. Freeman
MID-WEST Kathryn J. Cumberlander
WEST COAST Thomas E. Richardson,
Cindy M. Silverman

Subscription Direction Chet Klimuszko
Telemarketing Manager Linda Rossiter
New Business Manager Eric A. Bernhard
Renewal and Billing Manager Shane Boel
Retail Sales Manager Gerald Grossman

Advertising Office
Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016, (212) 725-7947

Cover: Craig Calsbeek
Photos: Dick Belcher (pp. 144-145); Tom Keller (pp. 40-41)
Illustrations: George Abe (p. 191); Craig Calsbeek (pp. 34-35, 59); Art Curtis (p. 123); Alan Daniels (pp. 48-49, 114-115); Catherine Kanner (pp. 14-15); Doug Paulin (p. 17); Donna Tarzian (p. 167)

CONSUMER COMPUTERS & ELECTRONICS MAGAZINE DIVISION
President Larry Sporn
Vice President Marketing J. Scott Briggs
Vice President Circulation Carole Mandel
Vice President General Manager Eileen G. Markowitz
Vice President, Licensing and Special Projects Jerry Schneider
Creative Director Peter J. Blank
Editorial Director Jonathan D. Lazarus
Promotion Manager Ronnie Sonnenberg

ZIFF DAVIS PUBLISHING
President Richard P. Friese; President Consumer Magazine Division Albert S. Traina; Executive Vice President, Marketing and Circulation Paul H. Chook; Senior Vice President Phillip T. Heffernan; Senior Vice President Sidney Holtz; Senior Vice President Edward D. Muhfeld; Senior Vice President Philip Sine; Vice President Baird Davis; Vice President George Morrissey; Vice President Rory Parisi; Vice President William L. Phillips; Treasurer Selwyn Taubman; Secretary Bertram A. Abrams.
A+ is an independent journal, not affiliated in any way with Apple Computer, Inc. Apple is a registered trademark of Apple Computer, Inc. Entire contents Copyright © 1984 Ziff-Davis Publishing Co. All rights reserved; reproduction in whole or in part without permission is prohibited. The following are trademarks of Ziff-Davis Publishing Co.: A+, A+, The Independent Guide for Apple Computing, Dispatches, Rescue Squad, Thoughtware, That's Entertainment.
Permissions: Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Bette Amado, Ziff-Davis Publishing Company, 1 Park Ave., New York, NY 10016.

flashcard™

Instant disk response for Apple® computers.



The power to cover big business software.

Now you can breeze through business software at lightning speed. No more "disk wait" delays and constant disk accessing. With *flashcard*, you can run programs up to 10 times faster as you enjoy the instant response of solid state memory. *Flashcard™* is a plug-in memory board that makes the Apple II series think it's still working with the floppy. You simply copy your floppy onto *flashcard* and say goodbye to disk search delays.

A necessity, not a luxury. If you use WordStar® you need *flashcard*. If you use dBase II™ or InfoStar™ you need *flashcard*. If you run out of room with

"calc" software, you need *flashcard*. These are disk intensive programs that cause the Apple to return again and again to disk memory. And you sit and wait. *Flashcard* will eliminate these "time-outs" and give you "quick as a flash" disk response.

Available packaged with WordStar word processing software, InfoStar data base management software, MagiCalc® spreadsheet software.

- 144k one disk capacity \$495
- 288k two disk capacity \$695
- Flashcard* only.
- 144k one disk capacity \$395
- 288k two disk capacity \$595

Your computer store should have *flashcard* in stock. If not, ask them to order for you, or call Synetix direct.

800-426-7412



Synetix Inc.
10635 N.E. 38th Place
Kirkland, WA 98033
(206) 828-4884

In Canada: Exclusively by Chevo Computing, Mississauga, Ontario, (416) 821-7600.
CIRCLE 139 ON READER SERVICE CARD

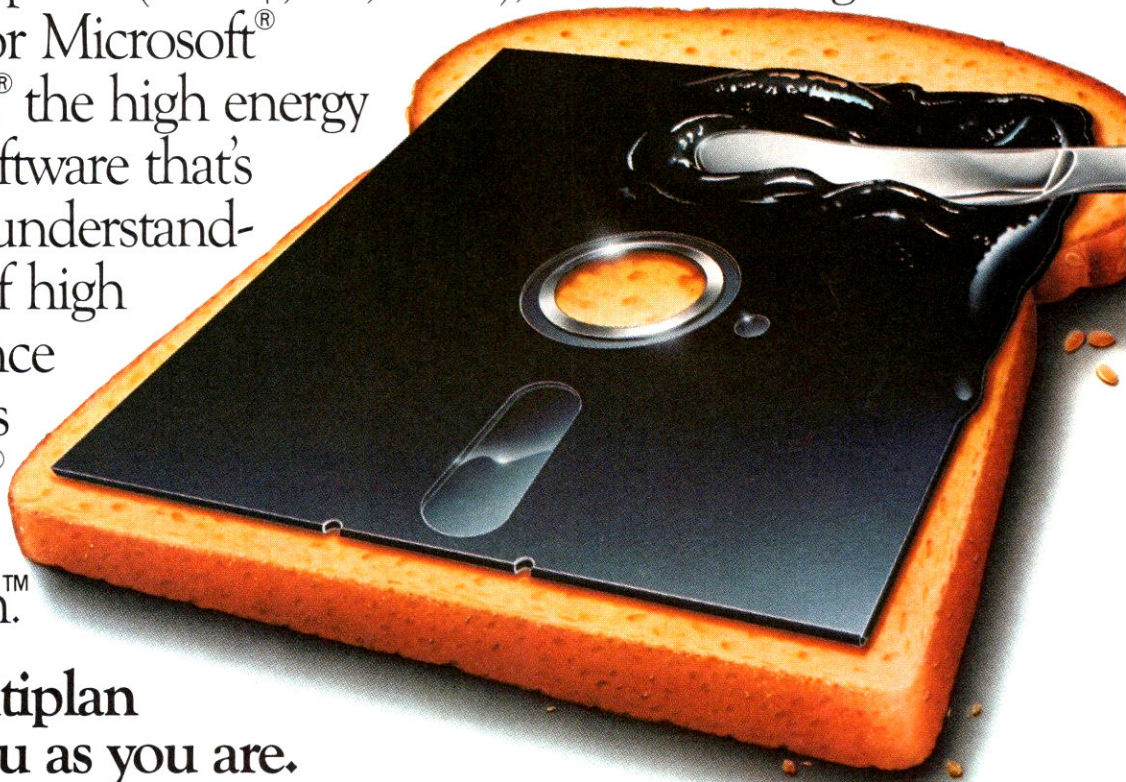
flashcard, Apple, WordStar, InfoStar, dBase II and MagiCalc are trademarks of Synetix, Inc., Apple Computer, Inc., MicroPro, Ashton-Tate and Artsci, Inc. respectively.

Don't buy a spreadsheet

A lot of electronic spreadsheets can't cover your needs. They just don't go far enough.

They can't adapt to the way you think. They speak in hieroglyphics (/GF\$, /R, /S#S), instead of English.

Time for Microsoft[®] Multiplan[®], the high energy spread. Software that's rich with understanding. Full of high performance capabilities for Apple[®] II, III or Macintosh[™].



Multiplan
loves you as you are.

Other spreadsheets force you to learn how they think. Multiplan learns how you think. It remembers the way you work. Anticipates frequent commands. Even offers suggestions on spreadsheet set-up.

Multiplan not only uses English commands, it allows you to create formulas in English. Instead of typing mysterious coordinates like H54-L73=BK154, you can simply name worksheet areas: Sales-Costs=Profit.

Multiplan can link data in different spreadsheets. Make a change on one, and every related one is changed.

that spreads too thin.

And if you have been working with VisiCalc®, Multiplan can read its data files and teach it new tricks. Like how to set up variable column widths and sort data.

The wish list.

Only Multiplan has optional Multiplan Application Programs that work with **MICROSOFT**® you to design and build custom spreadsheets for Budget Analysis or Financial Statement Analysis in minutes. Not hours.

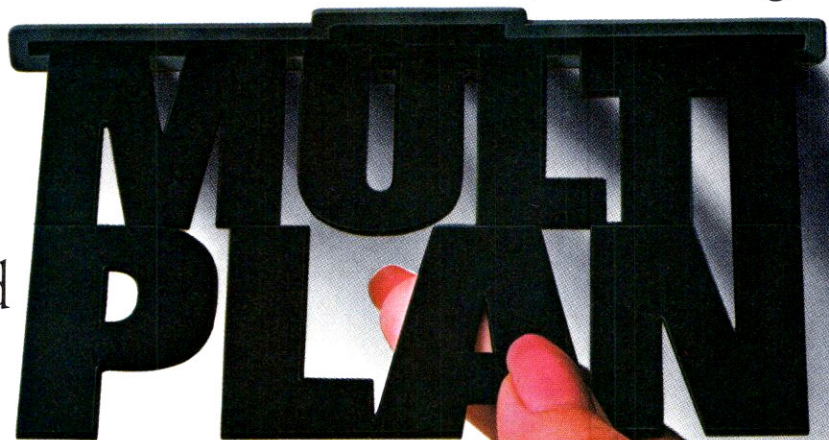
Not days.

Small wonder Microsoft gets more performance out of a spreadsheet. We designed the MS™ DOS operating system that tells the IBM® PC how to think. And our BASIC is the language spoken by nine out of ten micro-computers worldwide.

To get the best spread call 800-426-9400 (in Washington State call 206-828-8088) for your nearest Microsoft dealer. Now featuring Multiplan at a reduced price: **\$195.**

CIRCLE 319 ON READER SERVICE CARD

Suggested list price shown for Multiplan. Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation. Apple is a registered trademark and Macintosh is a trademark licensed to Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corporation. VisiCalc is a registered trademark of Visicorp.

A hand is shown from the bottom right, holding up large, black, three-dimensional block letters that spell out 'MULTIPLAN'. The letters are stacked in two rows: 'MULTI' on top and 'PLAN' on the bottom. The hand is positioned as if presenting the letters to the viewer.

286K
per 3"
disk
cartridge!

NOW AVAILABLE



AFTER YOUR FIRST DRIVE GO WITH AMDISK.

The AMDISK-I Micro-floppy disk system is an engineering breakthrough in disk size, storage capacity, media protection and user convenience. It's fully compatible with your Apple II*® and Apple IIe and is furnished with an interconnect cable. Enjoy a full 286K storage† capability and the extra convenience of the new 3" hard plastic encased diskette. Packed 10 per box, the disk cartridge fits into a shirt pocket and is easy to mail.

Suggested Retail Price . . . \$299 (3" cartridge \$6.99 ea.)

The Amdisk Single Drive system is ruggedly constructed for years of trouble-free operation and is backed with our 90 day warranty on parts and labor.

Just circle the reader service number for complete specifications.

* Apple II is a registered trademark of Apple Computer, Inc.
† Requires recording on both sides

2201 Lively Blvd. • Elk Grove Village, IL 60007
(312) 364-1180 TLX: 25-4786

AMDEK CORP.

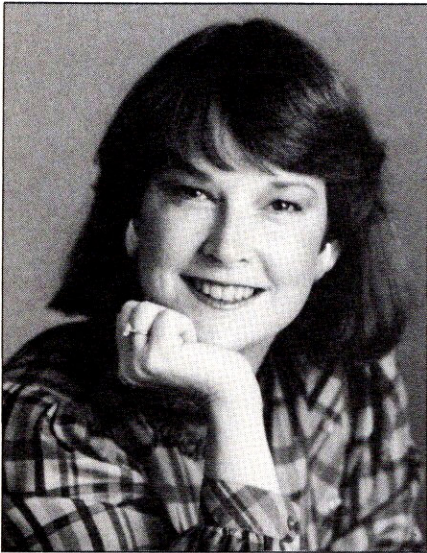
CIRCLE 107 ON READER SERVICE CARD

REGIONAL OFFICES: Calif. (714) 662-3949 • Texas (817) 498-2334

Amdek . . . your guide to innovative computing!



EDITORIAL A MESSAGE FROM MAGGIE



Macintosh—the name used to be a British word for a raincoat, but since January 24, the word Macintosh also means a cream-colored personal computer. After a lavish introduction of their new product, the makers of your first personal computer want to be the makers of your second one.

The Macintosh is quickly capturing the hearts and imaginations of many people. Crowds gather in the computer stores to get a look at this new marvel from Apple. And a marvel it is. The Macintosh is truly easy to operate for first-time users. We tested a few novices on the Mac, and they were immediately comfortable with the machine, quickly adapting to the mouse, while enjoying what Apple calls the “user interface.” This user interface, which consists of icons and pull-down windows with menus, is the main asset that, Apple hopes, will make the Macintosh a big hit. This interface is what makes the little machine so intriguing.

Apple is not the only firm that thinks the Macintosh will sell well; many major software and peripheral manufacturers are betting on Mac as well. We have talked to many of the companies Apple lists as official third-party developers, and they are all excited about the Macintosh and are in

the process of introducing a number of products for the new computer. We are witnessing the creation of a new market, which many firms will join.

We're betting on the Mac, too. We think the Mac is going to be a huge success, which is why we are introducing a new section in this issue to cover the new product. Our goal is to provide you with articles that will help you understand and use your computer to its fullest extent, particularly as it relates to business. This section will deal with the full 32-bit product line, which includes the new Macintosh and new versions of the Lisa. We will feature stories on how to use the Macintosh and the Lisa, from mastering the mouse to making the most of Multiplan. We will also tell you about new products and technological trends. Because of Apple's aggressive educational plan, we will cover Mac on campus as well. We are looking forward to writing about this innovative new product from Apple and encourage your comments and suggestions.

The new section on the Macintosh and the Lisa is not the only addition to *A+*. Responding to popular demand, we have expanded certain sections of the magazine. Rescue Squad is one of our most-read columns. As a result of an avalanche of mail, we are expanding Rescue Squad to try to keep up with your questions! We're also broadening our That's Entertainment section to include more game reviews, features, and product news.

We also provide information on how to use the Apple II series and the Apple III for professional purposes such as word processing, financial management, accounting, database management, graphics, and telecommunications, among others. Each issue we include articles that will help you with your buying decisions, such as choosing a hard disk or a modem. We also provide tutorials on the trickier aspects of computing, such as our “How to dBASE II” series. We feature regular columns such as Thoughtware and

Electronic Brainstorming to instruct as well as intrigue you and a monthly programming contest with cash awards.


I am pleased to announce a new regular column called News+ beginning in this issue from the technical editor of *A+*, Fred Davis. He will cover the computer-industry beat for us and keep you up to date on the latest developments, as well as entertain you with the folklore and history of personal computing.






Speaking of *A+*'s new technical editor, I would like to take this opportunity to introduce the other members of the *A+* editorial staff. Since the first issue we have added managing editor Leslie Steere, who comes from Miller Freeman Publications; senior copy editor Eva Langfeldt who came to *A+* from *InfoWorld*; senior staff editor Jane Willson, who is an Apple alumna from the II division as well as the Mac division; assistant editor Ruth Ramberg, who comes to *A+* from Addison-Wesley and the academic world; editorial assistant Candy De Santis, who also harks from Apple; and last, but certainly not least, my faithful assistant and office manager, Gae Brandon, who came with me when I left *InfoWorld* to start *A+*. Along with our free-lance writers, the eight of us produce *A+* each month. We are dedicated to our goal of producing the best and most informative magazine about Apple computers.

Like Apple, we are growing and changing to serve you better. We thank all of you who have written to us to offer suggestions, criticisms, and praise. We thoroughly enjoy reading your letters, so please keep them coming! Thank you for reading *A+* and making us the largest Apple magazine after only our sixth month of publication.



Maggie Cannon

See Jane™ run




Once there was a  time,

before the written word, when  people used  pictures to communicate. Symbols representing entire  ideas were easy to  see and understand. And the people were comfortable with this language. And they were  happy.

But then came the  computer.

And symbols were replaced by complicated commands. Soon data processing meant learning a whole new vocabulary. And the  people became frightened of the new computer language. And they were  sad.


Then came Jane.

Absolutely, positively, unequivocally, unquestionably, the most simple way to operate a  computer. Jane does away with the keyboard . Instead, a simple, hand-held device called a  mouse selects from a variety of applications. From letters to lists, to calculations and spreadsheets. Jane does them all.

Jane does away with complex command words.

Instead, simple, easy-to-understand  pictures tell the computer what to do.

From one operation to many, all on one screen at the same time.

Best of all, Jane doesn't cost lots of  money. Now everyone can use a home computer. Jane gives back to the people a language they understand.

And they  Jane. You can too.

One word is worth a thousand pictures.

Jane

Jane comes complete with Janewrite™, Janecalc™, Janelist™, and of course, a mouse.

 arktronics 113 South Fourth Avenue, Ann Arbor, Michigan 48104, 1-800-Call ARK, in Michigan, (313) 769-7253

CIRCLE 267 ON READER SERVICE CARD

Jane is now available for the Apple II, II+ [64K], IIe, Commodore 64. Available soon for the new Atari™ series and the IBM PC™ and compatibles. Apple™, Commodore™, IBM™ and Atari™ are all registered trademarks.



LETTERS TO THE EDITOR

Dear A +,

In *A + Dispatches* (volume 1, issue 1) "A Matter of Policy," it was stated that "no insurance firm appears to be offering a stand-alone personal computer policy yet . . ." I wish to inform you that this is not correct. According to *Personal Computing* (August 1983), there are three companies that offer such protection, although the extent of coverage and the premiums vary. These companies are:

Columbia National General Agency, Inc.

88 East Broad Street
Columbus, OH 43215
(800) 848-3469

Data Security Insurance Agency, Inc.

4800 Riverbend Road
Boulder, CO 80301
(300) 443-3600

Personal Computer Insurance Agency

1655 Willow Street
P.O. Box 28506
San Jose, CA 95159
(408) 723-8107

I hope you will pass this useful information along to your readers. Thank you.

Frank Slansky, Jr.
Gainesville, FL

Dear A +,

I want to personally thank you for the fine content of your editorial in *A +*, Volume 2, Issue 1 [on the subject of computer crime]. More than ever, people who care must play important roles if things are to turn out right in this industry.

All issues have a moral character as legislators are keeping pace with bureaucracy, and this industry moves at the speed of light. To stop and address the ethical values is extremely important for assured future growth.

The favor we can do ourselves if we are in the software business is to keep things straight and honest. Meanwhile,

morality in humankind must make up for the lack of sparkling energy of the bureaucracy itself.

Kristjan Ranniste
President
Software Library
Ann Arbor, MI

Dear A +,

The January '84 issue of *A +* was the first computer magazine for the Apple that was good, easy, informative reading. Congratulations on a worthwhile publication.

It's too bad, however, that you didn't review Dollars and Sense in your article "Computerizing Your Checkbook."

John T. Ramos
Daly City, CA

Thank you. We have a full review of Dollars and Sense in our March 1984 issue.

Dear A +,

In the January 1984 *A +*, you state, in response to a question about garbage collection, "There is no way to prevent or predict these pauses . . ." Untrue!

I wish to call to your attention my articles "Garbagemen Strike" and "Weed Out the Trash" in the August and November 1982 issues of *Call-A.P.P.L.E.* (a publication of the Apple Pugetsound Program Library Exchange, 21246-68th Ave. S., Kent, WA 98032).

There, I explain how the programmer can always reduce, and often totally eliminate, the garbage-collection process by manipulating the string space pointer at locations 111 and 112 (hexadecimal \$6F and \$70).

Clay Ruth
Staff Writer
Call-A.P.P.L.E.
Dyer, IN

Dear A +,

At first when I heard there was to be a new Apple Computer-oriented maga-

zine, I was not enthusiastic at all. We already get *Softalk*, *Nibble*, *InCider*, *Call-A.P.P.L.E.*, *Creative* and *Popular Computing* as gifts from the benefactor of our Community who gave us his own Apple II Plus, two Apple disk drives, Epson MX-80FT, and numerous books and programs.

Then the wonderful January issue came with the article on graphics by Dorothy Clark. Now, I am not all that "gung-ho" about graphics, but what attracted me to the article was the blown-up illustration of binary codes and then their conversion to hexadecimal numbers.

I must confess to having skipped over Part 1 of the article which had been in the December issue (Volume 1, Issue 2), but I immediately went back and toiled through the whole article . . . doing all the routines.

This lady, Dorothy Clark, is a fine teacher. She is to be commended. Most of the books and tutorials and even the highly touted professional programs all seem to start at about the 4th floor, while I am stuck in the basement without elevator or stairs. Maybe it is because I am a latecomer to the computer age and all the beginners' material was covered in earlier periodicals.

Sister Mary Emmanuel, O.P.
Lufkin, TX

Dear A +,

I have been studying your new magazine, *A +*, with great interest. Your articles have been most stimulating. However, you have a serious glitch in your article on robotics in *A + Dispatches*, page 24 of Volume 1, Issue 1. You state, "The same machine that can pick up a knight and move it three spaces ahead, two to the right, can also check drill bits on an assembly line."

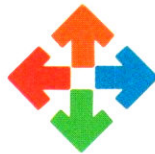
The knight move in chess is one column to the side and one row forward or backward, performed in either order. The knight always changes the color of

You'd be amazed how much time you waste thinking by hand.

Think with ThinkTank instead.
The idea processor. (Get the ideas right,
and the right words always follow.)
It's that simple.
Ask for a demonstration at a well
organized, imaginative dealer near you.

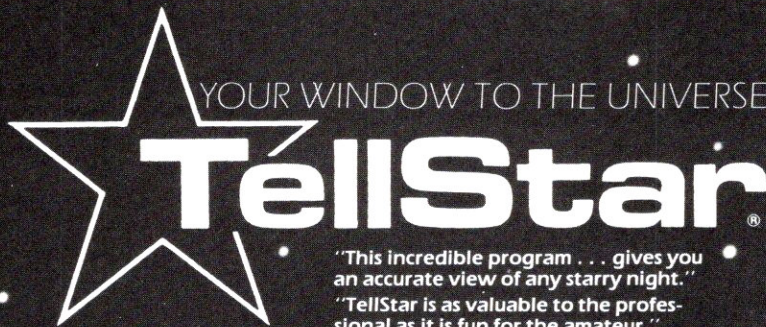
ThinkTank and
"The First Idea Processor"
are trademarks of
Living Videotext, Inc.

THINKTANK™



1000 Elwell Court
Palo Alto, CA 94303
(415) 964-6300 ext 729

Used by elementary schools, universities, planetariums, and observatories worldwide.

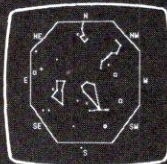


"This incredible program . . . gives you
an accurate view of any starry night."

"TellStar is as valuable to the profes-
sional as it is fun for the amateur."

As reviewed in:
Personal Software
Feb. 1984

TellStar is your per-
sonal guide to the
stars helping you
discover the excite-
ment of astronomy; whether you're 6 or
60. You will see, locate, and identify con-
stellations, stars, planets, and other stellar
objects with graphic displays.



	IBM-PC or JR	Apple II
*Level I One Star Table	\$ 49.95	\$39.95
*Level II Three Detailed Star Tables Including All Of The Fascinating 'Messier' Objects	99.95	79.95
*Level II IBM PC's Equipped With An 8087 NDP	129.95	n/a

Add \$3.00 shipping and handling charges. CO
residents include additional 6.15% sales tax. VISA
and Mastercard accepted with signed order. Interna-
tional sales: please write. Dealer inquiries invited.

©1984 **Scharf Software Systems, Inc.**
Suite 1068, 2111-M 30th St. Dept. AP
Boulder, CO 80301 (303) 666-5353



IBM and Apple are registered trademarks of International Business Machines Corp. and Apple Computer, Inc. respectively.

the square on which it lands; i.e., if it
starts on a white square, it ends on a
black square and vice versa.

Kenneth Wilmarth
California

Corrections

Page 27 of Volume 2, Issue 3 errone-
ously states that one of the Macintosh's
RS-422 I/O ports is for a 230K-baud
modem. In actuality, the I/O port is ca-
pable of 230K-baud transmission, but
the modem referred to operates only at
a speed of 300-1200 baud.

On page 33 of the same issue, we in-
correctly identified the members of the
Macintosh design team in a picture
caption. The caption should have read
from left to right: Bill Atkinson, Andy
Hertzfeld, Chris Espinosa, George
Crow, Joanna Hoffman, Burrell Smith,
and Jerry Manock.

We would also like to correct two er-
rors in Volume 2, Issue 2. On page 150
we quoted a price of \$39.95 for the Ge-
nie 5+5 hard-disk drive; the actual
price is \$3995. On page 18, we referred
to Bank Street Writer from Brøder-
bund as a "computer-game hit." The
program in reality is a word-processing
program.

An article "Hardware, Software,
and Tupperware" in the Dispatches
section of our February 1984 issue de-
scribed Wallace Micro-Mart, Inc., of
Peoria, Illinois, as an Apple computer
"mail-order" company. We print below
a statement from Wallace Micro-Mart
that seeks to clarify that it does not
mail-order Apple Computer products.

*It stands corrected that Wallace Mi-
cro-Mart, Inc. does not mail order Ap-
ple Computer, Inc. products and that
Wallace Micro-Mart does not condone
the mail order of any Apple Computer,
Inc. products by any company or indi-
vidual.*

*Wallace as an 'Apple only' dealer
has supported Apple Computer, Inc.
extensively in the Peoria, Illinois, vi-
cinity. Wallace offers complete train-
ing, and exceptional after-sale support
on Apple computers, and suggests that
every Apple computer owner should re-
ceive this same respect from all Apple
dealers which cannot be offered
through the mail in any sense of the
word.*

*Ronald A. Wallace
President
Wallace Micro-Mart, Inc.
Peoria, IL*

THE MOST USEFUL IDEAS ARE OFTEN REMARKABLY SIMPLE.



The first filing system was a remarkably simple way to do incredibly useful things. Like organize a business and make it work.

PFS®:FILE and PFS:REPORT are remarkably simple software programs that can help you organize your business faster and more effectively.

And both programs are amazingly easy to learn. FILE and REPORT were designed for people without computer experience. So all instructions are easy to understand. And you can be productive quickly.

FILE lets you record, retrieve and review information like personnel records and purchase orders. Instantly. You can even cross reference by department or job or however you want.

And you can arrange information in "forms" you design yourself. Or you can take advantage of PFS SOLUTIONS which are pre-designed forms for popular applications like inventory, invoices and ledgers. Either way, you can quickly and easily create the filing system that fits your needs. Not your computer's.

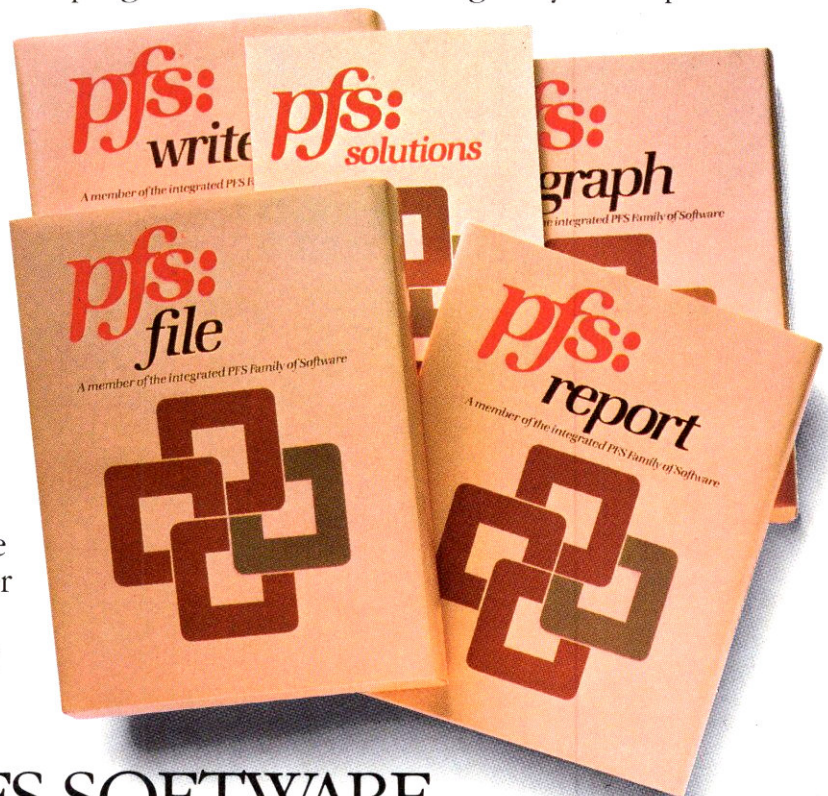
REPORT is the perfect companion program to FILE. Because it gives you the power to summarize and perform calculations on information you've stored with FILE.

With REPORT, you can create presentation quality summaries in table form in just minutes. Automatically sorted, calculated, formatted and printed!

FILE, REPORT and SOLUTIONS are fully integrated with the PFS Family of Software. Which means your computing capabilities can always expand to meet your needs.

PFS: It's the powerful software that's simple to learn. It's the power of simplicity.

See your computer dealer for more details.



PFS SOFTWARE THE POWER OF SIMPLICITY

PFS:FILE, PFS:REPORT and PFS SOLUTIONS currently work on IBM® Apple® Radio Shack, DEC, Hewlett Packard, Texas Instruments, Panasonic and other personal computers. © Software Publishing Corporation

CIRCLE 130 ON READER SERVICE CARD

▶ LEARNING FOR DOLLARS

If you want to help kids learn, make it a game, give them a challenge. So say many education pundits. Two companies have taken those words to heart and are sponsoring contests they hope will encourage children to expand their computer literacy and their product awareness.

Krell Software Corporation of Stony Brook, New York, is touting The Great American \$50,000 S.A.T. Contest.

At stake are prizes of up

to \$1500 worth of personal-computer equipment. To win, a person must use Krell's College Board S.A.T. Prep Series of software to achieve the highest S.A.T. score or the most improved S.A.T. score.

And for the 18-year-old-and-under set, Kraft (as in cheese) is offering the Kraft Kideo Game Contest. Entrants must submit a written description of a computer game that would teach 3- to 8-year-olds about nutrition.

Put your thinking caps on, kids!

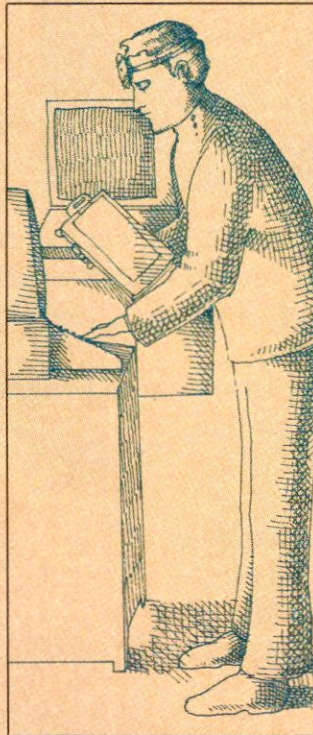
For information about the S.A.T. contest, contact Krell Software at 1320 Stony Brook Road, Stony Brook, NY 11790. For the Kraft contest, write P.O. Box 845, South Holland, IL 60473.

▶ EXTRA CREDIT FOR BUYERS

Only a few months ago, Apple entered the retail credit world with its own contribution to the world of plastic, the Apple Card. Now the Apple Card's credit limit has been extended, or rather, lowered, so that more customers can take advantage of buying computers and computer products on the never-never.

General Electric Credit Corporation offers the Apple Card, which can be used at any of the nation's 800 authorized Apple dealerships. Apple Cards can now finance a minimum of \$200 in hardware, as opposed to the card's original bottom line of \$825. Customers need no longer purchase a computer to be eligible for a credit

purchase, either. Apple hopes consumers will take the card down to the dealer and buy up the raft of new machines and software. Who says you need a friend at Chase Manhattan?



▶ YOU CAN'T FOOL US

We know you're out there. There are a million computer stories in the Naked City . . . tell us a few. *A+* pays \$50 for items of news, gossip, or strange-but-true computer stories we can use in these pages.

Include your name, address, and telephone number with each item. (We will preserve your anonymity on request.) All submissions become the property of *A+* magazine and are subject to editing. Please send your stories to Dispatches, c/o *A+* magazine, 11 Davis Drive, Belmont, CA 94002.

▶ WATCH OUT, QUINCY

Apples can do more than keep the doctor away—they can even help forestall the coroner.

For instance, when an epidemiologist at the Memphis and Shelby County Health Department in Tennessee brought his personal Apple II to work, he found it invaluable in organizing data on communicable and venereal diseases, food-poisoning cases, and animal bites. Thanks to the department's new databases, the department can zero in on sectors affected by disease and better formulate countermeasures.

In analyzing animal-bite data, for instance, the department discovered that one popular pet, the German Shepherd, accounted for 27% of all dog bites. This guard dog could actually be a serious health problem, the epidemiologist said.

Another example: the computer program developed to record cases of bacillary dysentery showed researchers that the disease largely affected black children less than nine years old. Comparing printouts of cases by census tract to other socio-economic data confirmed that the disease is almost solely confined to the poor. Now the department knows where to start fighting the illness.

The computer may not be able to stalk into a health administrator's office to demand action, but it can help public-health workers catch a problem before it gets to the coroner.

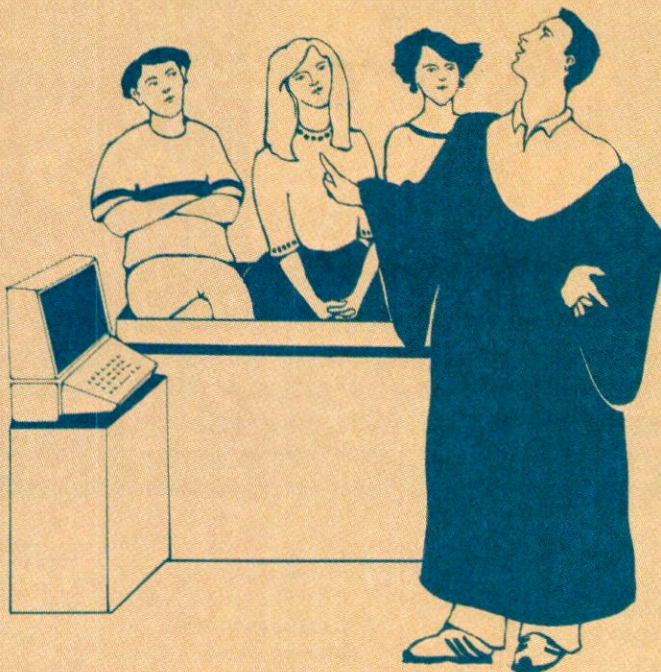


▶ KEEPING HACKERS CLEAN

More and more U.S. teenagers have access to computers at home or at school. According to a recent survey by Teen-Age Research Unlimited in Lake Forest, Illinois, 5% of the respondents had bought a personal computer in the past 12 months—up from 3% the previous year. Ten percent of the teenagers said they had used a personal computer at home that week; one-and-a-half times as many boys worked on the computer keyboard as girls.

With so many teenagers tapping into computers, educators (and government, businesses, and parents) have wondered how to prevent a recurrence of last year's hacker scare, when young computer users broke into computer data banks for the fun of it. Now the Los Angeles County schools have begun several pilot programs to teach computer students the ethics of hacking.

About a dozen of the county's 81 public-school districts teach courses deal-



ing with computer crime, privacy rights, and copyright laws. Students may debate the propriety of specific computer crimes or play the role of the computer executive whose program has been pirated by a hacker.

Los Angeles schools are understandably nervous about the possibility of youthful hackers since the county averages one computer for every 135 students.

And well they might be, because the initial response from their students has been mixed. One Culver City student who admitted he had already broken into a private data bank said, "If you could do it without getting caught, you should."

▶ JUDGE FOR YOURSELF

Can a video game dispense justice? With your help, perhaps. Soon you may be able to hone your own legal knowledge and intuition by comparing them to the ex-

pertise of federal and state judges, ruling on 18 different crimes from murder to shoplifting.

Your chance to interpret the law comes when you play two "fun introductions to the criminal justice system," *Crime and Punishment* and *Search and Seizure*. Both games were written by lawyer/educators Graeme Newman, acting dean of the School of Criminal Justice at the State University of New York at Albany, and Jack Kress, a professor at Delaware Law School.

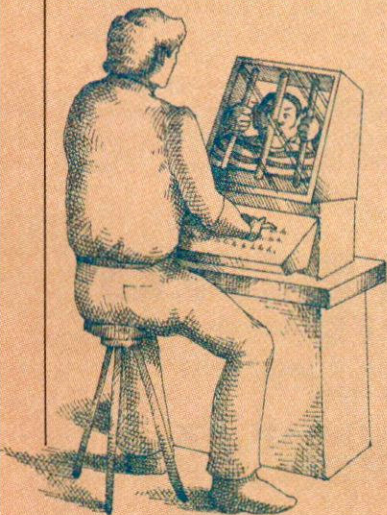
In *Crime and Punishment*, you get to exercise your "jurist's prudence." You're confronted with a convicted criminal and required to mete out justice as you see fit, based on the information you call up from the game's data banks. Your sentence is then rated against the decisions of actual judges in similar cases. Five gavels appearing on the screen after you've laid down the law indicate that you've

walked the same legal path as most other judges. One gavel, jokes Newman, means "you might be better off in a kangaroo court."

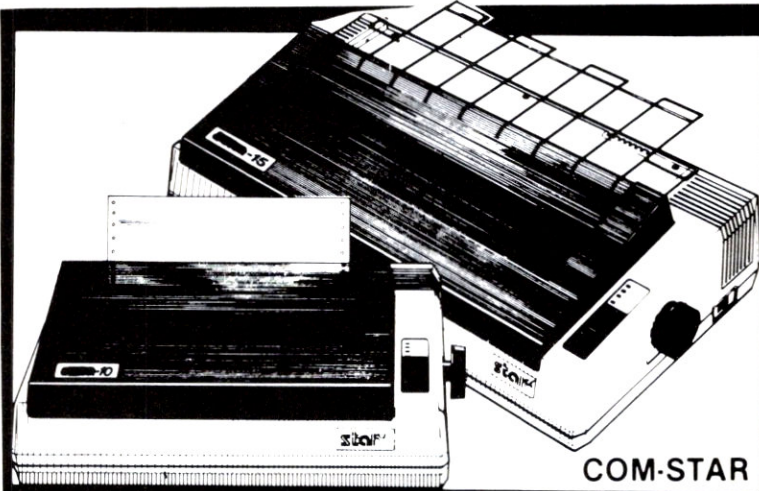
Search and Seizure transforms you into a police officer gathering evidence for a randomly chosen crime. Should you give chase, search the premises, fire your weapon, or simply drop the case? (In some instances you garner game points for dropping a case. This is predicated on the assumption that a detective's time is valuable, and a 12-hour-old shoplifting case generally carries less weight than a 2-hour-old kidnapping.)

Coauthor Kress describes these games as being like "Zork with reality," or "text-based 'real' games." The databases for these games derive from research Kress did for the federal government on discrepancies in sentencing. He hastens to add that the point of these games isn't necessarily to turn the player into the "average" judge, but to make players think about the reasons behind a particular sentence. "We're very much activist reformers, my colleague and I," says Kress. "When you don't match the norm of judges, don't say, 'Hey, I'm dumb.' Go out and say, 'Maybe I'm right.'"

Decision Making Systems Ltd., the Newman and Kress company in Wilmington, Delaware, currently offers these games for only the TI 99/4A, but is negotiating for the Apple versions. Kress expects that Apple owners will be taking the law into their own hands sometime this summer.



80 COLUMN PRINTER SALE—\$149.00*



COM-STAR T/F

Tractor
Friction
Printer

only **\$199****

• 15 Day Free Trial - 180 Day Immediate Replacement Warranty

• **Lowest Priced, Best Quality, Tractor-Friction Printers in the U.S.A.**

- **Fast 80-120-160 Characters Per Second** • **40, 46, 66, 80, 96, 132 Characters Per Line Spacing**
- **Word Processing** • **Print Labels, Letters, Graphs and Tables** • **List Your Programs**
- **Print Out Data from Modem Services** • **"The Most Important Accessory for Your Computer"**

*STX-80 COLUMN PRINTER—\$149.00

Prints full 80 columns. Super silent operation, 60 CPS, prints Hi-resolution graphics and block graphics, expanded character set, exceptionally clear characters, fantastic print quality, uses inexpensive thermal paper! Best thermal printer in the U.S.A.! (Centronics Parallel Interface).

**DELUXE COMSTAR T/F 80 CPS PRINTER—\$199.00

The COMSTAR T/F (Tractor Friction) PRINTER is exceptionally versatile. It prints 8½" x 11" standard size single sheet stationary or continuous feed computer paper. Bi-directional, impact dot matrix, 80 CPS, 224 characters. (Centronics Parallel Interface).

Premium Quality—120 CPS COMSTAR T/F SUPER-10X PRINTER—\$289.00

COMSTAR T/F (Tractor Friction) SUPER-10X PRINTER gives you all the features of the COMSTAR T/F PRINTER plus a 10" carriage, 120 CPS, 9 x 9 dot matrix with double strike capability for 18 x 18 dot matrix (near letter quality), high resolution bit image (120 x 144 dot matrix), underlining, back spacing, left and right margin settings, true lower decenders with super and subscripts, prints standard, italic, block graphics

and special characters, plus 2K of user definable characters! The COMSTAR T/F SUPER-10X PRINTER was Rated No. 1 by "Popular Science Magazine." It gives you print quality and features found on printers costing twice as much!! (Centronics Parallel Interface) (Better than Epson FX 80).

Premium Quality—120 CPS COMSTAR T/F SUPER-15½" PRINTER—\$379.00

COMSTAR T/F SUPER 15½" PRINTER has all the features of the COMSTAR T/F SUPER-10X PRINTER plus a 15½" carriage and more powerful electronics components to handle large ledger business forms! (Better than Epson FX 100).

Superior Quality SUPER HIGH SPEED—160 CPS COMSTAR T/F 10" PRINTER—\$489.00

SUPER HIGH SPEED COMSTAR T/F (Tractor Friction) PRINTER has all the features of the COMSTAR SUPER-10X PRINTER plus SUPER HIGH SPEED PRINTING—160 CPS, 100% duty cycle, 8K buffer, diverse character fonts, special symbols and true decenders, vertical and horizontal tabs. RED HOT BUSINESS PRINTER at an unbelievable low price!! (Serial or Centronics Parallel Interface)

Superior Quality SUPER HIGH SPEED—160 CPS COMSTAR T/F 15½" PRINTER—\$579.00

SUPER HIGH SPEED COMSTAR T/F 15½" PRINTER has all the features of the SUPER HIGH SPEED COMSTAR T/F 10" PRINTER plus a 15½" carriage and more powerful electronics to handle larger ledger business forms! Exclusive bottom paper feed!!

PARALLEL INTERFACES For VIC-20 and COM-64—\$49.00 For All Apple Computers—\$79.00

NOTE: Other printer interfaces are available at computer stores!

Double Immediate Replacement Warranty

We have doubled the normal 90 day warranty to 180 days. Therefore if your printer fails within "180 days" from the date of purchase you simply send your printer to us via United Parcel Service, prepaid. We will IMMEDIATELY send you a replacement printer at no charge, prepaid. This warranty, once again, proves that WE LOVE OUR CUSTOMERS!

Add \$17.50 for shipping, handling and insurance. 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! Canada orders must be in U.S. dollars. VISA — MASTER CARD ACCEPTED. We ship C.O.D.

PROTECTO ENTERPRIZES (WE LOVE OUR CUSTOMERS)

BOX 550, BARRINGTON, ILLINOIS 60010
Phone 312/382-5244 to order

SUPER-10"

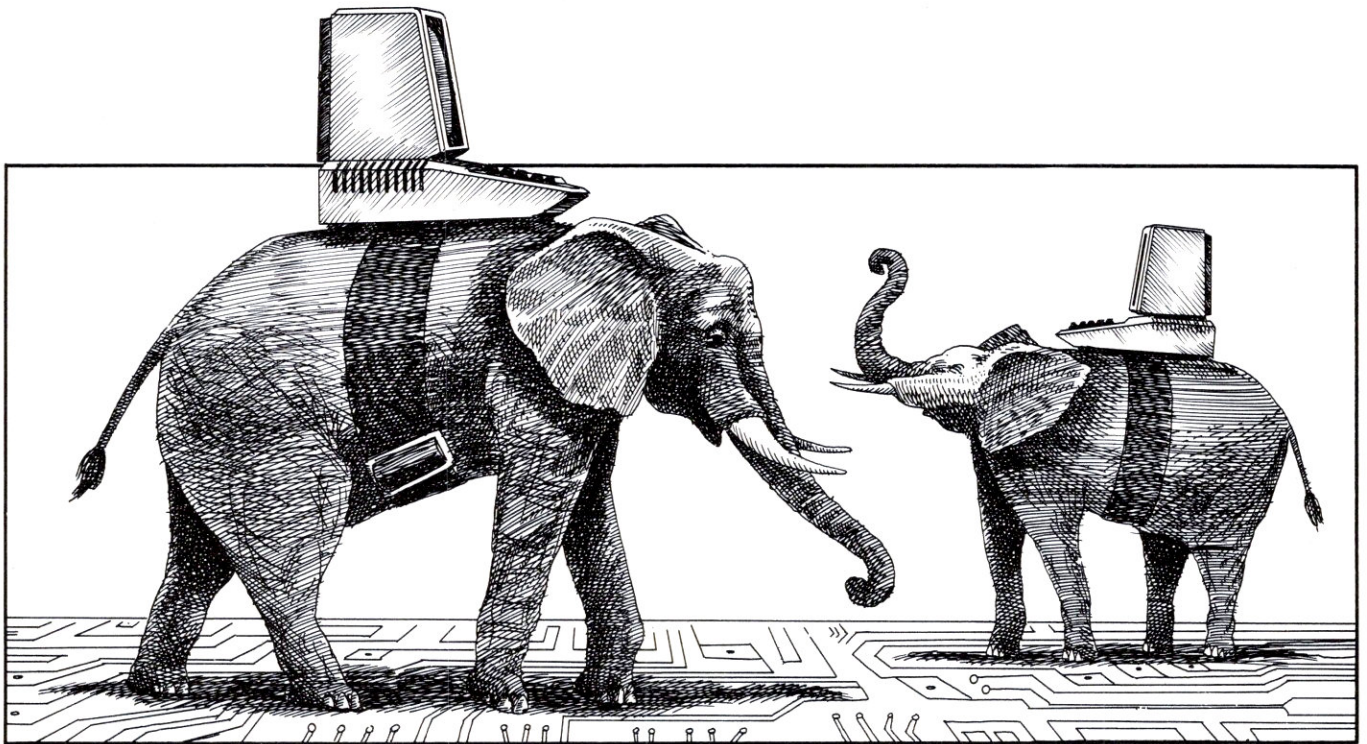
ABCDEFGHIJKLMN OPQRSTUVWXYZ
ABCDEFGHIJKLMN OPQRSTUVWXYZ 1234567890

CIRCLE 127 ON READER SERVICE CARD



THOUGHTWARE/BY STEVE ROSENTHAL

How your Apple hangs on
to information



MASS MEMORY STORAGE

An Apple without mass memory storage makes a useful calculator or controller, but if you want the full use of your computer, you'll need to equip your machine with more than just its standard memory chips. For an Apple to do its work well, it needs a safe place to store information.

The Apple II family of computers, in deference to the technology and economics of the late 70s, can store data on an audiotape recorder, but the mainstay for all Apples is the magnetic disk. For exotic applications, we now also have a few nondisk alternatives.

In addition to supplying a place to store data that won't fit in memory and that stays available when power is turned off, diskettes are also the principal means for software distribution. But what's best for one of these roles is not always best for the other one.

Never Enough Memory

Early Apple owners often started with as little as 16K (16,000 characters) of random-access memory and still were able to write programs and

No matter how quickly memory prices fall, uses for extra memory increase more rapidly.

get enjoyment and useful work from their machines. But one of the virtues of Apples and other early personal computers was that they gave people a glimpse of better possibilities—and most of them required more memory

space for more complex programs.

One of the pioneers of the integrated-circuit business, Robert Noyce, pointed out that the number of bits on new memory chips tends to double every two years—but because of the economics of manufacturing, the cost quickly falls to the price of the previous chip generation. As a result of this trend, memory has become cheap enough that most Apple users can afford extra RAM.

No matter how quickly memory prices fall, however, uses for extra memory increase more rapidly. AppleSoft BASIC, standard with the Apple II Plus and IIe, requires more memory than the Integer BASIC that came with the older II. ProDOS, the new operating system for the Apple II family, uses more memory than does DOS. Application programs, once mainly short

Introducing Macintosh. What makes it tick. And talk.

Well, to begin with, 110 volts of alternating current.

Secondly, some of the hottest hardware to come down the pike in the last 3 years.

The garden variety 16-bit 8088 microprocessor.



Macintosh's 32-bit MC68000 microprocessor.



Some hard facts may be in order at this point:

Macintosh's brain is the same blindingly-fast 32-bit microprocessor we gave our other brainchild, the Lisa™ Personal Computer. Far more powerful than the 16-bit 8088 found in current generation computers.

Its heart is the same Lisa Technology of windows, pull-down menus, mouse commands and icons. All of which make that 32-bit power far more useful by making the Macintosh™ Personal Computer far easier to use than current generation computers. In fact, if you can point without hurting yourself, you can use it.

Now for some small talk.

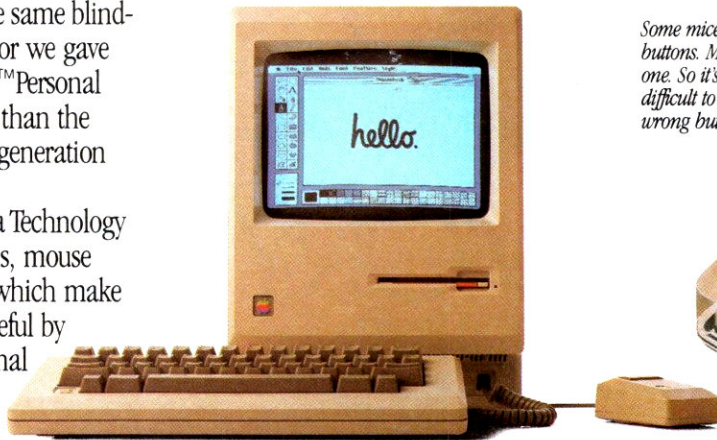
Thanks to its size, if you can't bring the problem to a Macintosh, you can always

bring a Macintosh to the problem. (It weighs 9 pounds less than the most popular "portable.")

Another miracle of miniaturization is Macintosh's built-in 3½" drive. Its disks store 400K—more than conventional 5¼" floppies. So while they're big enough to hold a desk full of work, they're small enough to fit in a shirt pocket. And, they're totally encased in a rigid plastic so they're totally protected.

And talk about programming.

There are already plenty of programs to keep a Macintosh busy. Like MacPaint™,



a program that, for the first time, lets a personal computer produce virtually any image the human hand can create. There's more software on the way from developers like Microsoft®, Lotus™, and Software Publishing Corp., to mention a few.

And with Macintosh BASIC, Macintosh Pascal and our Macintosh Toolbox for writing your own mouse-driven programs, you, too, could make big bucks in your spare time.

You can even program Macintosh to talk in other languages, like Yiddish or Serbo-Croatian, because it has a built-in polyphonic sound generator capable of producing high quality speech or music.

*The Mouse itself:
Replaces typed-in computer commands with a form of communication you already understand — pointing.*

Some mice have two buttons. Macintosh has one. So it's extremely difficult to push the wrong button.

The inside story — a rotating ball and optical sensors translate movements of the mouse to Macintosh's screen pointer with pin-point accuracy.

All the right connections.

On the back of the machine, you'll find built-in RS232 and RS422 AppleBus serial communication ports. Which means you can connect printers, modems and other peripherals without adding \$150 cards. It also means that Macintosh is ready to hook in to a local area network. (With AppleBus, you will be able to interconnect up to 16 different Apple computers and peripherals.)

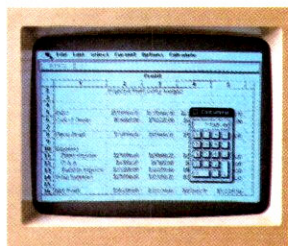
Should you wish to double Macintosh's storage with an external disk



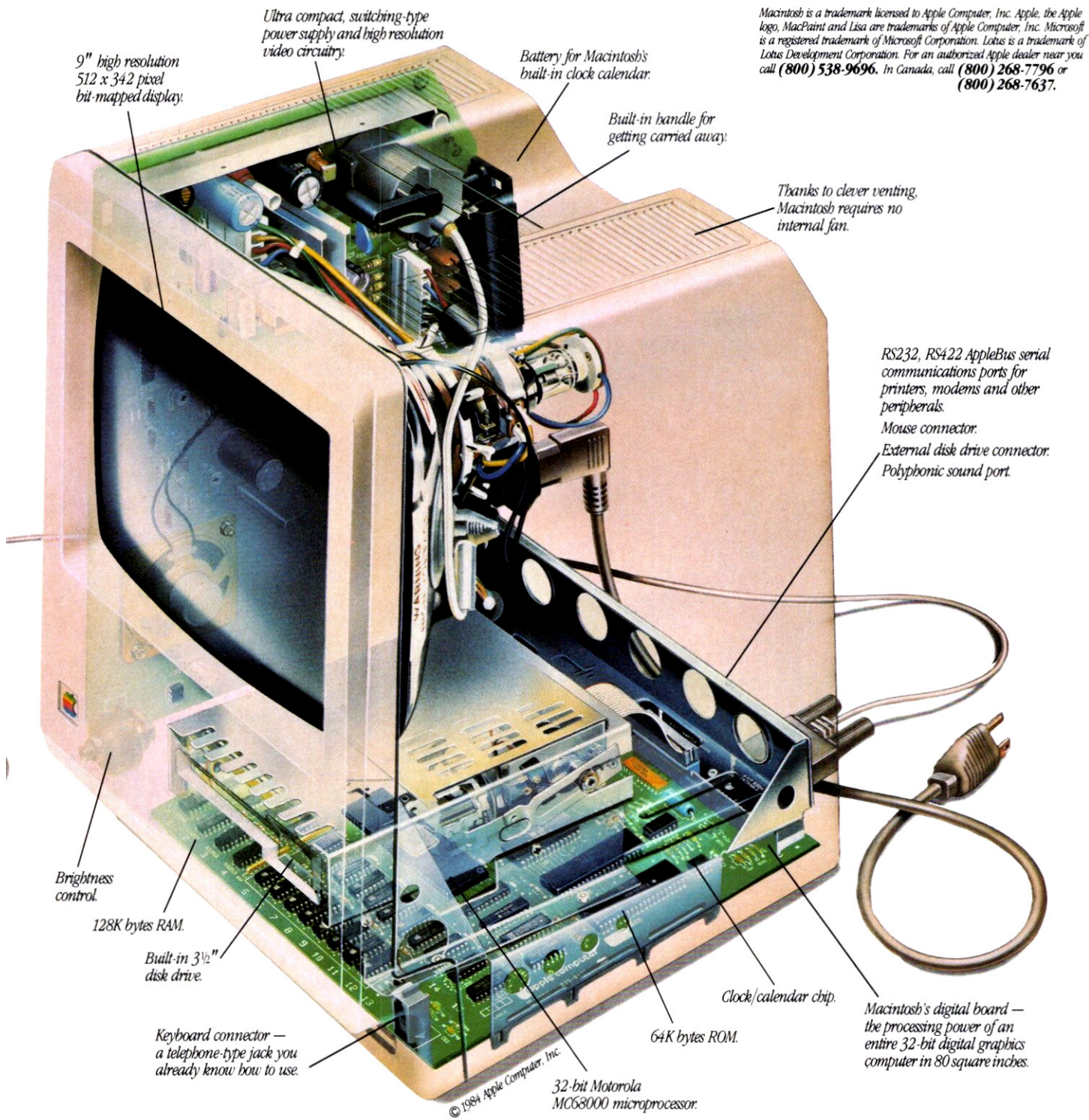
Macintosh automatically makes room for your illustrations in the text.



MacPaint produces virtually any image the human hand can create.



Microsoft's Multiplan for Macintosh.



Macintosh is a trademark licensed to Apple Computer, Inc. Apple, the Apple logo, MacPaint and Lisa are trademarks of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Lotus is a trademark of Lotus Development Corporation. For an authorized Apple dealer near you call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.

9" high resolution 512 x 342 pixel bit-mapped display.

Ultra compact, switching-type power supply and high resolution video circuitry.

Battery for Macintosh's built-in clock/calendar.

Built-in handle for getting carried away.

Thanks to clever venting, Macintosh requires no internal fan.

RS232, RS422 AppleBus serial communications ports for printers, modems and other peripherals.

Mouse connector.

External disk drive connector. Polyphonic sound port.

Brightness control.

128K bytes RAM.

Built-in 3 1/2" disk drive.

Keyboard connector — a telephone-type jack you already know how to use.

Clock/calendar chip.

64K bytes ROM.

Macintosh's digital board — the processing power of an entire 32-bit digital graphics computer in 80 square inches.

© 1984 Apple Computer, Inc.

32-bit Motorola MC68000 microprocessor.

drive, you can do so without paying for a disk controller card—that connector's built-in, too.

There's also a built-in connector for Macintosh's mouse, a feature that costs up to \$300 on computers that can't even run mouse-controlled software.

One last pointer.

Now that you've seen some of the logic, the technology, the engineering genius and the software wizardry that separates

Macintosh from conventional computers, we'd like to point you in the direction of your nearest authorized Apple dealer.

Over 1500 of them are eagerly waiting to put a mouse in your hand. As one point-and-click makes perfectly clear, the real genius of Macintosh isn't

its 32-bit Lisa Technology, or its 3 1/2" floppy disks, or its serial ports, or its software, or its polyphonic sound generator.

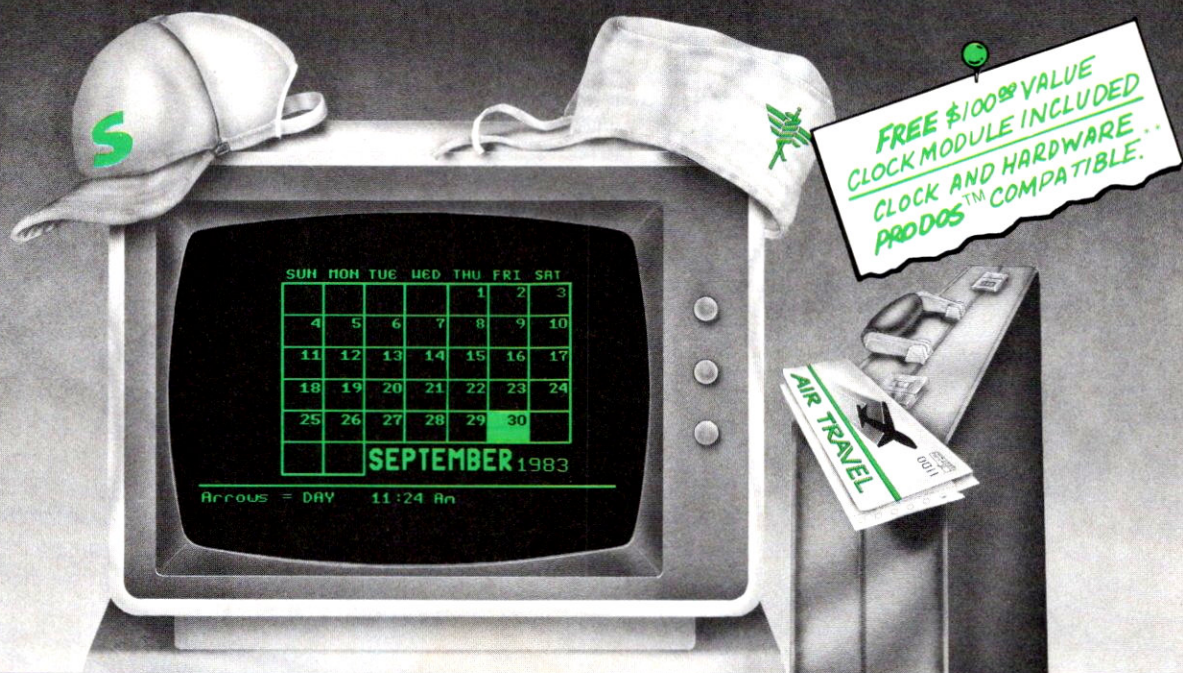
The real genius is that you don't have to be a genius to use a Macintosh.

You just have to be smart enough to buy one.

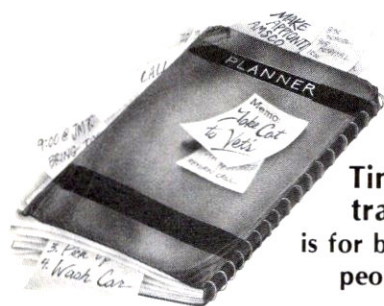
Soon there'll be just two kinds of people. Those who use computers. And those who use Apples.



Suzie's First Softball Game. . . The Two Places-At-Once Schedule . . .Meeting With The Boss.



Time-trax™ Would Have Remembered.



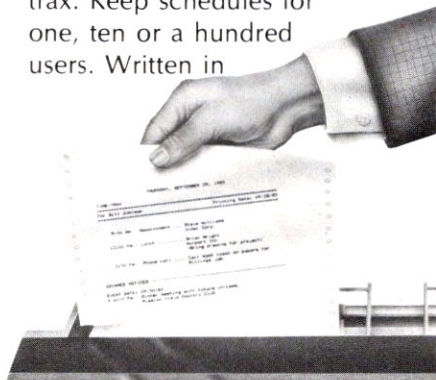
Time-trax™
is for busy people.

Time-trax is a time and date oriented calendar program that will remind you of appointments, errands, phone messages, birthdays, holidays, bills to pay and much more. Time-trax can even notify you in advance of pending important events.

Entirely menu driven, Time-trax is very easy to use. With a simple key-stroke you can make, review and edit entries or search for any entry from past, present or future months. Customize Time-trax entries with your own, meaningful category

labels. Print out a day, a month or any period of time easily.

Busy people everywhere need Time-trax. Keep schedules for one, ten or a hundred users. Written in



machine language with hi-res graphics all routines are very fast and the display is extremely sharp.

CPU

Creative
Peripherals
Unlimited, Inc.
1606 S. Clementine
Anaheim, CA 92802
(714) 535-1155

CIRCLE 111 ON READER SERVICE CARD

SPECIAL OFFER
FREE CLOCK MODULE INCLUDED*

11:31³⁷ AM Friday, September 30, 1983

Time-trax comes complete with clock module. Two AA batteries provide up to two years of back up power. Complete information and sub-routines are included for programming.

Time-trax is written for 48K Apple® *** II, II Plus and IIE.

See your local dealer for a Time-trax demo or order direct, for only **\$99.95**, by calling toll free:

800-854-8021 Nationwide
800-432-7268 California

Visa, Mastercard Welcome

TIME-TRAX™

THE TIME MANAGEMENT SYSTEM

Dealer Inquiries Invited.

*This offer expires December 31st, 1984.

**™ProDOS is a trademark of Apple Computer, Inc.

***® Apple is a registered trademark of Apple Computer, Inc.

programs in BASIC, now are often scores of pages long in any of a dozen computer languages.

The need for memory space is even more acute on some of the newer Apple machines. The Macintosh, which in its initial release had 128K of RAM, uses single programs with an operating system that alone would more than fill that space if you read it into memory all at once. Even the Lisa, which has up to a megabyte of memory, doesn't leave enough room for the entire operating system and common utilities to fit in memory at the same time.

Mass Storage As Memory Extension

Consequently, one of the principal functions of a disk-storage system is to hold sections of programs and data that are too big to fit into the computer's active memory. In this use, the diskette can act like an electromechanical ROM (read-only memory) chip, or it can act like read/write memory similar to the main RAM memory.

Reliability is particularly important because sections of the operating system or programs are read in time after time.

Both speed and reliability are important when diskettes serve this function. Speed is important because you have to wait in the middle of a task while sections of the operating system or programs load into memory. You'll probably find that if the delay is more than a second, your attention starts to wander.

Reliability is particularly important because sections of the operating system or programs are read in time after time, and any errors may cause the failure of a program and a consequent loss of data.

Unfortunately, speed and reliability tend to be inversely related, at least within any given price class. All computer designers must decide which asset to emphasize.

At Apple, the decision has always leaned toward reliability, at the cost of speed. The II family disk drives are roughly comparable in speed to other drives introduced at the same time, but more recent 5¼-inch drives find and transfer data much faster than do the

Apple drives.

Hard Disks Run Faster

The need to limit the rotation of a disk to a speed that won't cause mechanical problems affects the rate at which data can be stored or read on a floppy disk. Disk drives that use rigid platters ("hard disks") can spin their disks much more quickly than floppy disks, and they cut waiting time and allow faster data transfer, as well.

Although the Apple II family was not originally designed to use hard disks, the III, the Lisa, and the Macintosh were all created to do so—these machines can also run with floppy disks alone. The more rapid rate of data location and transfer allows software designers to make greater use of the disk without incurring unacceptable delays. The software for these machines tends to be separated into pieces, only some of which are in main memory at any given time.

Even though hard-disk drives are approximately ten times faster than floppy-disk drives, the Apple ProFile hard-disk drive appears to be slower than the hard-disk drives some other systems use. Again, much of that difference can be traced to design philosophy—a ProFile should have fewer data errors than faster disk drives do.

Enter the RAM Disk

With memory prices steadily falling, you might think that it's possible to add more and more memory to existing computers in order to catch up with the demands of at least older programs and operating systems. Unfortunately, there's usually a limit on how much main memory a processor can keep track of and on how much the software can use directly.

One solution to the memory crunch that's becoming increasingly popular is to use some RAM chip memory as a disk emulator. From the point of view of the computer, this memory mimics the operation of a disk drive, but does not involve a wait for mechanical operations. Two such boards are discussed at length in "Disks in RAM's Clothing" on page 46.

By emulating disk memory instead of main memory, RAM disks can use existing software that expects to work with disks (although sometimes you need software patches to take the lack of mechanical delay into account). Similarly, a disk controller or a special control circuit can manage the memory as a series of blocks instead of requiring the processor to keep track of each added byte.

APPLE SOFTWARE SPECIALS!

\$1.00 credit for phone orders over \$100.00

EDUCATIONAL (OUR SPECIALTY)

MATH		LIST	SPECIAL
Algebra Arcade	49.95	35.96	
CBS Add/Sub	24.95	17.96	
Dragon Mix	34.00	24.16	
Factor Blast	34.95	24.86	
Fraction Fever	34.95	24.86	
Quadrilaterals	34.95	24.86	

ENGLISH		LIST	SPECIAL
Alphabet Zoo	29.95	21.66	
Homeword	69.95	49.76	
Reader Rabbit	39.95	28.56	
Speed Reader II	69.95	49.76	
Spellicopter	39.95	28.56	
Wizard of Words	39.95	28.56	

OTHER		LIST	SPECIAL
Astro Quotes	23.95	17.22	
Game of States	39.95	28.56	
Gertrude's Secrets	44.95	32.26	
Go to Head of Class	39.95	28.56	
Goren Bridge Tutor	79.95	57.16	
S'Bear Opposites	39.95	28.56	
SAT (Barrons)	79.95	57.16	
SAT (Krell)	299.95	252.96	
Think Tank	150.00	108.96	
Trains	39.95	28.56	

Ask for FREE price list

Educators: ask for special educational catalog

HARDWARE		LIST	SPECIAL
Koala Pad	124.95	90.46	
Kraft Joystick	49.95	35.96	
RH Fan w/Zener Ray	109.00	78.66	
Replay II - (Ile)	80.00	55.00	
Wildcard 2	139.95	110.19	
Wildcard +	169.95	133.56	

MISCELLANEOUS		LIST	SPECIAL
Crypt of Medea	34.95	24.86	
D.B. Master 4.0	350.00	255.00	
Deadline	49.95	35.96	
Donkey Kong	34.95	28.76	
Ess. Data Dup (EDD)	79.95	58.16	
Flight Sim II	49.95	38.96	
GPLE	49.95	35.96	
Graphics Dept.	124.95	90.46	
Locksmith 5.0	99.95	77.96	
Micro Cookbook (II + or Ile)	40.00	28.56	
North Atlantic '86	59.95	43.36	
Oil's Well	34.95	24.86	
PFS File or Rept. (II + or Ile)	125.00	90.46	
Pro Tour Golf	39.95	28.56	
Ringside Seat	39.95	28.56	
Robotron: 2084	34.95	28.76	
Sargon III	49.95	35.96	
Sensible Speller	124.95	90.46	
Spare Change	34.95	24.86	
The Handlers	129.95	94.16	
Wizardry	49.95	35.96	



Apple is a trademark of Apple Computer, Inc.

C.O.D. • M.O. • Cert. Checks • School P.O.
 • VISA • MasterCard • Checks Allow 2 Weeks
 • N.Y.S. Res. Add Sales Tax • US Orders
 Under \$150. Add \$2.00 P & H • All Canadian,
 US Funds \$3.00 P & H • Foreign, Charges Only.
 Min. P & H \$7.00

Box 525, Dept. B
 East Setauket, N.Y. 11733
 (516) 751-2535

CIRCLE 116 ON READER SERVICE CARD

INCREASE THE VALUE OF YOUR DOLLAR

Order From Nonagon™

Hardware		SUPER SPECIALS	
CPM Card (ALS)	290.00	System Saver	62.95
CPM Card with		16 K Ram Card	49.95
T Maker (ALS)	425.00	Koala Pad	84.95
Z Card II (ALS)	129.95		
		Software	
		The Handlers (SVS)	84.95
		Word Handler (SVS)	36.95
		List Handler (SVS)	29.95
		Spell Handler (SVS)	29.95
		Format II (Kensington)	94.95
		T Maker (ALS)	209.95

APPLE GAMES		APPLE BUSINESS/UTILITIES	
Broderbund		Strategic Simulations	
Arcade Machine	59.95 41.95	Computer Baseball	39.95 27.95
Choplifter	34.95 24.95	Questron	49.95 39.95
Serpentine	34.95 24.95	Carrier Force	59.95 41.95
Seafox	29.95 20.95	Germany 1985	59.95 41.95
Gumball	29.95 20.95	North Atlantic 86	59.95 41.95
Loderunner	34.95 24.95	Geopolitique 1990	39.95 27.95
Spare Change	34.95 24.95	Knights of the Desert	39.95 27.95
AE	34.95 24.95	Ringside Seat	39.95 27.95
		Broadsides	34.95 24.95
		Eagles	39.95 27.95
Datasoft			
Zaxxon	39.95 27.95	Sublogic	
Pooyan	29.95 20.95	Night Mission Pinball	34.95 24.95
		Flight Simulator II	49.95 39.95
Epyx			
Temple of Apshai	40.00 27.95	Artsci	
Jumpman	40.00 27.95	Magic Window II	149.95 104.95
Oil Barons	99.00 69.00		
		Beagle Brothers	
Electronic Arts		Silicon Salad	29.95 21.95
Music Construction Set	39.95 31.95	Utility City	29.95 20.95
Pinball Construction	39.95 31.95	Pronto Dos	29.95 20.95
Hard Hat Mack	34.95 27.95	GPLe	49.95 39.95
Axis Assassin	39.95 31.95	Apple Mechanic	29.95 20.95
Standing Stones	39.95 31.95	Disk Quick	29.95 21.95
One on One	39.95 31.95	Tip Disk #1	29.95 20.95
Sky Fox	39.95 31.95	Beagle Basic	34.95 24.95
Archon	39.95 31.95	Alpha Plot	39.95 27.95
		Frame Up	29.95 20.95
Hadyen		BPI	
Sargon III	49.95 39.95	The Business Analyst	195.00 146.50
Infocom		Business Solutions	
Zork I, II, III	39.95 27.95	Incredible Jack	179.00 134.95
Deadline	49.95 34.95		
Starcross	39.95 27.95	Central Point	
Infidel	49.95 27.95	Copy II	39.95 31.95
Suspended	49.95 34.95		
Witness	49.95 37.50	Continental	
Planetfall	49.95 37.50	Home Accountant	74.95 52.50
Enchanter	49.95 37.50	Tax Advantage	59.95 48.95
Mind Systems		Dow Jones	
Spitfire	39.95 31.95	Market Analyzer	350.00 299.95
Air Sim III	44.95 35.95		
		Hayden	
Odesta		Applesoft Compiler Plus	99.95 69.95
Chess	69.95 49.95		
Odin	49.95 37.95	Howard	
		Tax Preparer 1984	250.00 199.95
Origin			
Ultima III	54.95 43.95	Microlab	
		Tax Manager	180.00 140.00
Penguin			
Pie Man	19.95 15.95	Microsoft	
The Coveted Mirror	19.95 15.95	Multipian (Z-80/Apple DOS)	275.00 192.50
Pensate	19.95 15.95	Multitool Fin. Statement	100.00 80.00
The Quest	19.95 15.95	Multitool Budget Analysis	150.00 112.50
Minit Man	19.95 15.95	Fortran-80 (CP/M)	195.00 157.00
Transylvania	19.95 15.95	Applesoft Compiler	175.00 137.50
Expedition Amazon	19.95 15.95		
		Micro Sparc	
Sierra-On-Line		Microsoft/Assembler	99.95 89.95
Time Zone	99.95 69.95		
Ultima II	59.95 41.95	Monogram	
Frogger	34.95 24.95	Dollars & Sense	100.00 79.95
Dark Crystal	39.95 27.95		
		Pear	
Sir-Tech		Stock Portfolio Eval. Sys	600.00 500.00
Wizardry I	49.95 34.95		
Wizardry II	34.95 24.95	Penguin	
Wizardry III	39.95 27.95	Complete Graphics System	74.95 59.95
Crypt of Medea	39.95 29.95	Graphics Magician	59.95 41.95
		Paper Graphics	49.95 37.95
		Sensible	
		Sensible Speller	124.95 87.95
		Book Ends	124.95 90.95
		Back It Up III	74.95 59.95
		Image Printer II	49.95 34.95
		Sierra-On-Line	
		Homeword	69.95 49.95
		Screenwriter Professional	199.95 139.95
		General Manager II	229.95 160.50
		Software Publishing Corp.	
		PFS-File	125.00 87.50
		PFS-Report	125.00 87.50
		PFS-Graph	125.00 87.50
		PFS-Write	125.00 87.50
		Southwestern Data	
		Munch A Bug	49.95 34.95
		Merlin	64.95 45.50
		Apple-DOC/List Master	39.95 31.95
		Printographer	49.95 34.95
		Stoneware	
		DB Master Utility #1	129.00 97.50
		DB Master Utility #2	129.00 97.50
		DB Master 4.0	350.00 262.50
		DB Master Stat Pac	129.00 97.50
		Visicalc	
		Visicalc 3.3	250.00 174.95
		Advanced Visicalc	400.00 300.00
		APPLE EDUCATION	
		CBS	
		Success with Math	24.95 19.95
		Designware	
		Spellcopter	39.95 31.95
		Math Maze	39.95 31.95
		Davidson & Associates	
		Math Blaster	49.95 39.95
		Word Attack	49.95 39.95
		Scarborough	
		Master Type	39.95 31.95
		Song Writer	39.95 31.95
		Scholastic	
		Picture Writer	39.95 31.95
		Square Pairs	39.95 31.95
		Turtle Trax	39.95 31.95
		Spinnaker	
		Story Machine	34.95 27.95
		Facemaker	34.95 27.95
		Kindercomp	29.95 23.95
		Delta Drawing	49.95 39.95
		Snooper Troops #1, #2	44.95 35.95
		Alphabet Zoo	29.95 23.95
		APPLE HARDWARE	
		Electrohome	
		Hi Res RGB Monitor	699.00 414.95
		Hayes	
		Joystick Mach III (II-)	49.95 39.95
		Joystick Mach III (Ile)	59.95 43.95
		Hayes Microcomputer	
		Micromodem II w/Term Prog	409.00 280.00
		Kraft	
		Joystick	64.95 48.95

For Mail Orders: Include your selection(s), name, address, phone number along with your check, money order or credit card number and expiration date. Please include \$3.00 for shipping & handling (heavy items, hardware and foreign orders extra). California residents add 6½% sales Tax.

ORDER DESK

National: 800-942-2058
California: 800-223-8327

Alaska & Hawaii: 415-237-4406
Hours: 8 a.m. to 6 p.m. PST



For Order Status & Technical Information Call:
415-237-5283

In Bay Area visit
SOFTWARE SOLUTIONS™

11185 San Pablo Ave, El Cerrito, CA 94530
(415) 237-5257 Hrs: M-Sat 10 a.m. to 6 p.m.

NONAGON SOFTWARE™

P.O. Box 1486

El Cerrito, CA 94530

CIRCLE 125 ON READER SERVICE CARD

When you use them as memory extensions for programs or the operating system, RAM disks provide an outstanding combination of reliability and speed. Input/output delays on most RAM disk systems are almost negligible, and the transfer rate is usually as fast as the Apple's ability to accept information.

Reliability is also good on a RAM disk, because it has no moving parts. You can read and write data as frequently as you like to the same locations, and they won't wear out—a problem with diskettes. A well-designed RAM disk board shouldn't ever lose a bit of data, unless you have an outright chip failure or other hardware problem.

A more exotic form of solid-state storage that has recently appeared for the Apple is magnetic bubble memory. Bubble memory is like a cross between magnetic-disk and RAM memory. It stores data in moving magnetic patterns in a special crystalline material. Because it has no mechanical parts, it's quite reliable, but because data resides in long loops and moves past a read/write station in each chip, access time for reading and writing can be almost as long as with a disk drive. Unlike ordinary RAM chips, bubble-memory chips return the information they store, even when you turn off the power.

No Disk Is Big Enough

For storing programs and data, speed and reliability are particularly important, but capacity is also a significant factor. Just as software always grows to overflow available main memory, the amount of data stored on disk grows ever larger.

Actually, two different measures of capacity are of concern. For storing the operating system, individual programs, and data, the most important consideration is how much data you can access at a time. For archival storage, the cost of storing large amounts of data is a more important factor.

Storage that a computer can read from or write to on command, such as on a hard disk or floppy disk in a drive, is called "secondary" storage or "passive" memory ("primary" storage or "active" memory is the memory chips that the computer can read from and write to directly). Larger amounts of secondary storage permit you to use more complex, segmented programs and larger files and to swap files quickly for multiuser systems.

The amount of data that a disk drive can store depends on the design of the disk drive and on how the data is en-

New dimensions in Bible study.

Requires APPLE II+, IBM PC and compatibles, TRS80, CP/M 2.2 (Z-80), KAYPRO, OSBORNE, COMMODORE 64, Z-100.

CIRCLE 162 ON READER SERVICE CARD

coded into bit patterns. Again, there is a trade-off between reliability and density. Denser storage allows less room for slight errors and is thus less reliable.

Apple disk controllers use an advanced encoding method known as group-code recording. As a result, the Apple Disk II drive packs 143 kilobytes into 35 tracks of a single-sided diskette; other brands hold as little as 80K in

Larger amounts of secondary storage permit you to use more complex, segmented programs and larger files.

that same space. Some other computers have now gone to double-sided, double-density disks, however, some with as many as 80 tracks per side—for as much as 800K on a 5¼-inch disk (the amount a Lisa 1 diskette holds).

Apple has chosen not to upgrade the disks for the II family yet, so you'll have to turn to other companies if you want high-capacity drives for these ma-

chines. Some of these drives mimic the operation of multiple Apple drives and can use the same controller. Others, however, are based on a slightly different drive mechanism and therefore require a special controller.

If you want more data storage, you can also turn to a hard disk. The ProFile hard-disk drive used on the Apple III and the original Lisa stores five megabytes (equivalent to about 35 diskettes), and you can connect multiple drives if you need to. The new Lisa 2 is available with a ten-megabyte internally mounted drive. Apple has recently announced that the ProFile drive will be available for the hard-disk II family, one of the company's main reasons for offering ProDos for the II.

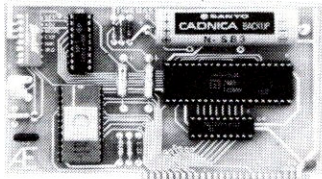
Hard-disk drives are significantly more expensive than floppy drives, but only if you are looking at total cost. If you compare cost per unit of storage, a five-megabyte disk for a few thousand dollars is still much cheaper than 35 floppy drives at a few hundred each.

Backing up data on floppy-disk drives is easy on a system with two or more drives. Apple supplies disk-copy programs for all its machines, and commercial disk-copy programs offer extra features for the Apple II family. On sin-

Apple Peripherals Are All We Make

That's Why We're So Good At It!

THE NEW TIMEMASTER II



Automatically date stamps files with PRO-DOS

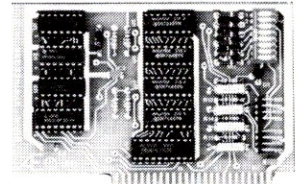
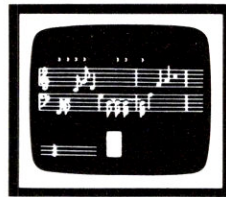
NEW 1984 DESIGN
An official PRO-DOS Clock

- Just plug it in and your programs can read the year, month, date, day, and time to 1 millisecond! The only clock with both year and ms.
- NiCad battery keeps the TIMEMASTER II running for over ten years.
- 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 TIMEMASTER to emulate other clocks, we just drop off features. That's why we can emulate others, but others CAN'T emulate us.
- The TIMEMASTER II will automatically emulate the correct clock card for the software you're using. You can also give the TIMEMASTER II a simple command to tell it which clock to emulate (but you'll like the Timemaster mode better). This is great for writing programs for those poor unfortunates that bought some other clock card.
- Basic, Machine Code, CP/M and Pascal software on 2 disks!
- Eight software controlled interrupts so you can execute two programs at the same time (many examples are included).
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.

The TIMEMASTER II includes 2 disks with some really fantastic time oriented programs (over 40) including appointment book so you'll never forget to do anything again. Enter your appointments up to a year in advance then forget them. Plus DOS dater so it will automatically add the date when disk files are created or modified. The disk is over a \$200.00 value alone—we give the software others sell. All software packages for business, data base management and communications are made to read the TIMEMASTER II. If you want the most powerful and the easiest to use clock for your Apple, you want a TIMEMASTER II.

PRICE \$129.00

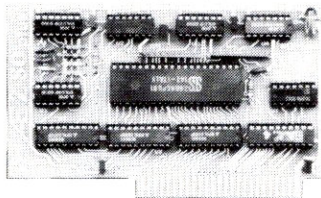
Super Music Synthesizer Improved Hardware and Software



- Complete 16 voice music synthesizer on one card. Just plug it into your Apple, connect the audio cable (supplied) to your stereo, boot the disk supplied and you are ready to input and play songs.
- It's easy to program music with our compose software. You will start right away at inputting your favorite songs. The Hi-Res screen shows what you have entered in standard sheet music format.
- Now with new improved software for the easiest and the fastest music input system available anywhere.
- We give you lots of software. In addition to Compose and Play programs, 2 disks are filled with over 30 songs ready to play.
- Easy to program in Basic to generate complex sound effects. Now your games can have explosions, phaser zaps, train whistles, death cries. You name it, this card can do it.
- Four white noise generators which are great for sound effects.
- Plays music in true stereo as well as true discrete quadraphonic.
- Full control of attack, volume, decay, sustain and release.
- Will play songs written for ALF synthesizer (ALF software will not take advantage of all our card's features. Their software sounds the same in our synthesizer.)
- Our card will play notes from 30HZ to beyond human hearing.
- Automatic shutoff on power-up or if reset is pushed.
- Many many more features.

PRICE \$159.00

Z-80 PLUS!



- TOTALLY compatible with ALL CP/M software.
- 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 WORD STAR, dBASE II, COBOL-80, FORTRAN-80, PEACHTREE and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and a low parts count allows the Z-80 Plus to fly thru CP/M programs at a very low power level. (We use the Z-80A at fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

Don't confuse the Z-80 Plus with crude copies of the microsoft card. The Z-80 Plus employs a much more sophisticated and reliable design. With the Z-80 Plus you can access the largest body of software in existence. Two computers in one and the advantages of both, all at an unbelievably low price.

PRICE \$139.00

Viewmaster 80

There used to be about a dozen 80 column cards for the Apple, now there's only ONE.

- TOTALLY Videx Compatible.
- 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 connectors.
- Both upper and lower case characters are standard.
- 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	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN HOME	7x9 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERRIDE	INVERSE CHARACTERS
VIEWMASTER	179	YES	YES	YES	YES	YES	YES	YES	YES
SUPRTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
SMARTERM	MORE	YES	YES	NO	NO	NO	YES	YES	NO
VIDEOTERM	MORE	NO	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, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

PRICE \$179.00

- Expands your Apple IIe to 192K memory.
- Provides an 80 column text display.
- Compatible with all Apple IIe 80 column and extended 80 column card software (same physical size as Apple's 64K card).
- Can be used as a solid state disk drive to make your programs run up to 20 times FASTER (the 64K configuration will act as half a drive).
- Permits your IIe to use the new double high resolution graphics.
- Automatically expands Visicalc to 95 K storage in 80 columns! The 64K config. is all that's needed, 128K can take you even higher.
- PRO-DOS will use the MemoryMaster IIe as a high speed disk drive.

MemoryMaster IIe 128K RAM Card

- Precision software disk emulation for Basic, Pascal and CP/M is available at a very low cost. NOT copy protected.
- Documentation included, we show you how to use all 192K.

If you already have Apple's 64K card, just order the MEMORYMASTER IIe with 64K and use the 64K from your old board to give you a full 128K. (The board is fully socketed so you simply plug in more chips.)

MemoryMaster IIe with 128K	\$249
Upgradeable MemoryMaster IIe with 64K	\$169
Non-Upgradeable MemoryMaster IIe with 64K	\$149

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 the APPLE IIe, II+, II+ and Franklin. The MemoryMaster IIe is IIe only. 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.**

Texas Residents Add 5% Sales Tax
Add \$10.00 If Outside U.S.A.
Dealer Inquiries Welcome

Send Check or Money Order to:
APPLIED ENGINEERING
P.O. Box 798
Carrollton, TX 75006

Call (214) 492-2027
8 a.m. to 11 p.m. 7 days a week
MasterCard, Visa & C.O.D. Welcome
No extra charge for credit cards

gle-drive machines, you can also copy diskettes by reading the information into memory, switching diskettes, and then writing the data out again on the other diskette.

Backing up a hard disk can be more difficult. Because the amount of data stored on the disk is so large, using floppies as a regular backup for entire hard disks is impractical. Some users do "selective backups," periodically recording on floppies any important files that have changed since the last time they were backed up. Some hard-disk systems from outside companies have an external-cartridge tape drive, allowing the hard disk's contents to be recorded on removable tapes or hard-disk cartridges. This setup solves this problem nicely and allows rapid, convenient, off-line memory storage.

Nonvolatile storage

Along with extending the space for current programs and data, another important function of mass-storage systems is to save data and programs when you turn the power off. Although all Apple computers do have some amount of built-in permanent memory (ROM), its main function is to get the machine running so it can read in an operating system and programs from the disk.

Any data or programs that you type into the machine are not stored in permanent memory, and the normal RAM on the computer loses its contents if you turn off the power (or if it even flickers for a fraction of a second).

When it comes to large amounts of archival storage, however, the hard-disk drive is at a disadvantage. In drives in which the disk is permanently mounted in the drive, the total amount that a hard-disk drive can store equals its on-line capacity. In contrast, you can store as much data with a floppy drive as your budget and shelf space for disks will allow. If you end up storing a lot of information (as is the case in most business uses and for dedicated game players), the cost of the diskettes will be more significant than the cost of the drive.

Removable hard-disk drives

In the last year, several companies have announced removable-cartridge hard-disk drives for the Apple. These drives offer the advantages of hard disks, along with the removability of floppies. Although costs are in flux, they seem to be higher than floppies for archival storage.

A less expensive alternative is a tape-cartridge storage device, such as The Bank from Corvus of San Jose,

BACK UP YOUR DISKS

\$79.95

EDD is the most powerful disk duplicator available for your Apple™ computer. Unlike the copycards, which only copy single load programs, EDD backs up your entire disk. EDD can back up more protected software than all other copy programs or copycards put together. Since EDD is automatic, you will no longer have to change parameters to duplicate most disks, although every parameter is fully documented in our extensive manual. We also provide updated EDD program lists.

Runs on: 48K Apple II, II plus, IIe, or III (emulation mode) with 1 or 2, 3.3 drives

ESSENTIAL DATA DUPLICATOR III™

- EDD rarely needs parameter changing
- Automatically finds the beginning of each track
- Unlike any of the Copycards, EDD backs up the entire disk, not just what is in memory
- Accurately finds "auto-sync" bytes and their lengths
- Can copy ¼ and ¾ tracks

TO ORDER OR FOR MORE INFORMATION, CALL (707) 257-2420

UTILICO MICROWARE 3777 Solano Ave., Suite 352, Napa, CA 94558

CIRCLE 190 ON READER SERVICE CARD

California (see Product News, this issue).

You can erase data that's in an Apple's memory or even on a disk drive in a twinkle of an eye. A disk can erase data as fast as it can rotate. To prevent human error or hardware failure from causing catastrophic loss, it's good practice to make a copy of any vital data and keep it "off-line"—out of the computer's direct control.

▶ It's good practice to make a copy of any vital data and keep it 'off line.'

Improved memory designs use less power than do older chips, so you can probably use some kind of battery backup. Most such systems store data only for hours or days, though—not long enough for permanent copies. In addition, this kind of backup saves only the data that was in memory when you turned the computer off, rather than all the data and programs you've entered previously.

One of the biggest advantages of diskette or tape storage, then, is its ability to retain data without power. Because the data on a diskette is stored as a magnetic pattern, even if you unplug the drive and leave the diskette sitting for years, the pattern will still remain.

Diskettes and tapes all use the so-called hysteresis effect—once a certain amount of magnetism has been applied to certain materials, the magnetic pattern stays in place until the surface is again placed in a strong magnetic field. Heat and stray magnetic fields can destroy stored patterns, which is why you're supposed to keep diskettes out of the way of electric motors, telephones, the tops of monitors, heaters, and unventilated cars in warm weather.

Magnetic bubble memories are also nonvolatile. If you want to use an Apple for an application in which disk drives might not do well (in a dusty environment, for example), a magnetic bubble memory will keep your data safe and sound even when you pull the plug.

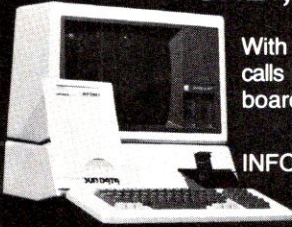
Diskettes for Software Distribution

Software is not really soft, it is ethereal—the actual instructions are like music or recipes. To be able to distribute software, you have to write it down on something, just as music or recipes

*You've seen what I can do during the day,
You should see what I can do at night.*

Your computer has the legs to do more work than you've been asking it to. Most computers in the evening are, simply, off. But now your Apple can act as the hub of a communications system.

ANNOUNCING INFONET, THE ELECTRONIC BULLETIN BOARD SYSTEM



With INFONET your computer or any other computer that calls in can have access to files, read mail, or scan bulletin board areas. Call our office with your computer and talk with INFONET any evening or weekend.

INFONET is just one of three communications products made by SUN DATA.

- INFONET - \$200 Electronic Bulletin Board
- EASYTERM - \$80 Terminal Communications
- TAP - \$129 Telephone Access Programming-language

Your legs may get tired, but you'll never hear your computer complain.

Write us for more information:
531 N. MAIN • LOGAN, UT 84321 • (801) 752-7631

(801) 752-7632 INFONET DATA LINE*

*Evenings & Weekends only — 5:00 p.m. - 8:00 a.m. MST

ORDERS: Mastercard, Visa & American Express or COD
TOLL FREE 800-821-3221

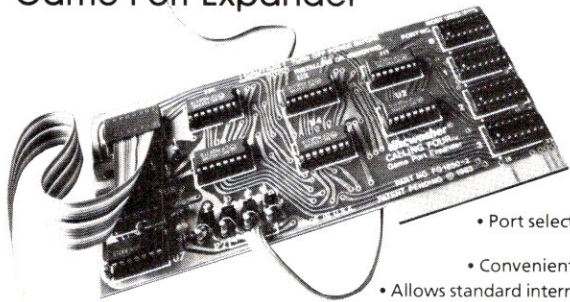


SUN DATA products work on the Apple II and the Apple III; Macintosh & Lisa versions available in summer of 1984. Apple, Macintosh & Lisa are trademarks of Apple Computer, Inc.

CIRCLE 219 ON READER SERVICE CARD

Expand 1 Apple port into 4... electronically!

discwasher[®]
Calling Four™
Game Port Expander



NOW
\$49.95

Suggested Retail \$69.95

- Individually address up to four controllers electronically
- Port selection achieved via keyboard entry or software codes
- Convenient LED indicator indicates active port
- Allows standard interrupt and DMA Daisy Chain operation

Please send me _____ Discwasher[®] Calling Four™ Game Port Expanders at \$49.95 each. (MO. residents add 4.625% sales tax). I have included a check, money order or MasterCard/Visa information for a total price of \$_____.



1001 E. Walnut
Columbia, Missouri 65201

Phone orders, call 314/875-8613

Name _____
Address _____
City _____ State _____ Zip _____
MasterCard/Visa # _____
Expiration Date _____
Signature _____

CIRCLE 317 ON READER SERVICE CARD

are written down on paper.

Some game software is distributed on cassette tape, but the vast majority of commercial software is sold as prerecorded floppy diskettes. You can buy the software, take it home, and load and run it just like a program you've written and stored on disk yourself.

Software companies' priorities for disks are different from those of users. Because software on diskettes is easy to copy, many software companies have put a lot of effort into "copy-protecting" their diskettes. Although any copy-protection scheme can be defeated with enough effort, the idea is to make copying software more difficult than it's worth for most users.

Software for Apple computers is particularly likely to be protected, because the design of the disk controllers allows more alterations of the diskette than the controller-chip designs of the IBM Personal Computer and other machines do. In addition, Apple drives can read and write between the standard track positions, spots that standard

▶ Many protection methods reduce the margin for correct reading of disks.

disk-copying programs don't copy.

Unfortunately, many protection methods reduce the margin for correct reading of disks, as does high-speed duplication of protected or unprotected software—most software companies do promise to replace disks that are defective on receipt. Fortunately, Apple's choice of greater reliability over speed or capacity helps alleviate this problem.

As for the future of mass storage for Apples, the directions are not yet clear. A higher-capacity floppy-disk drive for the Apple II family is long overdue, and even the ten-megabyte drive in the Lisa may be limiting for some uses. Macintosh hard disks are available from outside vendors such as Tecmar and Davong (see Macintosh Product News, page 104). Magnetic bubble memories may yet make a significant impact, especially if the price of the chips keeps falling. But with reports of high-capacity three-inch hard disks and four-megabit RAM chips already in development, I think you can look for more RAM disks, smaller hard disks, and larger-capacity removable disks within five years. **+**

THE WORLD'S LARGEST COMPUTER MAIL ORDER FIRM

CONROY-LA POINTE™

Formerly **Computer Exchange**

DEALERS
WE BUY
EXCESS
INVENTORIES

© 1984 by Conroy-LaPointe, Inc. All Rights Reserved

LOW PRICES TO PROFESSIONALS WHO KNOW WHAT THEY WANT AND KNOW HOW TO USE IT!

ALL MAIL: Conroy-LaPointe, Inc. 12060 Garden Place, Portland, OR 97223 SHOWROOMS AT: PORTLAND, OR or SEATTLE, WA — BOTH OPEN M-SAT 10-6

HARDWARE for your APPLE

APPLE IIe, 128K, 80 COLUMN
APPLE IIe, STARTER SYSTEM BY APPLE



APPLE MACINTOSH
LIMITED WARRANTY is 100% Parts & Labor for 90 days by us.

DISK DRIVES

Amec Amdek 1.3" Micro-Floppy, 143K	\$ 299	\$ 149
CENTRAL PT. , Filer, Utility & Apple DOS	\$ 20	\$ 15
U-SCI A2, 143K Disk Drive	\$ 479	\$ 229
A2 Controller Card	\$ 100	\$ 79
A4, 160K, Drive	\$ 449	\$ 299
A70, 286K, Drive	\$ 599	\$ 299
A40A70 Controller	\$ 100	\$ 79

1/2 HIGH DRIVES

ALPS, A40, Belt Drive, 163K	\$ 299	\$ 199
TEAC, T40, Direct Drive, 163K	\$ 349	\$ 239
TEAC, T80, Double Sided, 326K	\$ 449	\$ 329
Controller Board by ComX	\$ 110	\$ 59

Rana

Elite 1, 163K, 40 Track	\$ 379	\$ 259
Elite 2, 326K, 80 Track	\$ 649	\$ 429
Elite 3, 652K, 160 Track	\$ 849	\$ 539
Elite Controller	\$ 145	\$ 89

RAM EXPANSION

ALS, ADD RAM (II+)	16K	\$ 100	\$ 49
ComX, 80 col. +64K RAM for IIe, 1 yr. Wty.	\$ 159	\$ 99	
RAM Card, 1 yr. Wty. (II+)	16K	\$ 179	\$ 39
Microsoft, RAM Card (II+)	16K	\$ 100	\$ 69
Titan/Satum RAM Card (II+)	32K	\$ 249	\$ 169
Titan/Satum RAM Card (II+)	64K	\$ 425	\$ 299
RAM Card (II+)	128K	\$ 599	\$ 399

SOFTWARE for your APPLE

BUSINESS

Applied Soft Tech. , VersaForm	\$ 389	\$ 259
Artsci, Magic Window II	\$ 150	\$ 99
Logic Combo (Wind, Mail & Words)	\$ 225	\$ 149
Ashton-Tate , dBase II (Req CP/M 80)	\$ 700	\$ 385
Friday (Requires CP/M 80)	\$ 295	\$ 199
BPI Systems , GLARAP/PR or HW each	\$ 395	\$ 269
Broderbund , Bank St. Writer or Spell, ea.	\$ 70	\$ 45
Continental , GLARAP or PR each	\$ 250	\$ 165
Home Accountant	\$ 75	\$ 49
Tax Advantage	\$ 70	\$ 47
Dow Jones , Market Analyzer	\$ 350	\$ 275
Market Manager	\$ 300	\$ 235
Market Microscope	\$ 700	\$ 525
Fox & Geller , Quickcode or dGraph, ea.	\$ 295	\$ 185
dUtility for dBase II	\$ 99	\$ 66
Hayden , Pie Writer (Specify 80 col. bd)	\$ 150	\$ 99
Howard Soft , Tax Preparer, 1984	\$ 250	\$ 185
LJK, Letter Perfect w/Mail Merge	\$ 150	\$ 99
Micro Pro , (all require Z80-CP/M Card)	\$ 495	\$ 295
WordStar w/applicard 80P/M SPECIAL	\$ 495	\$ 295
InfoStar w/applicard 80P/M SPECIAL	\$ 495	\$ 239
WordStar™ — Training Manual SPECIAL	\$ 495	\$ 239
SpellStar™ or MailMerge™, ea. SPECIAL	\$ 250	\$ 129
WordStar Professional 4 Pak SPECIAL	\$ 895	\$ 395
Options Pak, SS/MM/SI	\$ 295	\$ 175
Microsoft , Multi-Plan (CP/M or Apple DOS)	\$ 250	\$ 169
Osborne/ComX , (Disk and Book) (Stat., Bus. & Math)	\$ 100	\$ 49
Some Common Basic Programs (75 ea.)	\$ 100	\$ 49
Practical Basic Programs (40 ea.)	\$ 100	\$ 49
Peachtree , Requires CP/M & MBasic, 64K		
Series 40 GL & AR & AP, all 3	\$ 395	\$ 239
Perfect Writer/Speller-2 pak	\$ 399	\$ 249
Perfect Writer or Perfect Calc, each	\$ 249	\$ 149
Perfect Writer/Speller/Writer/Calc (4)	\$ 969	\$ 499
Pearlco , Personal Pearl	\$ 295	\$ 195
Quark , Word Juggler & Leascheck (IIe)	\$ 189	\$ 139
Sensible , Sen. Speller or Bookends, ea.	\$ 125	\$ 85
Sierra/On-Line , ScreenWriter Pro, 2 Pak	\$ 200	\$ 135
ScreenWriter II	\$ 130	\$ 89
The Dictionary NEW!	\$ 100	\$ 69
Gen. Manager II-NEW!	\$ 230	\$ 155
Homework	\$ 50	\$ 34
Silicon Valley , Word Handler	\$ 60	\$ 39
List Handler	\$ 50	\$ 35
Handler Pak (Word, List & Spell)	\$ 130	\$ 89
Software Publishing , PFS: File	\$ 125	\$ 84
(Specify + or e)	\$ 125	\$ 84
PFS: Report	\$ 125	\$ 84
PFS: Graph	\$ 125	\$ 84
PFS: Write (IIe)	\$ 120	\$ 79
Stoneware , DB Master Version 4.0	\$ 250	\$ 229
DB Utility I or II	\$ 129	\$ 87
Advanced DB Master	\$ 595	\$ 495

VisiCorp , Visicalc 3.3 (II+)	\$ 250	\$ 169
Visicalc Enhanced (IIe)	\$ 250	\$ 179
Visicalc Advanced (IIe)	\$ 295	\$ 210
VisiFile or VisiDex, each	\$ 250	\$ 179

UTILITY & SYSTEM

Beagle , Apple Mechanic or Diskquik, ea.	\$ 30	\$ 22
Double-Take or GPLE, each	\$ 35	\$ 25
Typefaces (Req. Ap. Mechanic)	\$ 20	\$ 15
DOSS Boss or Utility City, each	\$ 30	\$ 22
Tip Disk #1	\$ 20	\$ 15
Pronto DOSS	\$ 30	\$ 20
Alpha Plot	\$ 40	\$ 27
Central Point , Filer, DOS 3.3 & Util.	\$ 20	\$ 15
Copy II Plus (bt copier)	\$ 40	\$ 30
Einstein , Compiler—AppleSoft BASIC	\$ 129	\$ 85
Epson , Graphics Dump	\$ 15	\$ 9
Hayes , Terminal Prog (SM or MM, ea.)	\$ 100	\$ 65
Insoft , GrafFORTH by Paul Lutus	\$ 175	\$ 59
Microsoft , A.L.D.S.	\$ 125	\$ 85
Fortran 80	\$ 195	\$ 135

COMPLETE MICROSOFT LINE IN STOCK

Omega , Locksmith (bt copier) Ver 5.0	\$ 100	\$ 75
Penguin , Complete Graphics System II	\$ -70	\$ 53
Graphics Magician	\$ 60	\$ 41
Phoenix , Zoom Grafik	\$ 40	\$ 34
Utility, Bag of Tricks	\$ 40	\$ 29
Terrapin , Logo	\$ 150	\$ 99
Utilico , Essential Data Duplicator III	\$ 80	\$ 49

HOME & EDUCATIONAL

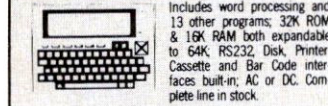
Atari , Centpede, PacMan or Donkey K, ea.	\$ 35	\$ 28
Beagle Bros. , Beagle Bag	\$ 30	\$ 22
Bluechip , Millionaire	\$ 60	\$ 40
Broderbund , Chopfiter or Lode Runner, ea.	\$ 35	\$ 25
Arcade Machine	\$ 60	\$ 40
Apple Panic	\$ 30	\$ 21
BudgeCo. , Pinball Constr. Set	\$ 40	\$ 27
Continental , Home Accountant	\$ 75	\$ 49
Danscof , Aztec or Zaxxon, each	\$ 40	\$ 27
Davidson , Math Blaster!	\$ 50	\$ 34
Edu-Ware , (Large Inventory)	\$ 35	\$ 29
Hayden , Sargon II (Chess)	\$ 35	\$ 29
Sargon III (Chess)	\$ 50	\$ 34
Infocom , Zork I, II, III, or Starcross, each	\$ 40	\$ 27
Koala , Full line in stock, CALL	Call	
Learning Co. , (Large Inventory)	Call	
Micro Lab , Miner 2049er	\$ 40	\$ 27
Microsoft , Typing Tutor	\$ 25	\$ 17
Monogram , Dollars and Cents	\$ 100	\$ 69
Origin , Ultima II	\$ 60	\$ 40
Sierra/On-Line , Ultima III	\$ 40	\$ 27
Sir-Tech , Wizardry	\$ 50	\$ 39
Spinnaker , Kindercomp (others in stock)	\$ 30	\$ 20
Sub Logic , Flight Simulator II	\$ 50	\$ 37

OVERSTOCK SPECIALS

WHILE THEY LAST

CORVUS 6 Meg \$2095	\$1495
20 Meg \$3750	\$2895
IBM-PC Bank, 20 Meg Backup	\$2150
IBM-PC Dmm Transporter, 4 Pak	SPECIAL \$1895
CCS , Serial Interface 7710 (Set Baud)	\$ 150
ComX , 16K RAM Card, 1 yr. Wty. for II+	\$ 179
80 col. +64K RAM for IIe, 1 yr. Wty.	\$ 199
Silicon Valley , List Handler	\$ 60
Word Handler	\$ 30
Handler Pak (Word, List & Spell)	\$ 130
Videx , Videoterm, 80 column card for II+	\$ 345

NEC PC-8201A \$649



Includes word processing and 13 other programs; 32K ROM & 16K RAM both expandable to 64K; RS232, Disk, Printer, Cassette and Bar Code interfaces built-in; AC or DC. Complete line in stock.

Computer, PC8201A, 16K (64K)	\$ 800	\$ 649
Data Recorder, PC8201A	\$ 115	\$ 99
Printer, PC8221A Thermal, 40 col.	\$ 170	\$ 149

★ MEANS A BEST BUY

MONITORS

AMDEK , 12" Green, #300G	\$ 200	\$ 135
12" Amber, #300A	\$ 210	\$ 140
12" Amber, #310A for IBM-PC	\$ 230	\$ 169
13" Color I, Composite	\$ 379	\$ 289
13" Color II, RGB, Hi Res	\$ 529	\$ 439
13" Color IV, RGB, 720x400	\$ 150	\$ 109
NEC , 12" Green, Model 1260MA	\$ 199	\$ 149
12" Green, Model 1201MA	\$ 199	\$ 149
12" Amber, Model 1205MA	\$ 210	\$ 159
12" Color, RGB, 1216 FA (IBM&NEC-PC)	\$ 599	\$ 449
12" Color, Composite, 1215A (Apple)	\$ 399	\$ 299
PRINCETON , RGB Hi Res, HX-12	\$ 795	\$ 499
RGB Hi Res, SR-12	\$ 799	\$ 499
Amber, MAX-12 (Mono Brd.)	\$ 249	\$ 149
QUADRAM , Quadchrome 12" RGB Color	\$ 695	\$ 495
Quadscreen 17" 96x512	\$ 1995	\$ 1495
ZENITH , 12" Green, Mdl ZVM123 NEW!	\$ 200	\$ 99
12" Amber, ZVM124 (IBM-PC)	\$ 200	\$ 115

MODEMS AND ACCESSORIES

ANCHOR , Signalmn MK I (RS232)	\$ 99	\$ 75
Signalmn Mark XII	\$ 399	\$ 269
HAYES , IBM-PC Smartmodem 1200B	\$ 599	\$ 439
IBM-PC Smartmodem II Software	\$ 149	\$ 109
IBM-PC to Modem Cable	\$ 39	\$ 29
NOVATION IBM-PC Access 1-2-3 Package	\$ 595	\$ 445

PRINTERS AND ACCESSORIES

DOT MATRIX:	LIST PRICE	OUR PRICE
EPSON , RX80, 100 cps	\$ 399	\$ 299
FX80, 160 cps	\$ 699	\$ 549
FX100, 160 cps	\$ 895	\$ 739
MX1000/7, 80cps, w/Graftrax+	\$ 995	\$ 545
Apple II Graphics Dump	\$ 15	\$ 9
MANNESMANN 160L, 80 col, 160cps	\$ 798	\$ 568
TALLY , 180L, 132col, 160cps	\$ 1098	\$ 778
Spirit, 80 col 80cps	\$ 399	\$ 299
NEC , PC-8023A, FT, 120cps, 80col, para	\$ 599	\$ 439
PC-8025, 120cps, 136 col, para	\$ 895	\$ 775
Cable, 8023/8025 to IBM-PC	\$ 50	\$ 40
OKIDATA , 82A, 80 col, 120 cps, para.	\$ 349	Call
83A, 132 col, 120 cps, para.	\$ 749	Call
92, 80 col, 160 cps, para.	\$ 599	Call
93, 136 col, 160 cps, para.	\$ 999	Call
2350P, Pacemarc, 350cps, para	\$ 2695	Call
2410P, Pacemarc, 350cps, para.	\$ 2995	Call
ORANGE MICRO , Grappier+, for Apple	\$ 165	\$ 119
PRACTICAL , Microbuff In-Line 64K Ser.	\$ 349	\$ 259
Microbuff In-Line 64K Ser.	\$ 349	\$ 259
QUADRAM , Quadjet, Jet Color Printer	Call	Call
STAR MIC. , Gemini 107X, 120cps, 2.3K	\$ 499	\$ 289
Gemini 157X, 120cps, 2.3K	\$ 549	\$ 439

SUPPLIES: Tractor Feed Paper, Ribbons, Daisy Wheels.

DISKETTES

CDC , 100 ea SS/DD, 40T (Apple, IBM)	\$ 550	\$ 239
10 ea SS/DD, 40T (Apple, IBM)	\$ 55	\$ 26
100 ea DS/DD, 40T (IBM, H/P)	\$ 750	\$ 295
10 ea DS/DD, 40T (IBM, H/P)	\$ 75	\$ 35
DYSAN , 10 ea SS/SD (Apple, etc.)	\$ 69	\$ 39
10 ea DS/DD 48T (IBM/H/P/etc)	\$ 89	\$ 49
MAXELL , 10 each, MD1, SS/DD	\$ 55	\$ 29
10 each, MD2, DS/DD	\$ 75	\$ 39
VERBATIM , 10 ea MD2/5-01, SS/DD	\$ 49	\$ 25
10 ea MD3A, DS/DD	\$ 84	\$ 35

GENERIK™ DISKETTES — AS LOW AS \$1

W/Jackets, no labels, top quality, 90 day limited warranty by us.

10 ea SS/SD, 35 Track (Apple, Atari)	\$ 45	\$ 17
100 ea SS/SD, 35 Track (Apple, Atari)	\$ 75	\$ 43
1000 ea SS/SD, 35 Track (Apple, Atari)	\$4150	\$995
10 ea DS/DD, 48TPI (IBM, H/P)	\$ 63	\$ 25
100 ea DS/DD, 48TPI (IBM, H/P)	\$ 626	\$ 170
1000 ea DS/DD, 48TPI (IBM, H/P)	\$6260	\$1400

NO HASSLE MONEY BACK GUARANTEE ON GENERIK'S

GENERIK™ DISKETTES

Each at 1000 quantity.

SS SD \$1.00 Each

DS DD \$1.40 Each

© 1983 by ComX Corp.

ORDERING INFORMATION AND TERMS: MAIL TO: 12060 Garden Place, Portland, OR 97223. Includes telephone number and double check your figures for SI&H. All items usually in stock. Cashiers Checks, Money Orders, Fortune 1000 Checks and Government Checks, we immediately honor. Personal or other Company Checks allow 20 days to clear. No C.O.D. Prices reflect a 3% cash discount so add 3% to above prices for VISA or MC. For U.S. Mainland, add 3% (55 minimum) for shipping, insurance and handling (SI&H) by UPS. UPS ground is standard so add 3% (10.00 minimum) more for UPS Blue for SI&H add 12% total (\$15 minimum) for SI&H for US Postal, APO or FPO. For Hawaii, Alaska and Canada, UPS is in some areas only, all others are Postal so call, write, or specify Postal. Foreign orders except Canada for SI&H add 18% or \$25 minimum for SI&H except for monitors add 30% or \$50 minimum for SI&H. Prices subject to change, typo errors and availability so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices and our assurance that you will get new unused products, ALL SALES ARE FINAL. Call before return. No goods for repair or replacement. Orders received with insufficient SI&H charges will be refunded. ORDER DESK HOURS: 6 A.M. to 6 P.M. PST Monday through Friday and 10 to 4 Saturday, 6 A.M. here is 9 A.M. in New York.

OUR REFERENCES: We have been in computers and electronics since 1958, a computer dealer since 1978 and in computer mail order since 1980. Banks, 1st Interstate Bank, (503) 643-4678. We belong to the Chamber of Commerce (503) 644-0123, Better Business Bureau and Direct Marketing Association, or call Dunn and Bradstreet if you are a subscriber. "Fasttrak" and "Generik" are trademarks of ComX Corporation.

CASH & CARRY OUTLET: Over-the-counter sales only. Open Monday through Friday, 10:00 until 6:00 Saturday, 10:00 until 6:00. PORTLAND, OREGON, NEW LOCATION! at Park 217, Tigard at intersection of 217 and 99th. Coming from Portland on 99th, take immediate left after 217 overpass and Texaco Station. Call 545-1020. SEATTLE, WASH., 3540 128th Ave. SE, Bellevue, WA 98006. Tel: 641-4736 in Lohmann's Plaza near Factoria Square, SE of Hwy 405 & 90 and at SE 38th & Richards.

OUR AD #A4

VISA

master charge

NO SALES TAX

NATIONAL ORDER DESK TOLL FREE (800) 547-1289

Order Desk Hours: 6AM to 6PM PST

Oregon TOLL FREE (800) 451-5151

Hot Line For Information On Your Order (503) 620-9877

FREE GIFT

Use of our order forms qualifies you for a free gift with your order. Get on our mailing list now for order forms, and our new newsletter and sales specials announcement. Our customers are already on our list.

COUPON

MAIL TO: 12060 Garden Place, Portland, OR 97223

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

MAIL TO: 12060 Garden Place, Portland, OR 97223

NAME _____

Isn't It Worth \$198 To Protect Your Computer?



data defender™ SECURITY SYSTEM

The Data Defender. It can protect up to ten units from being stolen. Just place your computer or any component on our pressure sensitive mat. If the circuit is broken, the alarm will sound.

The tamper resistant Data Defender works with standard wall outlets, has a battery backup and can only be accessed by you.

All this protection is at a price you can afford.

A lot of time is spent writing codes to protect your information. Now it's time to protect your computer.

Call Picotronics at 1-800-431-5007 to order your Data Defender today.



Designed by

PICOtronics, Inc.

820 East 47th B-10
Tucson, Arizona 85713

CIRCLE 117 ON READER SERVICE CARD

M A C H I N E

L A N G U A G E

► MASS STORAGE BY STEVE ROSENTHAL

A short glossary of mass memory storage

ACCESS TIME—the amount of time between when a computer asks for data from the disk (or needs to write to it) and when the data can be transferred. It's the time the head takes to move in or out to the correct track (the seek time) plus the time for the right spot on the diskette to appear under the read/write head (the rotational delay). Typical times for Apple-family drives are under half a second. Hard disks have faster access times because their disks turn faster than floppies, and their heads move to the right track more quickly.

ANSI DRIVE—a disk drive with interfaces and specifications that meet an industry standard based on the original Shugart 8-inch and 5¼-inch drives. Apple drives are nonstandard. ANSI drives can work with Apples only with special controllers.

BOOT—to start up DOS by reading it in from a diskette. DOS is not built into the permanent (ROM) memory, so you must read in a new copy after you've turned off the Apple. Similarly, the III must read in ProDOS, and the Lisa and the Macintosh must read in parts of their operating systems from disk.

BOOT DRIVE—the drive that the computer reads when you reset it or first turn it on to find a copy of the operating system. On an Apple II, it's normally drive 1 connected to the controller in slot 6.

BUBBLE MEMORY—a type of memory that stores data as patterns of magnetization on tiny crystalline chips. Bubble memories have no mechanical parts, so they're small and reliable, but they're slower than regular semiconductor memory. Like diskettes, bubbles retain data even when you turn the power off. You can buy bubble-memory cards for Apples.

CONSTANT ANGULAR VELOCITY (CAV)—the way most computers other than Apples store data on diskettes. The diskettes always rotate at the same speed, and the same amount of data is written on each track. This method

crowds the data on the inner tracks closer together, increasing the chance of errors. Apples use constant linear velocity.

CONSTANT LINEAR VELOCITY (CLV)—the way Apple computers store data on diskettes. With this method, the rotation rate of the disk changes as the head moves in and out, so data on the longer outer tracks has just as much space as data on the shorter inner tracks. Although this approach requires more complexity in the control circuits, it makes the recording process more reliable.

CONTROLLER—the card that translates commands and data from the Apple into signals for the disk drive. Apple controllers use custom circuits instead of the controller chips most other computers use, which gives the software and hardware better control of the drive.

DEFAULT DRIVE—the drive in which read and write operations take place if you don't supply a drive number in a command. In DOS, it starts out as drive 1 and is normally the last drive you've referred to.

DMA—an abbreviation for *direct memory access*, the ability of a disk controller or other card to transfer data to and from memory without sending it through the CPU chip. Some hard-disk controllers use DMA and can transfer data as fast as the memory chips in the Apple allow (about ten times as fast as a floppy-disk drive).

DOUBLE-DENSITY—a method of recording on a diskette or tape using some of the bit positions that are otherwise used for clock (timing) pulses for data. It allows a diskette to hold twice as much data as usual. Standard Apple diskettes don't use this method.

DOUBLE-HEADED—disk drives that write on the top as well as on the bottom side of diskettes. Standard Apple drives are single-headed.

GROUP-CODE RECORDING (GCR)—a method of storing data on diskettes or tape in which small groups of bits are stored instead of each bit by itself. This saves on space needed for timing and other synchronizing pulses, but does require additional software or hardware to translate strings of bits to groups. Apple disk drives use GCR.

HALF TRACK—a position between the normal 35 concentric magnetic circle patterns where Apple disk drives normally store data. Because the Apple can control the drive's stepper motor directly, it can have the head positioned between tracks. Recording on the half tracks is one component of many copy-protection methods.

HARD DISK—a disk that uses a rigid platter rather than the bendable coated Mylar of floppy disks. Most hard disks rotate faster than floppy disks and "fly" the head slightly above the disk surface instead of letting it touch the disk, allowing them to transfer data faster.

HARD-SECTORED—disks that use extra holes around the inner ring or outer track to keep track of where information is stored. Apple products use soft-sectored disks.

HELLO PROGRAM—a program on a DOS diskette that automatically runs when you boot the diskette. The program doesn't actually have to be named HELLO, but that's the common practice. The INIT program puts the HELLO program on a diskette or at least reserves space for it.

MASTER DISKETTES—diskettes that have a copy of DOS in a form that Apples with any amount of memory can use (DOS in self-relocating form).

PREBOOT—a special program that tells an Apple how to read a nonstandard disk or how to use unusual peripherals. You run the preboot and then boot the nonstandard disk. Many copy-protected software packages require a preboot for use on hard disks or with special display cards.

RAM DISK—a block of chip memory that simulates the operation of a disk drive. Because you don't have to wait for mechanical operations, you can store data away or retrieve it from a RAM disk in most applications significantly faster than with a floppy or even hard disk.

SECTOR—a unit of disk space within a track; in Apple DOS it is equivalent to 256 bytes. The current versions of DOS for the II have 16 sectors in each track. Older versions of DOS placed only 13 sectors in each track.

SEEK—to have the disk drive move the read/write head to the track the Apple

**TOP QUALITY
APPLE COMPATIBLE**

\$175

**DISK
DRIVES**

Standard Height Apple Compatible.....\$175
High Quality Half Height Apple Compatible.....\$185
AP-100-A 2-in-1.....\$469
AP-100-B Full Height.....\$239
AP-100-C Slim Line.....\$239
Atlas 8 Direct Drive.....\$199

HARDWARE FOR APPLE		LIST PRICE	OUR PRICE			LIST PRICE	OUR PRICE
Controller Card (dual)	\$ 79	\$ 45		MICROSOFT			
16K Ram Card	79	42		Softcard	345	239	
Z-80 Card	185	69		Softcard Premium System	695	485	
80 Column Card	229	85		Premium Softcard IIe	495	369	
Cooling Fan w/Surge Protection and Dual Outlets	69	39		Softcard Plus System	645	449	
Joystick	49	29		MICROTEK			
Computer Case Similar to II+	149	59		Dumping-GX	159	109	
Replacement Keyboard	149	69		64K Ram Card	379	152	
Case w/Numerical Keys	329	169		128K Ram Card	479	219	
Switching Power Supply	110	64		MOUNTAIN COMPUTER INC.			
RS 232 Card	159	69		Music System w/Software	395	299	
Parallel Printer Card w/Cable	149	55		The Clock	280	219	
Power Strip w/Surge Protection 6 Outlets	59	23		ORANGE MICRO			
ADVANCED LOGIC SYSTEMS				Grappler +	175	119	
Dispatcher	139	129		Buffered Grappler +	239	169	
CPM Card	399	309		Bufferboard	175	139	
Z Card II	169	139		PERSONAL COMPUTER PRODUCTS			
Smartterm II	179	149		Appli-Card 4MHz/64K Memory	295	225	
CALIFORNIA COMPUTER SYSTEMS				Appli-Card 6MHz/64K Memory	375	285	
Clock/Calendar	120	95		PRACTICAL PERIPHERALS			
CORVUS				16K Micro Buffer II	199	149	
6 Meg. Disk System	2,195	1,689		32K Micro Buffer II	219	165	
11 Meg. Disk System	2,995	2,289		SWEET MICRO SYSTEMS			
20 Meg. Disk System	3,995	2,995		Mockingboard	124.95	92	
DAN PAYMAR/ENHANCEWARE				SYNETIX SYSTEMS			
LCA-1	37.50	35		Supersprite w/3 Diskettes	454.95	319	
LCA-2	27.50	24		TITAN SYSTEMS			
EASTSIDE SOFTWARE				32K Ram Card	219	165	
Wildcard	109.95	89		64K Ram Card	34	259	
Wildcard II	139.95	105		64K Ram + 80 Col Accelerator II	249	189	
ELECTRONIC PROTECTION DEVICES				599	459		
The Lime	89.50	72		VIDEX			
The Orange	139.95	105		Ulraterm	379	269	
ENTER COMPUTER				Videoterm	279	195	
Sweet-P Plotter	695	479		80 Col + Soft Switch	309	239	
INNOVATIVE CONCEPTS				Enhancer II	149	115	
Flip 'n File	29.95	23		Function Strip	79	65	
Flip 'n File 50	39.95	29		Visicalc Preboot	49	39	
KENSINGTON MICROWARE				PRINTERS			
System Saver Fan	89.95	69		Call for prices on Diablo, IDS and NEC			
KOALA TECHNOLOGIES				BROTHER			
Koala Pad w/Micro Illustrator	124.95	79		HR-15P	599	459	
KRAFT				HR-25P	995	749	
Joystick	64.95	49		MANNESMAN TALLY			
Paddles	49.95	39		Spirit 80	399	299	
				MT-160L	798	609	
				MT-180L	1,098	845	
				OKIDATA			
				Microline 82A	\$ 549	\$ 349	
				Microline 92P	699	479	
				STAR MICRONICS			
				Gemini 10X	399	279	
				Gemini 15X	549	419	
				10X 4K Serial	119	95	
				10X 4K Buffer	99	89	
				TOSHIBA			
				P1350 w/Parallel Interface	2,195	1,599	
				TRANSTAR			
				T315 Color Printer	599	485	
				PICS Apple Interface	119.95	95	
				120P	599	489	
				MONITORS			
				AMDEK			
				V300 12" Green	179	142	
				V300A 12" Amber	199	152	
				Color I+	399	305	
				Color II+	559	435	
				NEC			
				JB 1260 12" Green	149.95	115	
				JB 1205M (A) 12"	210	169	
				SANYO			
				12" Hi Res Green	145	109	
				9" Hi Res Green	175	139	
				13" Med Res Color	795	649	
				TAXAN			
				12" Amber	190	135	
				12" Green	180	125	
				RGB Vision I	399	315	
				RGB Vision III	699	499	
				MODEMS			
				HAYES			
				Smartmodem 1200	699	489	
				Micromodem IIe (New)	329	249	
				Smartcom I (Apple)	119	89	
				Chronograph	249	199	
				NOVATION			
				CAT Acoustic 300	189	149	
				J-CAT	149	109	
				103 Smart CAT	249	169	
				103/212 Smart CAT	595	396	
				212 Auto CAT	695	549	
				Apple CAT II	389	249	
				212 Apple CAT Upgrade Kit	389	315	
				SOFTWARE			
				Please call for current listing			

requests. In most cases, the computer then checks that the magnetic track pattern on the disk indicates that the requested track was found. If it wasn't, the Apple tries again, emitting a grinding sound—if several retries fail, the Apple reports an "I/O error."

SOFT-SECTORED—disks that keep track of where each sector of data in a track starts by using special magnetic patterns instead of by looking for punched holes around the inner or outer rings of the disk. The one timing hole marks the start of the track. Apples use soft-sectored disks.

STEPPER—the special motor that moves the read/write head on the disk drive toward the center or outside of a disk. On Apple computers, the stepper is directly controlled by the processor.

TRACK—one of the concentric magnetic patterns written on a disk during formatting. Standard Apple drives put 35 tracks on each disk, but you can buy other 5¼-inch floppy drives that use as many as 80 and hard disks with hundreds.

TRACK-TO-TRACK ACCESS TIME—the time needed for the read/write head to move from one track to the next. Shorter times mean the drive can get at data faster, especially if it is scattered over the disk. In most cases, it is the longest part of the delay in accessing information on the disk.

WINCHESTER—a type of hard-disk drive, based on technology first used in an IBM disk drive with that code name. Winchester drives use a rigid disk and "fly" the head very close to the surface. To prevent small dirt particles from causing the head to touch the disk surface, Winchesters keep the head and disk within a closed chamber and filter the air that gets in. The Apple ProFile is a Winchester disk, as are most add-on hard disks for the Apple II.

WRITE-ENABLE NOTCH—a slot in the diskette jacket that signals the Apple that it is OK to write on that diskette. If the slot is covered, the computer considers the disk to be protected and will not write on it. Note that on 8-inch disks, the method is reversed—if the notch is open, the disk is protected.

WRITE-PROTECT—to mark a diskette so the Apple won't write or change any information on it. On Apple IIs, you cover the write-enable notch with an opaque label called a write-protect tab. On the Lisa and Macintosh, you slide a small plastic square out of the window in the corner of the disk case.

FREE SHIPPING To order or for **FREE** catalog, phone **312-355-9726** **FREE SHIPPING**

If you don't see what you need, call us...we probably have it.

We accept check, money order, **VISA** or **Mastercard** (include # and expiration date). Please add 2% for credit card purchase. Illinois residents add 6.25% sales tax. Personal and company checks allow 2 weeks to clear. Prices subject to change without notice. Free shipping applies only to Continental U.S.

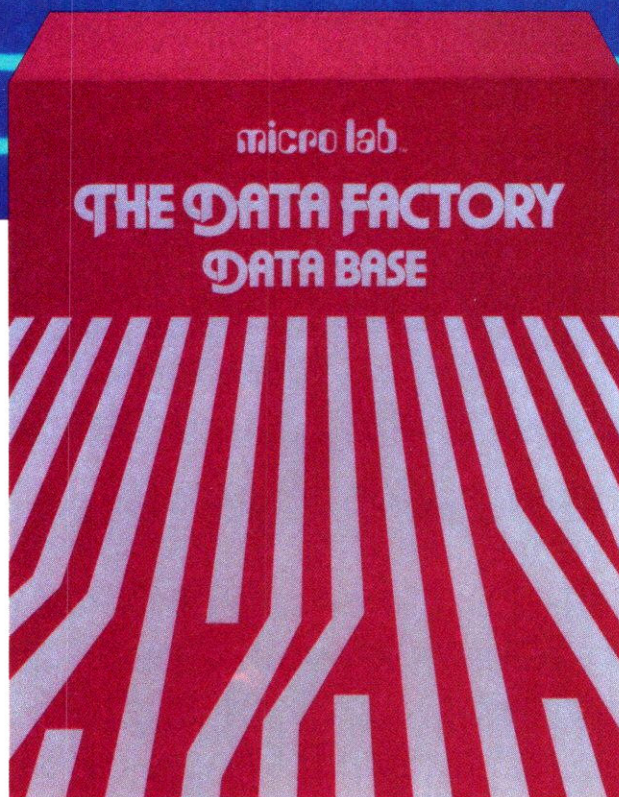


MICRO CITY
P.O. Box 571 • Downers Grove, IL 60515



THE ONLY DATA BASE YOU'LL EVER NEED

THE DATA FACTORY™



It's Easy

The Data Factory has easy-to-follow, illustrated instructions. Within the hour you can be setting up your own files. Quickly search through your records for any specific file you want. Easily sort them alphabetically... numerically... or by date. Then you can print out the information in any sequence you need. And, only The Data Factory will do all this for you so fast, so easily and with so much flexibility.

Truly, the finest introduction to electronic data management you can find.

It's Powerful

As your needs expand you'll find that The Data Factory is a fast, powerful program that can easily handle the most complex data management demands.

It searches up to 88 levels simultaneously.

Sorts thousands of records in just seconds. Performs mathematical functions. Offers AND, OR, =, <, >, <>, and date selection criteria. Customizes printouts to any format. And, The Data Factory lets you add, delete or restructure fields without any time consuming data re-entry.

It's the only data base you'll ever need!

For Apple II, IIe and IBM.

Data Factory, Apple II, IIe and IBM are registered trademarks of MicroLab, Inc., Apple Computer, Inc., and IBM Corporation, respectively.

micro lab™
Creative computer products since 1980.

2699 Skokie Valley Road
Highland Park, IL 60035
(312) 433-7550

© MicroLab, Inc., 1984

CIRCLE 150 ON READER SERVICE CARD

Does your Apple leave you hungry?



We've got speed, performance and 3,000 new applications to satisfy that appetite.

Introducing the Digital Research CP/M Gold Card.[™] The pick of the hardware crop for your Apple[®] Computer.

Just plug it into any slot in your Apple II, II+ or IIe, and you get a new generation machine that runs CP/M Plus[™] and all those programs it could never handle before.

Impressive, but not surprising. After all, who better than the creators of CP/M[®] to perfect it for your Apple?

And if you thought your Apple was a bit slow, chew on this.

We combined CP/M Plus, the Z80B microprocessor and optional Disk Cache to push your Apple to perform up to three times faster than any of the competition.

With the speed to handle programs like dBase II[™] in half the time. And we've included CBASIC[®] so you can write customized programs.




It even boosts your monitor's CP/M output to full 80 column video. And those are just the basics.

For serious programmers we also included a macro-assembler and symbolic debugger. Explaining it all in two complete manuals.

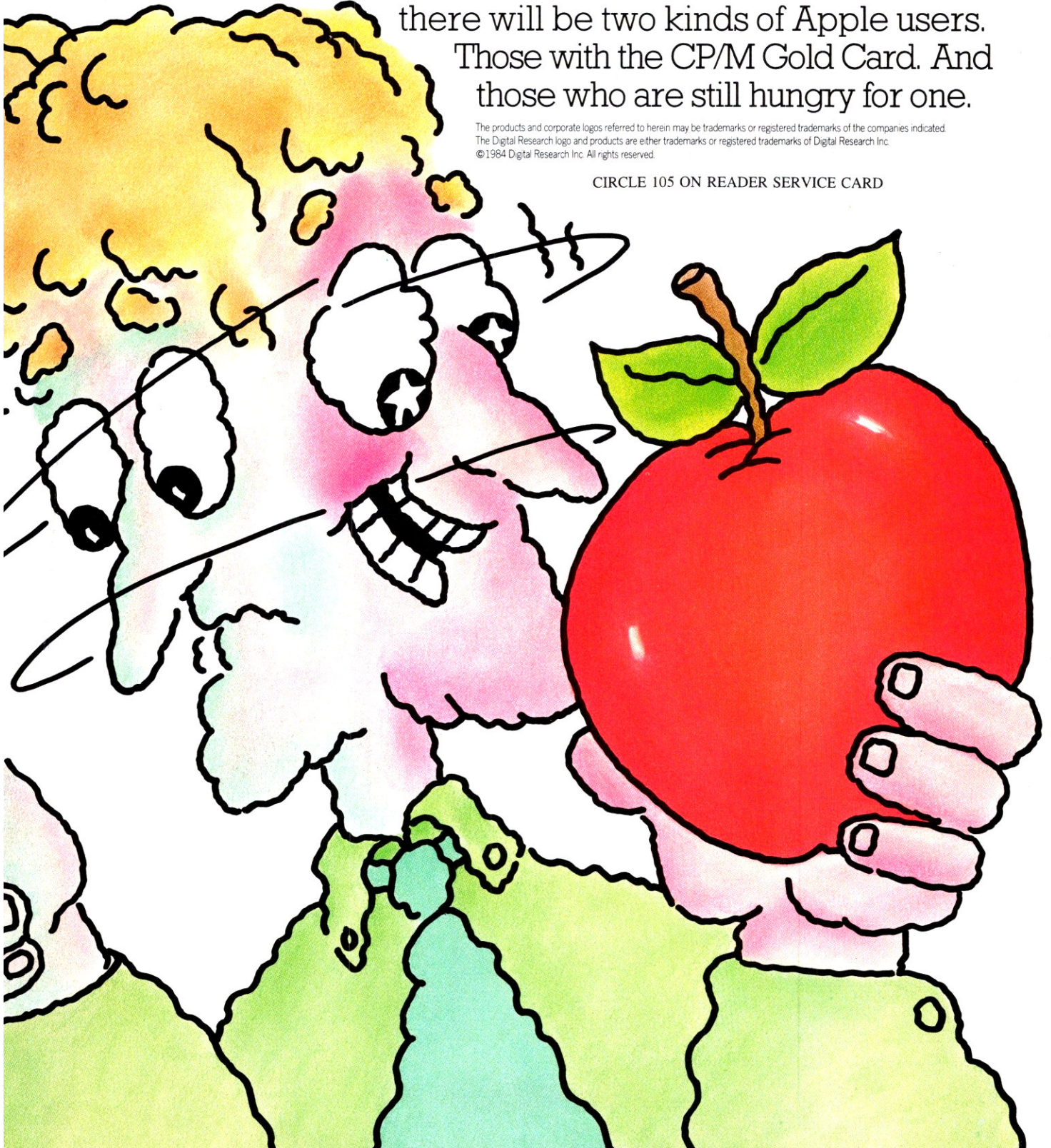
It all comes down to this. Soon

there will be two kinds of Apple users. Those with the CP/M Gold Card. And those who are still hungry for one.

 **DIGITAL
RESEARCH**[®]
We make computers work.SM

The products and corporate logos referred to herein may be trademarks or registered trademarks of the companies indicated. The Digital Research logo and products are either trademarks or registered trademarks of Digital Research Inc. ©1984 Digital Research Inc. All rights reserved.

CIRCLE 105 ON READER SERVICE CARD



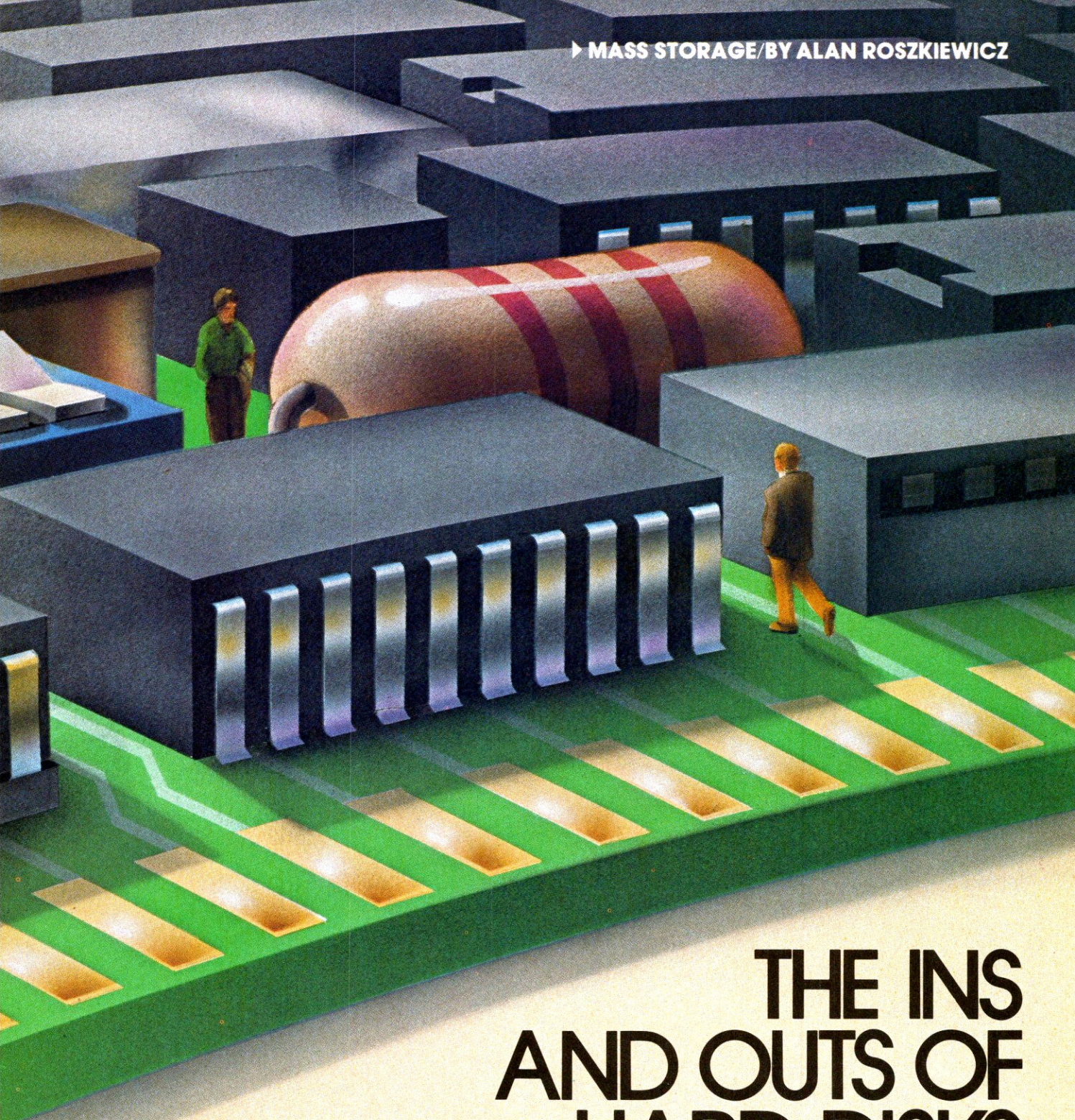


WINCHESTER

COIN HEADS

100 MEGABYTES

LANDING ZONE



THE INS AND OUTS OF HARD DISKS

Freedom from disk-swapping may now be within your reach.

If you use your Apple for any major business applications, you may soon find yourself getting tired of swapping floppy disks all the time—for everything from assembling a database mail-

ing list to running spreadsheet calculations.

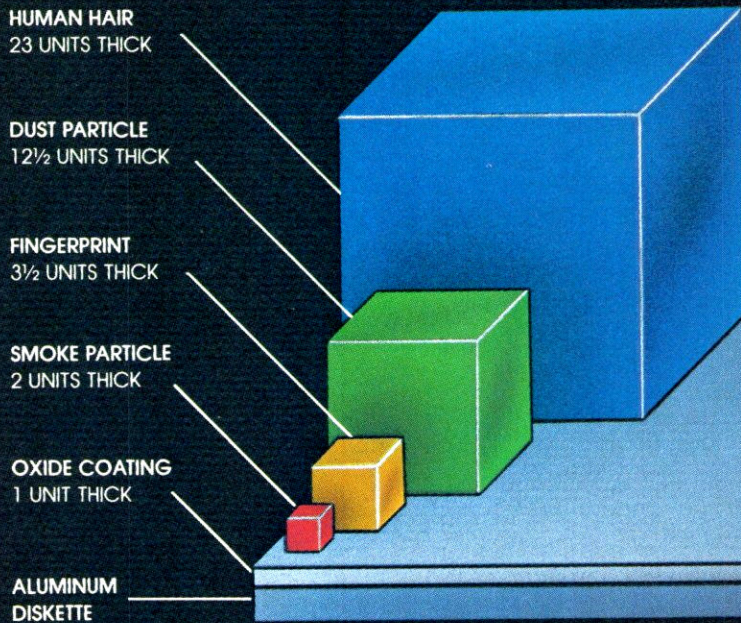
If you've found yourself with an unmanageable collection of floppies as well as a fading love affair with your computer, then read on to hear about a powerful data-storage device available for microcomputers.

Rx for a Plethora of Diskettes

A likely solution to your storage

woes may be a Winchester or hard-disk drive. These storage giants, once beyond the price range of most users, are fast becoming affordable to small-business or professional computer users. Add to this affordability the hard disk's convenience, reliability, and speed—as well as storage capacity equivalent to that of scores of on-line floppy disks—and you have the elements that make

▶ **RELATIVE SIZE OF DISKETTE CONTAMINANTS AND THE CAUSE OF "HEAD CRASHES"**



SIZE RELATIONSHIPS ARE APPROXIMATE

the hard disk a viable alternative for data storage.

A Bit of Disk History

Back in the Dark Ages, before the birth of the Apple, IBM was looking for better and more convenient ways to load data into its mainframe computers.

The computer behemoth introduced both the 8-inch floppy and the 14-inch sealed hard disk around 1973. Only three years later, the floppy-disk design, pioneered by Shugart Associates, broke onto the microcomputer scene. Since then we have seen 8-inch as well as 5¼-inch floppy-disk drives, as well as the latest generation of even smaller micro-floppy drives.

Now the same technology that went into the first hard disks or Winchester—supposedly so code-named because the original system design had a 30-megabyte fixed-disk and a 30-megabyte removable disk (30-30, as in the name of the rifle)—is reaching the consumer market. With the advent of 5¼-inch hard disks with on-line-storage capacities as large as 20 megabytes, as well as design improvements and cost reductions, the hard disk has arrived on the microcomputer scene to stay.

To give you a better idea of their capacity, a 20-megabyte system offers the equivalent of about 143 Apple 5¼-inch Disk II drives. Even if you've upgraded

▶ **HARD-DISK SUPPLIERS**

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

Automatic Resource Management
1118 East Alosta Avenue
Glendora, CA 91740
(213) 963-7213

Corona Data Systems
31324 Via Colinas, Section 110
Westlake Village, CA 91361
(800) 621-6746 or
in CA (213) 991-1144

Datamac
432 Lakeside Drive
Sunnyvale, CA 94086
(408) 720-0800

Davong Systems, Inc.
217 Humboldt Court Drive
Sunnyvale, CA 94086
(408) 734-4900

Genie Computer Corporation
31131 Via Colinas, Suite 607
Westlake Village, CA 91362
(213) 991-6210

Lobo Drives International
358 South Fairview
Goleta, CA 93117
(805) 683-1576

Micro Storage Technology
41711 Joy Road
Canton Township, MI 48187
(313) 459-3822

Mountain Computer, Inc.
300 El Pueblo Road
Scotts Valley, CA 95066
(800) 538-8157 or
in CA (408) 438-6650

Percom Data Company, Inc.
11220 Pagemill Road
Dallas, TX 75243
(214) 340-7081

Syquest Technology
47923 Warm Springs Blvd.
Fremont, CA 94538
(415) 490-7511

United Peripherals
432 Lakeside Drive
Sunnyvale, CA 94086
(408) 733-4200

Vertex Peripherals
2150 Bering Drive
San Jose, CA 95131
(408) 942-0606

Vufax, Inc.
5301 Covington Highway
Decatur, GA 30035
(404) 981-6778

XCOMP
7566 Trade Avenue
San Diego, CA 92121
(619) 271-8730

The following "big three" companies are the largest manufacturers of hard-disk drives and interfaces. You can contact them, should you require technical information for designing your own system. These companies usually only deal in quantities in the 100's, however.

Seagate Technology
360 El Pueblo Road
Scotts Valley, CA 95066
(408) 438-6550

Shugart Associates
475 Oakmead Parkway
Sunnyvale, CA 94086
(408) 733-0100

Tandon Corporation
20320 Prairie Street
Chatsworth, CA 91311
(213) 993-6644

your system to double-density, double-sided floppy disks, you can never hope to attain such power with floppies.

The Hard-Disk Difference

Although their technology is similar to that of floppy disks, hard disks incorporate some radical differences from their floppy cousins.

1. The disks themselves, as their name implies, are hard—they use a platter made of an aluminum alloy.

▶ **Storage media, read/write heads, and the positioning mechanism are enclosed in a sealed environment.**

2. The platters have an extremely thin coating of iron oxide, which can hold a magnetic charge. Iron oxide is the main ingredient in rust, which is why the disk platters are usually a rusty-orange color.

3. The disks spin at about 3600 RPM vs. about 300 RPM for floppy-disk drives.

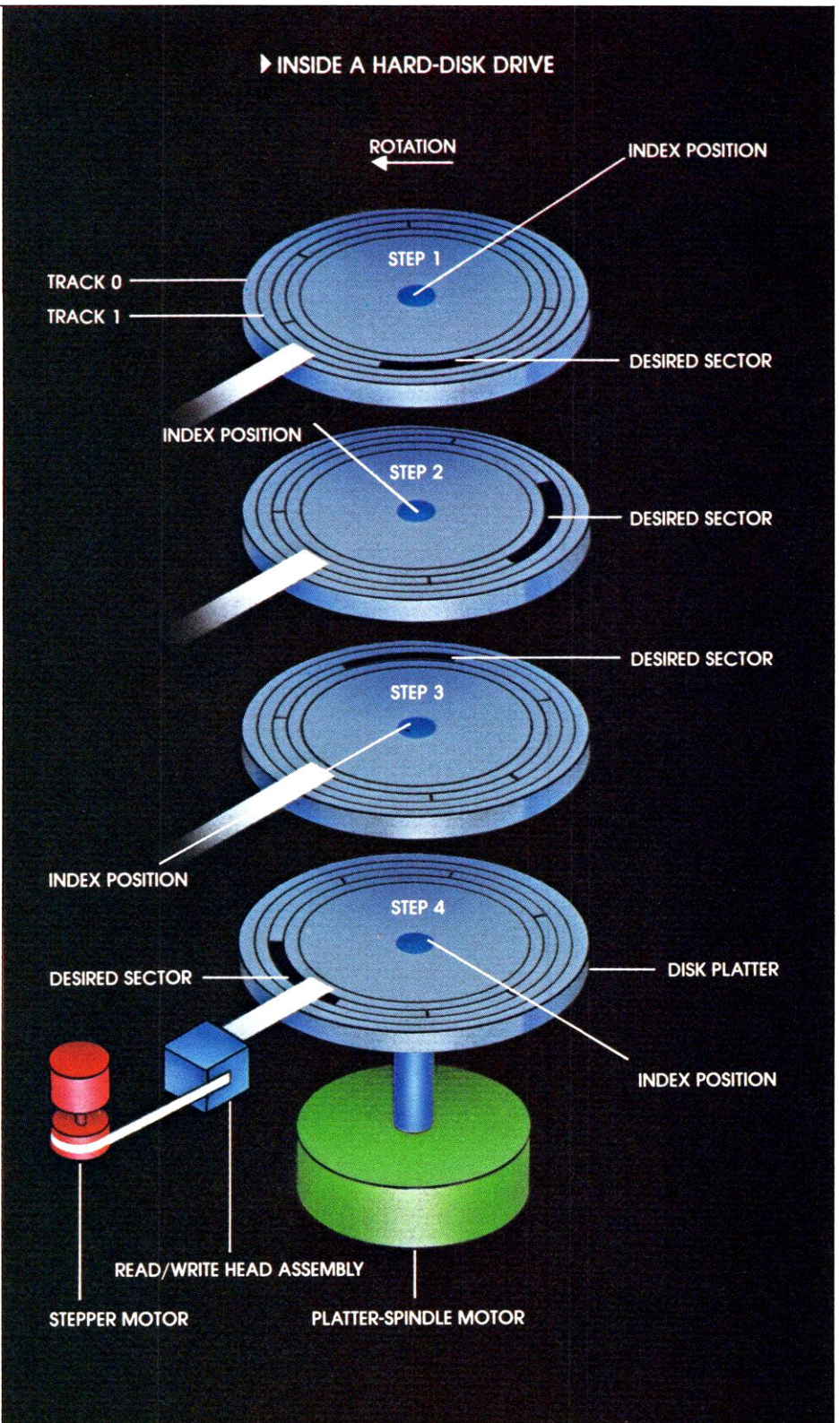
4. The read/write heads “fly” on a thin cushion of air the rapidly rotating disk generates. The aerodynamically designed “flying heads” never actually touch the disk surface in normal use, but rather maintain a distance of several microinches above the platter.

5. The read/write heads come to rest on a specially prepared “landing zone” when the drives aren’t in action.

6. Storage media, read/write heads, and the positioning mechanism are enclosed in a sealed environment through which a filtered air supply constantly circulates.

7. Systems now come with either fixed, removable, or a combination of both types of storage media.

The theory behind hard-disk design in general is to have the read/write head flying extremely close to the disk’s thin magnetic coating at a high speed. All these features of hard disks decrease the time the head needs to find information, while allowing for densities of about 300 tracks per inch, as compared to the 40 or 96 tracks per inch of the floppy drive. Since you measure seek times in milliseconds with hard disks instead of hundreds of milliseconds with floppies, and since hard disks give you data-transfer rates of up



to megabytes per second, hard disks are relatively efficient in disk-intensive operations.

Keep It Clean

Because of the close mechanical tolerances involved, the storage media, drive mechanism, and heads must be protected from contaminants to prevent the disaster known as “head crash,” which occurs if you bump the drive or if the flying head touches a speck of dust

or other particle on the disk’s surface. This hazard was a serious problem with early hard-disk technology and usually resulted in data loss and the need for expensive repairs. Fortunately, better shock absorption and filtration systems, together with sealed disk cartridges and drives that are assembled in clean rooms, have made disk crashes a rare occurrence in modern hard-disk systems.

Daddy, where do microcomputers come from?



Two informative books to teach your child about the family computer

Growing up in the computer world will be easier if your child understands computers. And there's no better place to start than with the computer that's in your home—and with the help of these two delightful books.

Katie and the Computer and *Computer Parade* read like children's story books. Yet each one actually teaches the basics of computer operation.

Katie and the Computer traces the fantastic journey that takes place after Katie falls into her family's new computer. Once inside the computer, Katie finds herself in the imaginary land of Cybernia where she meets Colonel Byte. The Colonel guides her on a fun-filled journey that parallels the path of a computer com-

mand. Supplementary information helps children relate the story to the actual computer.

Computer Parade is the second book in the *Katie and the Computer* series. This time Katie and her brother arrive in Cybernia just in time for a computer parade—and to learn how computer music is made. All along their fanciful journey, the threesome encounters friendly and ferocious dragons, computer bits, eeks and aaks. And of course they're always on the lookout for program bugs.

Any youngster age 4-10 will delight in these books. They're easy to read and richly illustrated in full color.

Help your child grow up computer literate by ordering your copies now.

MAIL TODAY TO:

CREATIVE COMPUTING PRESS

Dept. ND3B, 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Katie and the Computer* at \$8.95 each and *Computer Parade* at \$9.95 each, plus \$2.00 shipping & handling per book. Total Amount \$ _____

- Payment Enclosed. (CA, NJ and NY State residents please add applicable sales tax.)
 Charge my: American Express MasterCard Visa

Card # _____ Exp. _____

Signature _____

NAME _____ (please print)

ADDRESS _____

CITY _____

STATE _____ ZIP _____

*Outside U.S., add \$3 for shipping and handling.

- Check here to receive a FREE catalog of computing books, magazines and guides.
Also available in your local bookstore or computer store.

**For Faster Service,
PHONE TOLL FREE: 800-631-8112**

(In NJ only: 201-540-0445)

What about Backup?

Depending on your applications, you will want to backup some of the data on your hard disk. You have several approaches and methods from which to choose. One way is to use floppy disks for backup of all new information after each computing session. Presuming that your program originals are already on floppies, this procedure might not be too tedious.

Some hard-disk drives incorporate a continuous tape drive to backup the entire disk, and others have combination fixed/removable drives, which not only

▶ **You should look for a hard-disk system that fulfills your projected needs, as well as your current ones.**

simplify the backup process, but also provide much more data storage on multiple disks.

Which System Is Right for You?

Aside from checking into Apple compatibility, you should look for a hard-disk system that fulfills your projected needs, as well as your current ones. Five megabytes may sound like plenty of space, and it is, but even this amount can fill up quickly. You should make allowances for future data needs by buying a larger size that you can grow into, much as you purchase infants' clothing a size or two too large to allow for growth. If you anticipate greatly increased storage needs in the future, perhaps one of the newer systems with removable media would be your best bet. No matter what your choice, however, you can be sure that virtually any hard disk will afford greater efficiency and increased storage capacity, compared to a floppy-disk system.

What Does the Future Hold?

Just recently, two companies, Vertex Peripherals and Seagate Technology, announced 5¼-inch and 8-inch magnetic media with storage capacities of 100 and 102.1 megabytes, respectively. This quantum leap in capacity could mean price reductions on the smaller drives, as well as availability of a new generation of higher-capacity drives in the near future. +

Quality you expect, at a price you don't.

BECK DOUBLE DENSITY DISKETTES

SINGLE SIDED **\$2.19** / **\$2.79** DOUBLE SIDED

ea. / ea.

Our message to you is simple. If you like the quality of Dyan, Verbatim, 3M, et al, you'll like the quality of Beck soft sector, 5 1/4" flexible diskettes. The only major difference is cost. We're less expensive. In fact, a lot less expensive.

Why does Beck cost less?

Our philosophy is: Excellent quality and reliability, at a cost that beats the jackets off other diskettes. We can do it because we (1) put our money into the product, not mega-marketing schemes and fancy packaging; and (2) sell our money-saving 25-diskette pack to you direct via a toll free order line, so you get fast, door-to-door service efficiently.

**When you buy Beck, you've got the best.
Beck Quality. Beck Reliability.
And, of course, Beck Price.**

1D, soft sector 5 1/4" diskette \$2.19 each
2D, soft sector 5 1/4" diskette \$2.79 each

For IBM, Apple, TRS and 97% of popular microcomputers.

What about quality and reliability?

At Beck, our success as a diskette manufacturer depends upon our ability to provide you with a fully reliable, quality diskette - every time. For that reason we take no shortcuts. You get the best because we are committed to excellence. Every diskette is manufactured to very strict quality standards. We test and retest 21 times throughout the manufacturing process to insure compliance with no less than 42 rigid specifications. We make sure you get the very best - a 100% certified, 100% error free diskette.

Our satisfaction money-back guarantee and full **7** year warranty are proof of our commitment to excellence and confidence in our product.



(in New Hampshire call 924-3821)

Door to Door in 48 hrs.

**Order Now
Toll Free**



COD'S
CASH
ONLY

Corporate Accounts Welcome

1-800-BECKMFG

Order Toll Free 1-800-232-5634. Available in 25 pack only, plus freight, Complete with hub reinforcing rings, Tyvek envelopes, color coded user labels, and nonmetallic write protect tabs. All Beck Diskettes meet or exceed ANSI specifications.

THE WORLD OF DISK DRIVES

An array of
choices
awaits you.


Mass storage is an essential part of any computer system. The goal of this article is to provide the background you need to select the type of disk drive that best suits your requirements.

When the Apple II first came out, the choice of memory storage devices was simple: either use a tediously slow cassette tape recorder or buy a Disk II floppy-disk drive from Apple. With the increasing popularity of the Apple II family of computers, many manufacturers have developed disk-drive systems for the Apple. You now have the choice of dozens of different drives with a bewildering combination of forms, such as double-sided; double-density; half-height; micro-floppy; and 35, 40, 70, 80, 140, or 160 tracks.

THE APPLE DISK II DRIVE

The Apple Disk II was the first 5¼-inch floppy-disk drive in wide use with micro-computers. Before the introduction of the Apple Disk II in 1978, the only way to store and retrieve data on the Apple was to use a cassette-tape recorder. Although it was an inexpensive storage device, it was very slow—the tape had to rewind and play back so you could locate information on the tape. Larger computers

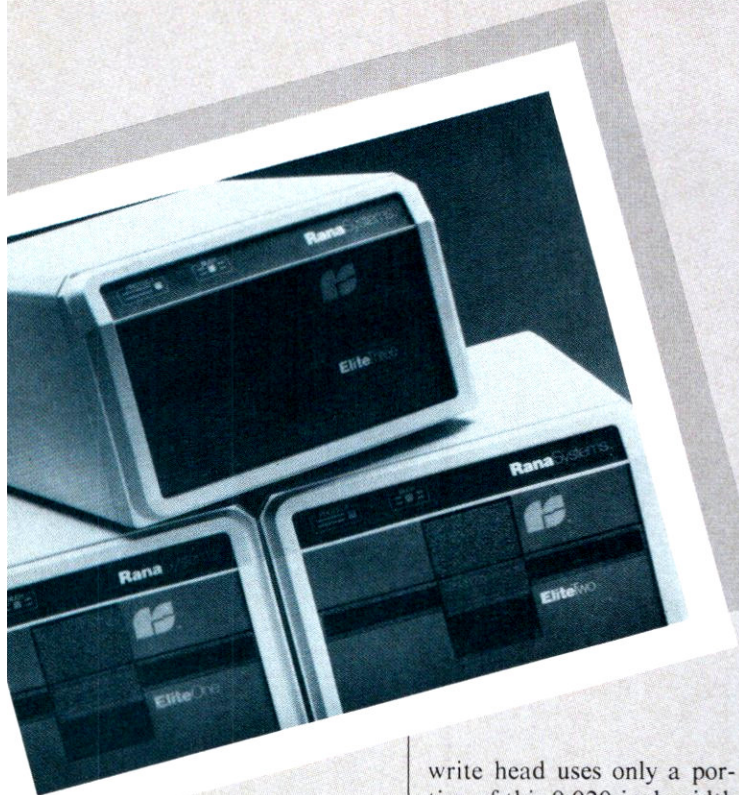


A hand in a dark suit sleeve with a white cuff is holding several overlapping, tilted photographs of early computer hardware. The photos show various components: a floppy disk drive with 'disk II' on it, a keyboard, a drive with 'AMDEK' on the front, and another drive with 'μ-SCI' on it. The background is a plain, light-colored wall.

of the time used 8-inch floppy-disk drives that required complex and expensive circuitry. Because it wanted to offer a less expensive, more convenient disk drive for its computers, Apple decided to design its own disk drive, using newer, smaller, 5¼-inch drives.

Steve Wozniak, co-founder of Apple and designer of the Apple II, went to work on the task. In one of the great engineering accomplishments of the decade, Wozniak designed a revolutionary new disk-drive controller, the electronic circuit necessary to operate a disk drive, during the week between Christmas and New Year's Day, 1977. Wozniak's disk controller was much less expensive, and more reliable, than anything that had been developed. Within three months of Wozniak's achievement, Apple became the world's largest producer of 5¼-inch floppy-disk drives.

The Apple Disk II drive is a storage device that uses magnetic media, as do audiotape and videocassette recorders. A floppy disk is a flat, circular platter made of Mylar or some other plastic. It is coated with a metallic oxide capable of holding a magnetic charge. The circular plate is encased in a square plastic cover to protect the sensitive surface from dust, fingerprints, and other contaminants that can destroy information on the diskette. The square cover has a large circular hole in the center to allow rotation of the diskette within the cover, and a small oblong cutout on each side that exposes the diskette's magnetic surface to the "read/write head." The cover of the diskette usually has an identification label in the upper left corner and a small notch about an inch down from the



▶ **The three Rana drives have identical styling, with all three dimensions about half an inch larger than Apple's Disk II.**

the Apple II family of computers.

RANA ELITE SERIES

This family of drives comes in three versions: Elite I, a 35/40-track drive; Elite II, a double-sided, single-density, 80-track drive; and Elite III, a double-sided, double-density, 160-track drive. Rana also offers a four-drive disk controller and a utility package for modifying DOS to work with these above drives. A unique and useful feature of the Rana drives is the write-protect indicator/switch on the front panel of the drive. A red light-emitting diode (LED) indicates that the diskette is write-protected, and a membrane-type switch next to the LED allows you to lock the drive into the write-protect mode, even if the diskette doesn't have a write-protect tab. I find it much easier simply to press the switch than to hunt up those elusive tabs and put them on the diskette when I copy or back them up.

The three Rana drives have identical styling, with all three dimensions about

diskette's cover exposes just over an inch of magnetic surface to the head. Because of its width, the head can get at less than three-quarters of that inch. Thus, with tracks spaced at 0.020 inch (48 tracks per inch), the Apple Disk II can use 35 different concentric tracks.

The Apple Disk II is a reliable, well-designed piece of hardware that is still useful, even though more advanced options have become available.

Now we'll discuss some of the other popular disk drives that you can use with

write head uses only a portion of this 0.020-inch width to allow some flexibility in the positioning of the disk between insertions in a drive and to allow for differences between drives.

The read/write head erases the full width to ensure that adjacent tracks do not interfere with each other.

The oblong hole in the

upper right corner. This small notch is known as the "write-protect notch." When the notch is exposed, the computer can read from and write to the diskette in a normal fashion. If you place a paper tab or a piece of tape over the notch, however, the disk becomes write-protected, which means that the computer can read information from the cassette but cannot write to it. Removing the tab restores the ability to write information to the diskette.

When you place a diskette into a drive, the identification label should face up, and the notch should be to your left. If a diskette is not notched, the computer cannot write to it unless you make a notch in the proper location, using a diskette-notching device.

The Apple Disk II diskette rotates above the read/write head at 300 RPM. This head can move in or out to stop over different concentric zones or bands, called tracks. On a standard 35-track Apple Disk II drive, these tracks are about two-hundredths of an inch apart. The read/

▶ **CHOOSING THE RIGHT FLOPPY**

Q. What type of diskette do I need for my Apple?

A. The Apple uses a single-sided, single-density diskette.

Q. Can it also use the more expensive double-density diskette?

A. Yes, quite handily.

Q. Will double-density diskettes double the computer's storage capacity?

A. No, the storage is the same whether you use single- or double-density media.

Q. Then why pay more for double density?

A. Because you get increased reliability due to the higher-quality recording surface.

Q. Can I use both sides of a single-sided disk?

A. Probably, but you're taking a big chance with your data because the second side hasn't been tested and certified by the manufacturer. Its reliability is questionable.

Q. What do guarantees and warranties imply?

A. They imply that the disk is free from defects of material or workmanship and that you can use and reuse the disk for the specified number of years, assuming you take proper care of it. You might want to ask the salesperson whether a warranty implies that five years from now the data you have stored on that disk will still be accessible or if it means only that you'll be able to re-

format and reuse the disk at that time. This distinction could make a big difference.

Q. Diskettes range in price from around \$2 to \$10 or \$12. What criteria should I use in deciding what price to pay for my diskettes?

A. How critical is your data? How long must it retain its integrity? Warranted reliability and name recognition are the major factors separating the cheapies from the classier diskettes. If you work in an environment where temperature or humidity extremes can affect your media, you'll want to look into the new diskettes that feature sensors to alert you to dangerous conditions.

Jessie Gunn Stephens

ple's Disk II and other standard 5¼-inch drives. All three drives use the same kind of door mechanism as the Apple Disk II, where the door latch also centers the disk, engages the hub, and places the head(s) onto the disk. I find this mechanism more convenient than the spring-eject mechanisms of the Micro-Sci A82 disk drive.

The DOS configuration program that comes with the Rana drives is the best I have seen. This configuration program allows you to specify the type of drive in each of four drive positions for each disk controller (the Rana controller supports four drives); to update various utility programs on Apple's DOS 3.3 System Master diskette; and to format new disks in 35-, 40-, 80-, or 160-track formats. Rana's replacement for FID (a disk-utility program from Apple), called RFS (for Rana File Copier), adds some nice features such as the ability to support Rana's four-drive controller. It prompts you for slot and drive assignments in each command (unlike FID, where you must keep resetting the slot/drive default), and it also has an Undelete feature.

Rana includes configuration programs for CP/M and Pascal. The Rana's manual is adequate, but not

should refer to the Apple DOS manual as well.

Rana Elite I

The Rana Elite is a single-sided, single-density, 40-track drive, which makes it upwardly compatible with the Apple Disk II drive. Without hardware or software modifications, DOS can use only 35 of the drive's 40 tracks, and it operates exactly like an Apple Disk II. Rana's DOS-configuration program allows use of all 40 tracks, increasing storage capacity by 20K bytes.

Rana Elite II

The next drive in the Rana family, the Rana Elite II, is similar to the Elite I, except that it can write to both sides of the disk and therefore has 80 tracks. Rather than call it an 80-track drive, Rana prefers to call it a double-sided 40-track drive. This designation helps distinguish it from the single-sided, double-density drives, such as the Micro-Sci A82. Since the Elite II is single-density (40 tracks per side), it can both read from and write to standard 35-track diskettes.

The Elite III is both double-sided and double-density. It has 80 tracks on each side, for a total of 160 tracks, 2560 sectors, and 655,360 bytes. Like all members of the Elite line, the Elite III has a write-protect switch and light on the front panel.

I found these elements especially helpful for protecting 35-track diskettes for use in the Elite III. Since the smaller tracks on the double-density Elite III probably have a higher bit-error rate than the tracks of the single-density Elite I, I tested the Elite III extensively. I did not get any I/O errors after running some test programs for several hours, and I have confidence that the Elite III is a reliable data-storage device.

▶ **The Micro-Sci A82 comes with both a utilities disk and a comparatively large manual.**



The Rana disk controller can control up to four drives when you use it with a modified version of DOS. Without the modified DOS, only two drives are accessible and DOS will give you error messages if you attempt to use drive 3 or 4. The controller comes with the same DOS configuration and utility disk that Rana ships with the Elite drives. I could find no evidence of the diagnostics mentioned on the controller's packaging, which was a disappointment.

The Rana disk controller can control the Apple Disk II drive and its clones, as well as all of the Rana Elite series drives.

MICRO-SCI'S DRIVES

Micro-Sci A2

The A2 Apple-compatible drive is similar to the Apple drive in size, operation, and appearance. It is a functional equivalent, with full software- and hardware compatibility.

The A2 drive comes with little documentation: a small single-page card that tells you how to orient the connector when plugging into the controller, the obligatory radio- and television interference warning, and a pair of disk-drive ID tags for marking drive numbers. Micro-Sci does not provide a diskette with the drive, as the company expects users to use the Apple DOS 3.3 manual as the manual for the A2. Since the two drives are nearly identical, this approach works well.

Micro-Sci A82

Although the A82 single-sided, double-density 80-track drive is similar in appearance to the 35-track A2, it has a different door and eject mechanism. To load a disk, you push in the disk until a spring engages and holds the disk in place. Then you can close the drive's door. To remove a disk, you push an eject button located just below the door—pushing the butt-

releases the door, and the disk is partially ejected by a spring. Operating this type of load/unload mechanism is more difficult than operating the door/load mechanism of the Micro-Sci A2 and the Apple Disk II. One problem is that the force necessary to seat the disk and cock the spring mechanism is sometimes enough to bend the diskette. Also, unlike the other drives, this one has no recessed section in the center of the drive, making it difficult to push the disk in all the way.

The Micro-Sci A82 comes with both a utilities disk and a comparatively large manual. After the ten-page installation section, the manual goes into a 50-page rehash of the material in Apple's DOS 3.3 manual. Only after all of these preliminaries do you finally find the five to ten pages of real information that you need about the operation of the A82 and the modification of DOS, Pascal, and CP/M to work with the A82.

Then you finally get the most important warning of all: "The A82 cannot write on a 35-track diskette; to do so would render the diskette unreadable in a 35-track drive." A double-density (80-track-per-side) drive can read a single density (35- or 40-track-per-side) diskette, and at first it appears that a double-density drive can write to a single-density diskette. The problem is that although everything appears all right as long as the double-density

drive is doing both the reading and writing, a 35- or 40-track drive will no longer be able to read that diskette. The data is not permanently lost, however, since you can read the data on a double-density drive and copy it back onto a new 35-track diskette.

Lest I leave the impression that the design of the A82 causes this problem, I should emphasize that this problem is inherent in the way that the double-density drives work—all manufacturers' double-density drives share this problem.

VISTA SOLO

The Vista Solo 35-track, Apple-compatible drive is similar to Apple's Disk II drive as well as Micro-Sci's A2 drive. The basic mechanism appears to be identical, as is the performance. The Vista Solo drive is both software- and hardware-compatible with the Apple Disk II drive, and you can use it with the Apple disk-controller card.

Since it is a clone of the Apple drive, Vista includes only a short installation guide, which recommends the Apple DOS manual for further information. Vista does not supply any software with the disk drive.

Vista also makes a controller, which is fully compatible with standard Apple hardware and works with Apple Disk II drives, Vista Solo drives, or other Apple-compatible drives such as Micro-Sci A2 drives.

In essence, the Vista Solo is fully equivalent to the Ap-



ple Disk II, except for the name on the logo and the price.

AMDEK'S AMDISK-I

The Amdisk-I drive uses a 3-inch-micro-floppy disk, which is encased in a hard cartridge measuring $3\frac{1}{4} \times 4 \times \frac{3}{16}$ inch. This cartridge has an automatic shutter mechanism that protects the magnetic surface when the disk is outside the drive. The cartridge also has built-in write-protect tabs, one for each side. You can easily set or clear write-protection with the tip of a pencil or ballpoint pen.

The Amdisk-I drive provides 143K bytes of storage in the format of the Apple Disk II (35 tracks, 16 sectors per track, 256 bytes per track). By manually flipping the cartridge, you can use the other side to get another 143K bytes. Although it uses

▶ **The Amdisk-I is fully software-compatible with DOS 3.3 and is directly plug-compatible with any Disk II controller.**

completely different physical media, the Amdisk-I is fully software-compatible with DOS 3.3 and is directly plug-compatible with any Disk II controller. Installation simply involves plugging the drive into any standard Apple disk-controller card.

The disk drive is a compact $4 \times 2 \times 7.5$ inches. You simply insert cartridges into a slot on the front of the drive, where a latching mechanism automatically retains the cartridge. An eject button on the front panel releases the cartridge, which a spring ejects.

The 3-inch disk cartridge is the Amdisk-I's strong point, in that the cartridge is more rugged mechanically than a normal floppy, it is smaller, and the automatic shutter offers increased pro-

▶ DISK DRIVE STORAGE CAPACITIES

DRIVE	Density	Sides	Tracks	Sectors	Bytes
Apple Disk II	Single	1	35	560	143,360
Amdisk-I	Single	1	40	640	163,840
Micro-Sci A2	Single	1	40	640	163,840
Micro-Sci A82	Double	1	80	1280	327,680
Rana Elite I	Single	1	40	640	163,840
Rana Elite II	Single	2	80	1280	327,680
Rana Elite III	Double	2	160	2560	6,553,600
Vista Solo	Single	1	35	560	143,360

tection to the recording surface. I would not hesitate to carry an Amdisk cartridge in a shirt pocket or a purse or to throw it into a desk drawer. Since the shutter is not watertight, however, I doubt that it provides protection against spilled drinks.

The 3-inch cartridge is also the Amdisk's weak point. Three-inch cartridges are not very popular, and you will still need a 5¼-inch drive to load commercial software. Although the diskettes appear similar to the ones the Macintosh uses, they are totally incompatible. Much software is easy to copy to a cartridge, but some protected software cannot be copied, and therefore you might always need a 5¼-inch disk drive. Three-inch cartridges are also significantly more expensive than a standard 5¼-inch floppy disk.

You might consider micro-floppies if you were setting up a multi-Apple system running software distributed from a central source. One application that might be suited for micro-floppies is in a company with sales offices

throughout the world that sets up an electronic-mail system using Apples and modems. In a multi-Apple system such as this, all software could be distributed on the 3-inch micro-floppy cartridges, which are easy to mail.

EVALUATION TESTING

I ran several tests on each of the drives. The tests were designed to detect errors in read/write operations or in positioning of the head to the selected track. All of the drives' error rates were so low as to be nearly undetectable, and I have developed a healthy respect for the robustness of the encoding scheme devised by Apple's engineers.

RECOMMENDATIONS

I found the Apple Disk II and all of the look-alikes to be equally satisfactory. My experience with drives is that, as with many mechanical devices, you run into an occasional lemon, even though most drives work well. Therefore, I strongly recommend that you buy drives only from someone who can provide service if you need it. +

▶ TYPES OF DISK DRIVES

The following is a discussion of various forms of drives and their compatibility with the Apple Disk II:

Apple Disk II Look-alike:

This kind of drive is functionally the same as the Apple Disk II. It is directly compatible in both hardware and software, and you can use it exactly as if it were a Disk II, with no software or hardware modifications.

Upwardly compatible: If you use this kind of drive without modifying to DOS, it appears to be an Apple Disk II. With modified DOS, this type of drive can access 40 tracks.

Double-density: This type of drive can read a standard 35-track disk but if you use it to write data to a 35-track disk, a standard drive won't be able to read that disk. When you use it with a modified DOS, this type of drive doubles the available storage capacity by using 80 tracks. On a double-density drive, the tracks are only half as wide (about 0.010 inch), giving you 96 tracks per inch. The head can access 70 to 80 tracks on one side of a disk. In summary, a single-density drive has either 35 (as in the case of the Disk II) or 40 tracks per side, and a double-density drive has 70 or 80 tracks per side. Since the spacing of single-density tracks is 48 to the inch, a single-density drive is sometimes called a 48 TPI (tracks per inch) drive. Similarly, a double-density drive is sometimes referred to as a 96 TPI drive.

Double-sided, single-density:

This type is upwardly compatible, in that it can read from and write to standard single-sided, single-density 35-track diskettes when you

use it with an unmodified DOS. With a modified DOS it can access 40 tracks on each side of the diskettes.

A double-sided drive can read and write both sides of a diskette—it uses an extra read/write head above the diskette—which doubles the number of tracks and the amount of data the drive can store. An important caveat is that you cannot use a single-sided drive to read double-sided diskettes onto which a double-sided drive has written information. Although a single-sided drive can read from and write to both sides of a diskette if you manually flip it over, flipping the diskette reverses its rotation. Thus, the single-sided drive cannot read the obverse side of a diskette that contains data written to it by a double-sided drive.

When you use a single-sided drive to write data to both sides of a double-sided diskette, you end up with a "reversible" disk, often called a "Flippy-Floppy" to distinguish it from a disk on which you write to both sides, using a double-sided drive.

Double-sided, double-density:

Like the double-density drive, this drive can read a standard 35-track diskette. If you write to a 35-track diskette with a double-density drive, though, a standard drive won't be able to read that diskette.

Incompatible, but software compatible, media:

This designation fits drives, such as the Amdek micro-drive floppy, that use a completely different type of diskette. Although you cannot use the diskette with a standard drive, the Amdek drive has the same format as a Disk II. You can use it with a standard DOS and plug it in to a standard Apple disk controller.

▶ PRODUCT INFORMATION

Amdisk-I

Amdex Corporation
1565 Sunflower
Costa Mesa, CA 92626
(714) 662-3949

List Price: \$299 (without controller)

A2 and A82

Micro-Sci Corporation
2158 South Hathaway
Street
Santa Ana, CA 92705
(714) 662-2801

List Price: A2: \$345 (without controller), \$445 (with controller); A82: \$569 (without controller), \$669 (with controller)

Elite I, II, and III

Rana Systems
21300 Superior Street
Chatsworth, CA 91311
(213) 709-5484

List Price: Elite I: \$349; Elite I Plus (includes

controller card): \$449; Elite II: \$549; Elite II Plus (includes controller card): \$649; Elite III: \$649; Elite III Plus (includes controller card): \$749; controller card alone: \$125

Vista Solo

Vista Computer
Company, Inc.
1317 East Edinger Ave.
Santa Ana, CA 92707
(714) 953-0523

List Price: Solo: \$299 (without controller), \$379 (with controller)

Apple Disk II

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

List Price: Disk II: \$395 (without controller), \$545 (with controller)

D I S K S IN-RAM'S-CLOTHING

Solid-state floppy-disk drive emulators

Recent years have brought rapid advances in RAM-chip technology resulting in lower costs, higher memory densities, and greater reliability. These gains have resulted in many new products for consumers, among them solid-state-memory systems, or disk emulators. These devices have RAM chips formatted by software to seem just like a floppy-disk drive to the computer. They are capable of doing anything that a disk drive can normally do, and they greatly enhance operating speeds. Other advantages are reliability and decreased mechanical and media wear.

Faster and more reliable than floppy-disk drives, RAM disks have faced two major obstacles that have slowed their acceptance. The first is the volatile nature of RAM, which loses the contents of memory if you lose power. Using low-power CMOS memory with battery backup is a way of eliminating this problem—this solution becomes more attractive as CMOS prices drop. The second problem is the high cost of these newer high-capacity chips. Price will become less of an issue, however, as costs fall and availability increases. For example, the Axlon Ramdisk 320, which retailed for \$1395 as recently as the middle of 1983, was selling for \$999 by the beginning of 1984.

What follows is a review of two RAMdisks that represent two different approaches to the design of these products. The first, Syntex's Flashcard, incorporates RAM on a peripheral card that you install in one of the Apple's expansion slots. The other, Axlon's Ramdisk 320, is an external unit about the size of a standard 5¼-inch disk drive, which connects to the Apple via a ribbon cable and interface card and features battery backup. Expect to see other similar products as more manufacturers jump on the bandwagon—they are likely to make use of one of

these two approaches.

FLASHCARD DISK EMULATOR

The Flashcard from Syntex, Inc., is a peripheral card that fits inside one of the Apple II's expansion slots. Once installed, the Flashcard emulates one or two standard floppy-disk drives, depending on the model.

Model 2201, which provides 147K of RAM and emulates one disk drive, has 16 64K RAM chips in its 32 I.C. sockets. Adding 16 more RAM chips upgrades the Flashcard to the 294K Model 2202, which emulates two drives. Both models use the same owners' manual and software.

Installing the card is simply a matter of turning off your Apple's power, taking off the cover, and inserting the Flashcard in any available slot. The

Syntex's Flashcard incorporates RAM on a peripheral card.

manufacturer recommends use of slot 5 for a single-unit system and slot 4 for a second Flashcard. The reason for these slot assignments is to provide compatibility with CP/M and Pascal, which both expect additional memory to be located in these slots.

The Flashcard comes with three disks that have the disk-emulation software, or drivers, you need to use it with DOS, CP/M, or Pascal. You boot the appropriate disk to configure the Flashcard for your system.

To install the Flashcard driver, you simply select options from the Displayed menus. As with a normal floppy disk, you have to initialize the Flashcard, which you can do with the usual INIT command or with a Copy program that does its own formatting.

The Apple treats the Flashcard as a normal disk drive. All standard DOS commands operate in their usual man-

ner, with one major difference: operations that involve data transfer with a disk take only a fraction of the usual time. When you press the Return key after a Catalog command, your screen will instantaneously fill with information. A similar process with a mechanical drive would take several times longer. Most disk I/O operations benefit from speed increases of 100 to 500% (see table).

Since all data disappears from the Flashcard's memory when you shut the system off, you have to transfer to a standard floppy disk all files that you want to save. The people at Syntex tell me that an on-board battery backup may be designed into a future model to prevent accidental erasure of data by brief power failures.

RAMDISK 320

Axlon's Ramdisk 320 is also a solid-state-memory system like the Flashcard, but it is notably different. It is an external unit, with its own power supply and backup battery, that connects to an Apple expansion slot via a cable and interface card. The main memory unit resides in a solid metal box the size and color of an Apple Disk II drive, weighing in at eight pounds. Inside this box is a matrix of 40 64K RAM chips that provides 320K bytes (327,680 bytes) of virtually instant memory. This unit also contains the main power supply, which provides filtered power to operate the main memory and the interface card. It also trickle-charges the enclosed battery, which can maintain memory for up to three hours in the event of a power outage.

This box of "powered chips" connects to the Apple's bus via a ribbon cable and interface card. The interface card, which installs in either slot 4 or 5, draws power from the Ramdisk unit. Since some of the card's circuitry is live at all times, handling it while it is connected to the main system requires particular care. Four rubber feet on the card and a passing mention in the man-

ual of the hazards of this situation are the only effort the manufacturer has made to protect users. A good practice is to disconnect the cable from the interface card before removing it from or installing it in the Apple.

Thanks to a concise installation-guide section in the manual, the procedure takes less than ten minutes. The interface card goes in either slot 4 or 5 of an Apple—the power has to be off. The cable from the main memory unit connects to this card. Plugging the main memory unit into the AC power line with its attached power cord and switching it on completes the hardware installation. You then turn your Apple on and boot your standard DOS 3.3. After booting DOS you run the programs on the DOS System Master Disk from Axlon, which contains programs that configure the Ramdisk as one or two additional disk drives.

The Ramdisk's RAM works like the Apple's disk memory, except that Apple disk drives divide the diskette into 35 tracks with 16 sectors of 256 bytes each, for a total of 143,680 bytes of storage, and the Ramdisk divides its memory into 40 tracks of 16 sectors each, for a total of 163,840 bytes of memory.

Typically you format the memory as

drives 1 and 2 of slot 4. The Option program then modifies your DOS diskette to activate the Ramdisk. Subsequently, every time you turn the system on or boot it, the entire contents of mechanical drive 1 are copied onto the Ramdisk's drive 1. You can then choose between formatting the Ramdisk's drive 2 or preserving any data from previous sessions.

The Ramdisk's RAM works like the Apple's disk memory.

The Ramdisk 320 operates in either its Battery mode or in one of three AC-power modes. When the unit is in use in the Full Access mode—i.e., when it's activated in the Apple's bus—it uses 30–32 watts of power. In the Memory Refresh mode, in which the system indefinitely maintains previously stored data, the unit draws 20–22 watts. A plugged-in unit with its power switch off still draws 5–10 watts to keep the power supply active—remember the live interface board—and the battery fully charged. The final operating mode is Battery Backup, which switches on in

the event of an AC-power interruption while the unit is in the Full Access or Memory mode, providing power to maintain memory for up to three hours.

Like the Flashcard, the Ramdisk comes with the necessary drivers and installation, copy, and formatting programs to allow operation with DOS 3.3, CP/M, or Pascal. The RDCOPY program can copy an entire disk from a mechanical drive to the Ramdisk, or vice versa.

Using the Extra40 program lets you take advantage of the additional 20K bytes of memory you get on each drive when you're in a DOS system. The Ramdisk gives you this extra memory because it has 40 tracks of memory, instead of the Apple's 35 tracks. This utility is not necessary for CP/M, which sees the Ramdisk as drives C and D (40 tracks each) or as a single 320K byte C drive.

The DOS System Master includes two useful utility programs that show you how to use the Ramdisk to its full potential. The first is a data-management program called Directory, which can store, sort, and retrieve more than 3200 records at lightning-fast speeds. It finds any record in about two seconds.

The other program, Mini-Base Phone Book, provides features such as report generation and access to up to five files, with 200 records of up to six fields each per file.

Both products performed as advertised without a hitch. These devices are a real convenience, and the time savings for disk operations are substantial. I'm somewhat prejudiced towards the Axlon product, finding a little extra assurance in the battery backup. Also, the Ramdisk produces less heat inside the Apple's case. I encountered no problems with either product, though, and my preference may be an unfounded fear of memory loss. The offer of on-board battery backup on a future Flashcard model will eliminate the edge I feel that the Axlon system has.

Axlon is considering selling the Ramdisk 320 with fewer chips to lower costs and to give you the option of adding a full complement of chips later. The company also offers the new Axlon #5MB, which is a 5-megabyte RAM disk compatible with the Axlon 320.

As the new 256K bit RAM chips become available, they should not only help to lower 64K RAM prices but should also open the door to even larger systems. +

▶ RAM CHIPS IN APPLES

Early Apples used 16K bit RAM chips to provide the computer's working-memory area. Since memory costs were high, these Apples often came with a partial complement of memory chips. Users could add more memory by installing banks of eight chips until the motherboard held its full complement of 24 16K RAM chips—48K bytes of user RAM. To get a 64K machine, you had to install a language or memory card, also populated with these 16K chips, into slot 0. The newer Apple IIe's use advanced 64K bit memory chips, only eight of which on the motherboard give you a 64K byte machine.

▶ PRODUCT INFORMATION

Flashcard Solid State Disk Emulator

Synetix, Inc.
15050 N.E. 95th Street
Redmond, WA 98052
(206) 828-4884

List Price: Model 2201 (147K) \$349,
Model 2202 (294K) \$529

Requires: Apple II, II Plus, or IIe

Ramdisk 320K Memory System

Axlon, Inc.
170 North Wolfe Road
Sunnyvale, CA 94086
(408) 730-0216

List Price: \$999

Requires: Apple II, II Plus, or IIe

▶ EXECUTION SPEEDS

Program	APPROXIMATE TIME (SECONDS)	
	Solid-State Drive	Apple Disk II
DOS Boot (Language Card load)	1	14
Com-Ware (communications)	6	34
WriteAway (word processor)	6	25
Catalog	instantly	3–6
Text files (up to 28K)	1–3	5–20

Comparison of execution speeds of Apple Disk II and solid-state drives





► MASS STORAGE/BY STEVEN MARKS

ACCELERATING YOUR APPLE

The right peripherals can do the job.

The Apple II is a reliable and versatile computer. Even though the computer's 6502 microprocessor can execute about 500,000 instructions every second, some people would like their Apple to go a bit faster. This article describes three ways to speed up the performance of your Apple II: (1) using an electronic RAM disk in place of a floppy-disk drive, (2) using a printer buffer to speed up the printing process, and (3) using a faster version of the 6502 processor.

Turbocharging an Apple

The speed of the computer is important in most applications. Unfortunately, informal discussions of computer speed usually take into account only the gross speed of the whole system. When engineers talk about the speed of a computer system, they are usually referring to one of two different speeds, the speed of the processor or the speed of the input/output (I/O) system. The type of speed increase that will be most beneficial depends on the intended application.

When most people talk of computer speed, they are generally talking about how quickly the microprocessor executes commands, such as adding two numbers together or centering a line in a word-processing program. Micro-

processors have fixed operating speeds.

Of primary importance in any consideration of I/O speed is the data-transfer rate to and from the disk drive. Since most applications access the disk frequently, the speed of the disk drive is usually more of a limiting factor than is the speed with which the computer can act on the information.

Lumping together microprocessor and disk speed is deceiving, since you need to distinguish which factor might be causing a performance bottleneck. A task that is heavily disk-intensive will realize little gain from an increase in the speed of the microprocessor, even though the computation speed would be faster. Understanding the nature of the task we want to speed up provides the clues we need to get the Apple up to warp speed.

Speedy Disks

Since disk drives are mechanical devices, their speed is limited compared to that of the electronic components of a system. The read/write head of the drive must physically move from one track to another to read or write information. Apple's Disk II drives have a further disadvantage because of their design.

If you've had experience using other computer systems, you know the Disk

II is a comparatively slow drive, mainly because it was one of the first 5¼-inch drives ever produced. Hard-disk drives are much faster than floppy drives, but they are also mechanical devices and therefore take time moving the head from track to track, reading and writing data. By using disks that are not mechanical, you can realize a great

▶ When you catalog a disk, using a RAM disk, you can't even get your finger off the Return key before the catalog appears.

speed increase.

A solution to the speed limitations of disk drives has been available for several years: The RAM disk involves RAM chips, the same chips that are used for memory inside of the computer.

You place the RAM chips on a plug-in board and configure them to function as a disk drive. All you need is a program that tricks the computer into thinking the RAM is actually a physical disk drive. Since the RAM disk has no moving parts, it greatly increases response time.

How fast is it? Manufacturers claim speed increases of 10 to 20 times the disk-drive speed. In actual use this speed increase translates into virtually instant response. When you catalog a disk, using a RAM disk, you can't even get your finger off the Return key before the catalog appears. Once I'd tried a RAM disk, I knew I couldn't live without one. You actually have to use one to believe the speed.

RAM disks, also called "solid-state disks," "electronic disks," or "pseudo disks," get the Apple to respond like a well-oiled machine. If you have ever spent time working on a large program, you know how long it takes to continually load, modify, and save a file. The process seems to take forever when you are anxious to see if your latest changes were successful. The RAM disk removes delays, allowing you to concentrate on the task at hand.

Spreadsheet users will also find RAM disks beneficial. Spreadsheets are notoriously hungry for memory. Many RAM disk cards come with special software for use with VisiCalc and

other spreadsheet programs, which allows the use of the RAM on the card for holding large spreadsheets.

Several popular plug-in RAM-disk boards are available for the Apple. The most common sizes are 128K and 256K. If you need them, and your pocketbook can stand the shock, you can use several RAM disks together, each acting as a separate drive. If you use CP/M or Pascal, you should make sure the RAM card you are interested in comes with software for use with those operating systems. Reviews of three of the popular RAM boards, from Legend, Titan, and Omega, appeared in Volume 1, Number 2 of *A+*.

RAM disks are not inexpensive. A 256K pseudodisk usually lists for about \$795. 128K versions sell for about \$499—a big investment if you are not sure the speed advantage is worth it. You can get a taste of RAM-disk speed without the big investment, however. Precision Software in Milwaukee, Wisconsin, sells a program that turns the additional 64K in an Apple IIe extended 80-column card into a RAM disk. So far, the company's only version is for running programs under Apple DOS and Pascal, but CP/M support is in the offing.

If you don't own an extended 80-column card, don't despair. Several programs turn the upper 16K of any 64K Apple into a small pseudodisk. Although 16K doesn't give you much space to work with, it can give you an idea of what a RAM disk is like before you make an investment. Check with your local users' group for a copy.

The capacity of 128K RAM disks is a bit smaller than that of an Apple Disk II drive, which has a capacity of 143K. The closeness of size raises interesting possibilities.

If you delete the DOS tracks (which the pseudodisk cannot use) and some of the unused catalog space, then the capacity of the RAM disk would be the same as the Disk II's. To my knowledge, no one has written a program yet to take advantage of this size correspondence.

A second function RAM disks can serve—with appropriate software—is to speed up routine disk copying. If your RAM disk is large enough, you can write an entire disk to the RAM card in a single pass and then write to the destination disk in a second pass. Copying an entire disk in this manner takes less than 30 seconds. The greatest advantage is to owners of single-drive computers, who have to suffer through

multiple disk changes to copy a disk.

The Best-Laid Plans

Now for the bad news: copy protection. Copy protection is the scourge of the Apple world. Since you cannot transfer a copy-protected program by normal means, you cannot move it to the RAM disk. The RAM disk is useful only for unprotected programs.

A second limitation involves programs that direct disk access to slot 6. After you transfer the program to the RAM disk and attempt to run it, it may still try to find a disk in one of the floppy drives.

Since many Apple DOS programs are copy-protected, the copy-protection limitation makes the RAM disk most useful for CP/M programs, which are not usually copy-protected. Placing WordStar, for instance, in the RAM disk makes the program run much faster than usual.

A final word of warning about using RAM disks: since they are not real, physical disks that offer permanent storage, you have to copy data back to a floppy disk before turning off the computer. If you don't, the program, along with any changes, will disappear. Most users that have had such an experience are not likely to repeat it.

The Two-Headed Apple

More often than not, the printer is the element that slows down a system the most. We can do little but wait while the printer is printing. Ceilings, carpets, and even dust particles floating in the air take on an unusual fascination when we wait for the printer to fin-

▶ If you need them, and your pocketbook can stand the shock, you can use several RAM disks together, each acting as a separate drive.

ish. If the computer did not have to wait while the printer worked, it would be free for other tasks.

Freeing the computer from waiting for the slower printer is exactly the function a print buffer serves. The print buffer is an area of RAM between the computer and printer. It works like a bucket with a small hole in the bottom.

SEIZE CONTROL.



smart
Add a Print Screen Key to your Apple.

FingerPrint™ is the parallel printer interface card that puts Apple in the palm of your hand. But that's only the beginning. A touch of the FingerPrint button puts any program on hold, so you can make hard copies of any graphics or text. And do things Apple never imagined.

FingerPrint consists of the printer interface card connected to a touch-sensitive button that adheres to your keyboard.

It also comes with a free printer cable and a disk loaded with programs. Now with VisiCalc enhancements.

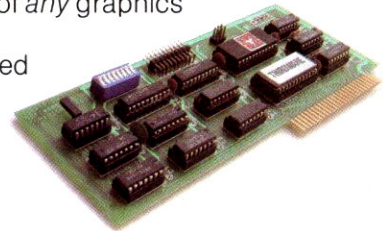
We made FingerPrint smart. You can make it even smarter.

The built-in ROM provides functions like Print Screen, Program Pause, Graphic Dump, Jump to Keyboard or Monitor for De-bugging and more. With 2K of user RAM, you can invent new functions such as Keyword Search and Replace or special tasks only you could dream up.

FingerPrint works with any parallel printer made. And it can be programmed to interface with new printers as they come on the market.

Get the most out of your Apple II, Apple II+ or Apple IIe. Order FingerPrint today. Or visit your nearest dealer for a test flight.

Thirdware has a whole family of innovative computer products. Including a multiple-printer parallel interface, slim-line disk drives, diskettes, disk cases and the only protective sleeves that remain in place while the disk is in use. Write for our latest catalog.



ORDER TOLL-FREE.

1-800-528-6050

Ext. 2112

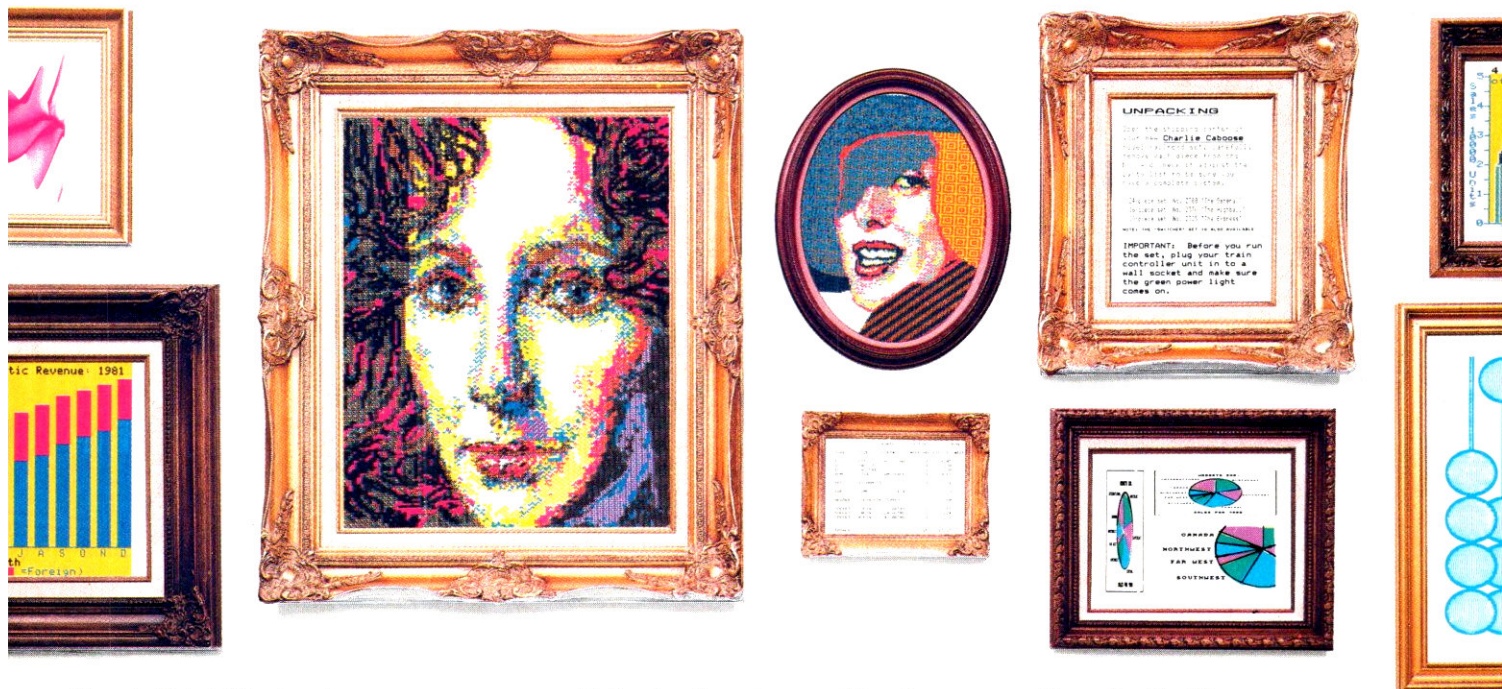
In Arizona:

1-800-352-0458

THIRDWARE
COMPUTER PRODUCTS 

- Please send a free Thirdware catalog and complete information on FingerPrint.
- Please send _____ FingerPrint(s) @ \$149 each. (Add \$3.50 shipping & handling for each one ordered.) FL residents add 5% sales tax.
- Enclose check or credit card authorization for full amount.
- Name _____
- Address _____
- City _____ State _____ Zip _____
- Charge to: MasterCard/Visa (Circle one)
- Acct. No. _____ Expires _____
- Signature _____
- Mail to: Precision Software, Inc.
4747 NW 72nd Avenue Miami, FL 33166

DID PICASSO DO IT?



Create Print Masterpieces with Text and Graphics.

Upgrade the Apple II, II+, IIe or III computer and any parallel printer to a complete text and graphics output system with the newest and most versatile interface, PKASO/U. (Pronounced "Picasso," the "U" is for Universal). And make use of every capability available from the printer. And gain additional text and graphics features to turn every printout into a masterpiece.

Get Greater Visual Range and Instant Screen Printouts.

Gain every state-of-the-art printing capability, including exclusive features not offered by any other interface:

- Magic Screen Dumps — instant, single-command snapshots of *any* image on the Apple screen, graphics or text. What you see is what you get!
- Print the graphics screen *any* size — from inches to feet — another PKASO/U exclusive.
- Instantaneous, single-command Lo Resolution Screen Snapshots, only from PKASO/U.
- Super Resolution — higher resolution graphics from your dot matrix printer than possible on the screen, only from PKASO/U.
- 4-way Rotation of image — 90°, 180°, 270°, 360° — positioned anywhere on the page.
- Direct or Reverse Printing — black on white or white on black.

- Full color for printers with color capability.
- 16-level gray scale for black and white photographic images, only from PKASO/U.
- Aspecting, with separate width and height adjustments for any size and aspect ratio.
- Windowing, the printout of any selected portion of a graphics image in any size — equal, enlarged or reduced, another PKASO/U exclusive.
- Low-cost clock/calendar option for time/date stamping, available soon.

Get Universal Compatibility with Current/Future Technology.

Link the Apple computer with any and all major parallel printers of today or tomorrow. Unlike other printing interfaces which are limited by ROMs or DIP switches with pre-set configurations, PKASO/U is completely configurable for either present or yet-to-come Centronics parallel-interfaced printers. Another only-from-PKASO/U feature.

Add ShuffleBuffer for a Complete Upgrade.

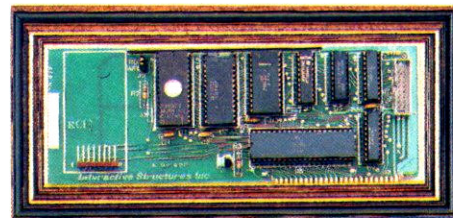
The new Buffer with a Brain, ShuffleBuffer, does the printer-feeding work of the Apple so the computer is free to perform other tasks. It's the only buffer that can rearrange stored data, mix and merge, repeat and reprint. Ask your dealer for a demonstration.

Pays for Itself with Color Ribbon Savings.

Exclusive Mosaic Mode suspends color dot overprinting operation, uses color dots printed next to each other (not on top of each other) to achieve the desired shade. And since fewer dots are printed, less ink is used, ribbon life is doubled and the PKASO/U pays for itself in ribbons saved.

Do it with PKASO/U.

A fully-documented Demonstration Diskette and detailed User Manual make it easy; just plug in the cables (included) and start producing masterpieces. Explore the amazing capabilities of PKASO/U by visiting a nearby computer peripherals dealer. Or call us directly at (215) 667-1713 and we'll send you the details. Unframed.



PKASO/U DID IT.



Interactive Structures, Inc.
146 Montgomery Avenue
Bala Cynwyd, PA 19004
(215) 667-1713

The computer quickly fills up the buffer with data and trickles it into the printer at a rate the printer can accept. The computer refills the buffer, then waits for it to drain, and then fills it up again as long as you have data to print. Between fillings the computer is available to do other tasks.

One popular printer buffer is the Microfazer from Quadram in Norcross, Georgia. The Microfazer is a stand-alone unit that comes in buffer sizes ranging from 64K to 512K. The 512K buffer is big enough to hold about 250 typewritten pages.

If we were working with a word processor and wanted to print a file, we could start the printing, sending the file to the buffer, where it would wait for the printer to accept it. Once you send the file, the computer is freed from the printing process and ready for more work.

In addition to this basic function, print-buffer packages often offer several other nice features. For little more than the price of a printer interface, you can get a 64K print buffer and the interface on a single card. Since you need an interface card to connect the printer to the Apple anyway, this is a real bargain, and you should consider it if you do any substantial printing. MicroTek in San Diego, California, offers a package called Dumpling-64 that includes a parallel interface, a 64K print buffer, and a program that compresses data in order to allow a total of 250K of print buffering.

Another feature common to print buffers is a copy button. After you send data to the buffer, the printer can make multiple copies of the material in the buffer, while the computer is free to work on another task.

New, "smart" print buffers that are just coming to market take over more of the computer's functions. A microprocessor integrated into the buffer gives you extra control of printing. The ShuffleBuffer from Interactive Structures in Bala Cynwyd, Pennsylvania, allows you to interrupt long print jobs to do short jobs, using a process called bypass printing. The ShuffleBuffer is even smart enough to count the number of copies you want made without the computer's help. You can move paragraphs around in the buffer and merge information into documents that are already in the buffer.

Interactive Structures claims that the ShuffleBuffer can "merge-print" 1500 letters in less than 60 seconds of actual computer time. That claim is

pretty impressive for a print job that would normally tie up both computer and printer for 22 hours.

If you spend most of your time printing, then a print buffer should be high on your list of add-ons.

Accelerated Computing

The speed of data movement (I/O) is only half the battle in creating a

▶ **For little more than the price of a printer interface, you can get a 64K print buffer and the interface on a single card.**

speed-demon computer. Once you load data into the computer, the computer's processor takes over and executes the program. Here is where the actual computing takes place. The type of processing differs, depending on the type of program. A database may sort items alphabetically, a word processor may justify text, and a graphics program may draw a picture when you run the program. In each of these cases, the computer must do some "thinking" to execute the command. The time the task takes is related to the speed of the microprocessor in the computer.

Although the Apple can execute more than 500,000 instructions per second, it is not known for having a very fast processor. Its computational speed

is slower than that of many other microprocessors available these days. If your programs require a lot of computation—often called "number-crunching"—you may need a faster processor. The faster the processor operates, the faster the program will run. Boards called "accelerators" give the Apple faster processing speed.

An accelerator card, an auxiliary processor for the Apple, usually has the same type of microprocessor as the Apple, a 6502, but the microprocessor on the accelerator runs at a faster speed than that of the similar chip on the Apple. (See "Accelerator II," Volume 2, Issue 3.)

Speedemon from McT of Santa Monica, California, is one of the lower-priced accelerator cards for the Apple at \$295. The card, since the processor is still a 6502, runs all Applesoft, Apple FORTRAN, Pascal, and VisiCalc programs. Virtually any program can run with these cards, copy-protected or not. And run they will, a whopping 3½ times faster than normal. This speed increase is phenomenal, but the perceived increase is even greater. Programs seem to run about six times faster than usual with the card.

Start Your Engines

If your taste runs to Ferraris, the combination of a RAM disk and accelerator card is hard to pass up. Imagine the pleasure of instant response to your commands, the sound of your Apple revving up in the pits. The joy of a speeded-up Apple is the sheer pleasure of incredible performance. So next time people say your Apple is slow, challenge them to a race. +

▶ LIST OF MANUFACTURERS

Interactive Structures
146 Montgomery Avenue
Bala Cynwyd, PA 19004
(215) 667-1713

Legend Industries, Ltd.
2220 Scott Lake Road
Pontiac, MI 48054
(313) 674-0953

McT
1745 21st Street
Santa Monica, CA 90404
(213) 829-3641

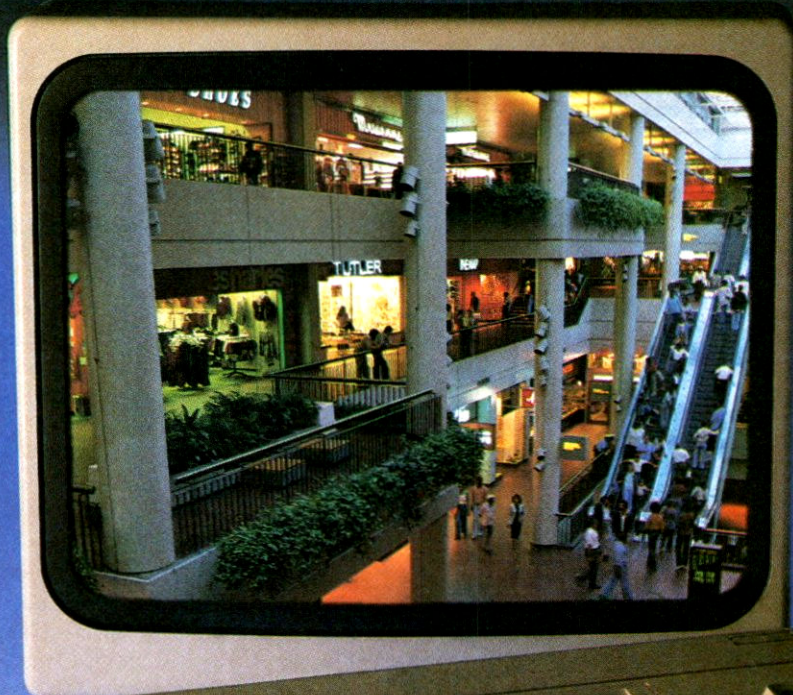
MicroTek
4750 Viewridge Avenue
San Diego, CA 92123-1690
(619) 569-0900

Omega Microware, Inc.
222 South Riverside Plaza
Chicago, IL 60606
(312) 648-1715

Precision Software
6514 North Fresno Street
Milwaukee, WI 53224
(414) 353-1666

Quadram Corporation
4357 Park Drive
Norcross, GA 30093
(404) 923-6666

Titan Technologies, Inc.
3990 Varsity Drive
Ann Arbor, MI 48104
(313) 973-8422



BY THE YEAR 2000, THE WORLD MAY CATCH UP WITH THE WAY COMPU SERVE'S NEW ELECTRONIC MALL™ LETS YOU SHOP TODAY.

Introducing the first computer shopping service that brings you convenience, savings and enjoyment.

Here's your chance to expand the practical uses of your personal computer.

Sign up for CompuServe and shop in our new Electronic Mall. It's easy to use. It tells you more about the products you're buying. It lets you order faster. And it's totally unique.

CompuServe's new Electronic Mall™ offers you all these shopping innovations.

– It's enormous! So it gives you in-depth information on thousands of goods and services, and lets you buy even hard-to-find merchandise. – Its unique "Feedback" service lets you ask the merchants themselves specific questions. – It's incredibly efficient in ordering the products and services you want.

– Its special discount opportunities make it economical, purchase after purchase. – And its name-brand merchants assure you of top-quality merchandise.

Make the CompuServe Electronic Mall 15-Minute Comparison Test.

What you can do in 15 minutes shopping the Electronic Mall way.

- Call up on your computer screen full descriptions of the latest in computer printers, for instance.
- Pick one and enter the order command.
- Check complete descriptions of places to stay on your next vacation.
- Pick several and request travel brochures.
- Access a department store catalog and pick out a wine rack, tools, toys... any thing!
- Place your order.

What you can do in 15 minutes shopping the old way.

- Round up the family and get in the car.

The Electronic Mall, a valuable addition to the vast world of CompuServe.

CompuServe's Consumer Information Service brings you shopping information, entertainment, personal communications and more.

You can access CompuServe with almost any computer and modem, terminal or communicating word processor.

To receive your illustrated guide to CompuServe and learn how to subscribe, call or contact...

CompuServe

Consumer Information Service
P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, OH 43220

800-848-8199

In Ohio call 614-457-0802

CIRCLE 310 ON READER SERVICE CARD

An H & R Block Company

THE SMART CABLE

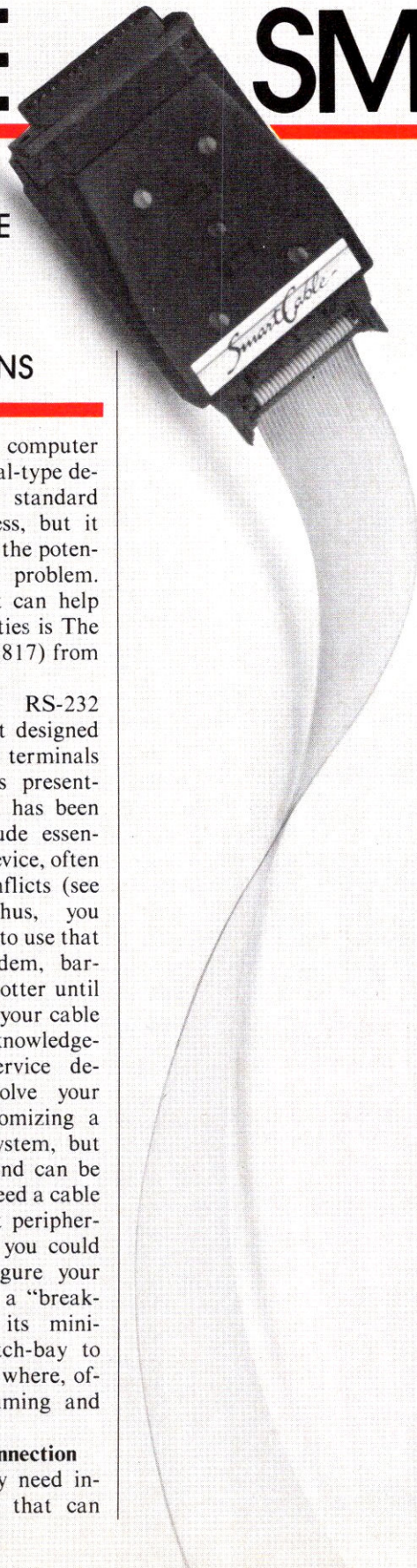
A CABLE FOR ALL REASONS

Hooking up your computer to an RS-232 serial-type device should be a standard and simple process, but it unfortunately has the potential to become a problem. One product that can help you avoid difficulties is The Smart Cable (SC 817) from IQ Technologies.

Because the RS-232 standard was first designed for connecting terminals with modems, its present-day usage, which has been extended to include essentially any serial device, often creates signal conflicts (see "RS-232C"). Thus, you might not be able to use that new printer, modem, barcode reader, or plotter until you've ironed out your cable connections. A knowledgeable computer-service department can solve your problem by customizing a cable for your system, but that takes time and can be expensive if you need a cable for each different peripheral. Alternatively, you could attempt to configure your own cable or use a "break-out box" with its mini-switches and patch-bay to decide what goes where, often a time-consuming and tedious process.

Enter a Smart Connection

What you may need instead is a cable that can



sense the various data, control, and handshaking signals and then make the proper connections between any RS-232 computer and its peripherals. IQ Technologies claims that The Smart Cable fills the bill, calling it "the only cable you need to own."

The Smart Cable does indeed live up to the bold claims the company has made for it. It uses its on-board logic to determine which lines need be connected to provide the necessary handshake, control, and data signals. Best of all, it accomplishes its functions automatically, at rates of up to 19.2K baud (19,200 bits per second), while being completely oblivious of word length and error and data codes.

**THE SMART CABLE
IS ONE OF
THOSE SIMPLE
DEVICES
THAT COULD BE
WORTH ITS WEIGHT
IN GOLD.**

Theory of Operation

The Smart Cable matches all a computer's handshake lines for a specific application in addition to the CTS (clear to send), RTS (request to send), and DSR (data set ready) lines to the corresponding lines of a peripheral. It does so in a three-part process. First a

"test" circuit characterizes the two interfaces to which it is connected, and the "pattern comparator" circuit determines the correct interconnection pattern the application requires. Only then does the Smart Cable activate the appropriate "interconnect circuits" to complete the connection of the two interfaces (see figure 1).

This product requires only about a one-milliamp draw from each DSR, DTR, CTS, and RTS line, a negligible amount.

Installation and Operation

You can connect the Smart Cable in three easy steps. (1) You plug one end of the cable into its "logic module," and then plug the module into the computer. You connect the other end of the six-foot-long cable to the peripheral's RS-232 port, using either the male or female connector as needed. (2) You set the top switch on the module so that both of the top lights glow. (3) You set the bottom switch in the center position; if one of the bottom lights glows, you simply slide the switch toward that light. The setup is then complete.

Troubleshooting with the SC 817

In the center of the module is a red LED (light-emitting diode) that glows to indicate conditions that could disable data transfer. You can single out the offending device by simply attaching the Smart Cable to only one device at a time and observing the red LED, which lights up when the cable is attached to the offending device.

SMART CABLE 817

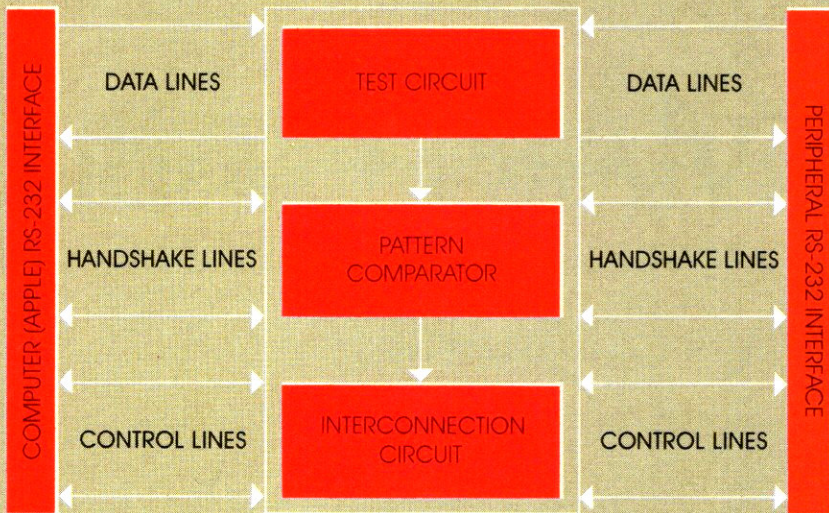


Figure 1: How the Smart Cable connects two RS-232 devices

▶▶ DIRECTION OF DATA FLOW ▶▶

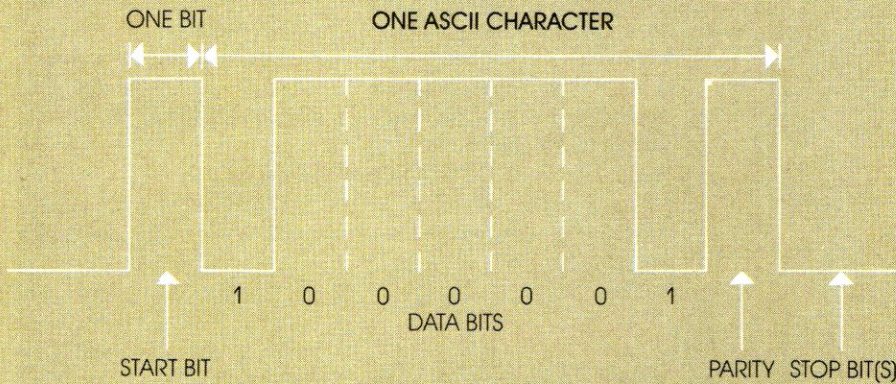


Figure 2: Serial transmission of one ASCII character

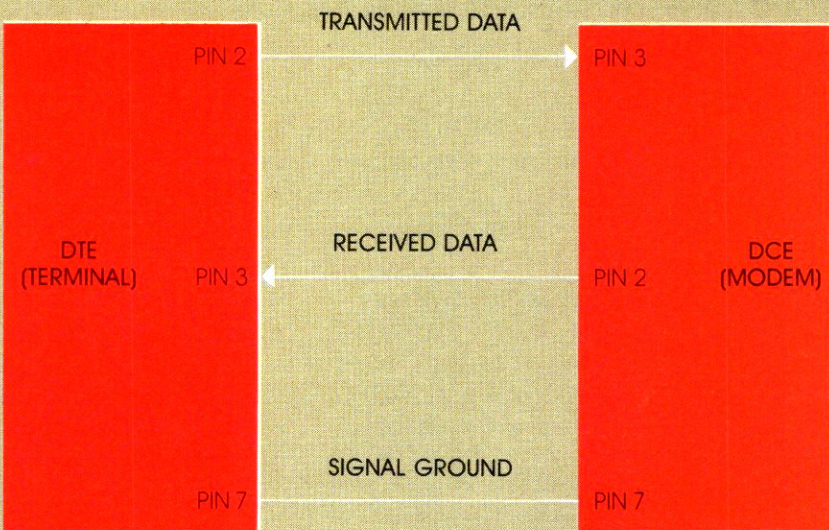


Figure 3: The minimum number of wires necessary for an RS-232 serial connection

Nice to Have at Hand

The Smart Cable is one of those simple devices that could be worth its weight in gold. With it, whether you're configuring a business system, demonstrating new equipment to a client, trying out a friend's modem, or just buying yourself a new printer, you can be certain that you'll always have the correct RS-232 connector close at hand. This product makes using a standard what it should be—no problem. +

▶ PRODUCT INFORMATION

Smart Cable (SC 817)

IQ Technologies, Inc.
11811 N.E. First Street
Bellevue, WA 98005
(206) 451-0232

List Price: \$89.95

Application: Between any two devices with RS-232 serial ports, specify male or female connector for the module end. Available for \$175 is the Smart Cable 821, an enhanced version of the 817 with dual (male and female) connectors at both ends, as well as additional LEDs to indicate the status of the DTR, DSR, CTS, and RTS lines.

▶ RS-232C

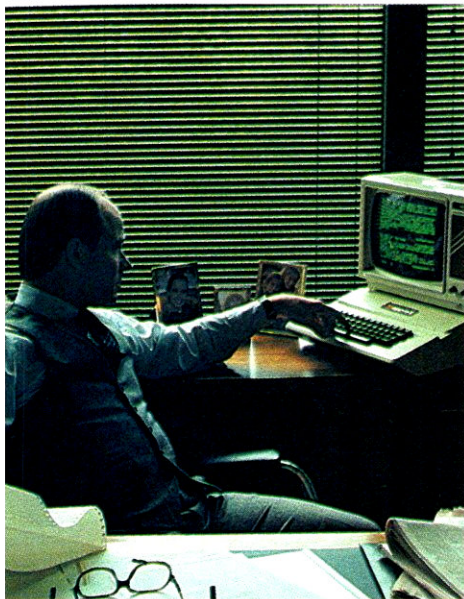
The RS-232 serial-communications protocol was originally designed to connect terminals, called "data-terminal equipment" (DTE), with modems, called "data-communications equipment" (DCE).

In serial communications each bit is transmitted consecutively over a single line (see figure 2), in contrast to parallel communications, in which several bits are sent simultaneously over more than one line.

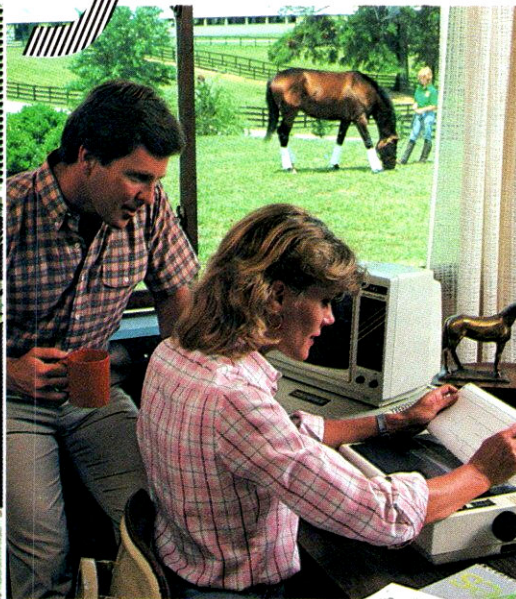
The DTE sends to the DCE over line number 2, and line number 3 carries the data flow from the DCE to the DTE; line number 7 is the ground for both signals. These three lines make up a basic RS-232 interface (see figure 3).

The standard RS-232 connector is a DB-25 connector, which has 25 assigned lines. If these lines need configuring for a DTE or DCE, you can have problems connecting two RS-232 ports to each other.

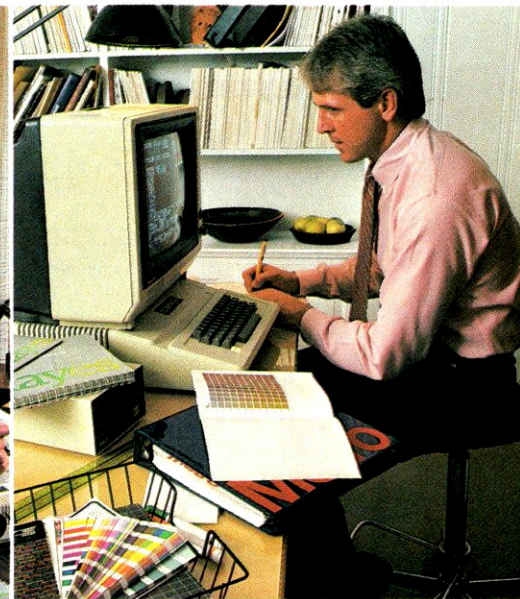
Your Apple's telephone. Hayes™



"Thanks for the prompt reply. Sure was a lot faster than waiting for the mail!"



"Gary: The pedigrees for next week's auction are as follows..."



"Attn. Prod., Sales, Purch.: Recommend 50% blue, 30% red screen for closest match!"

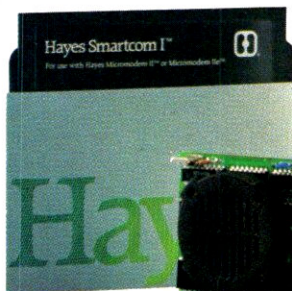
A complete plug-in communications system for Apple® computers. From Hayes, the established telecomputing leader: the simple but sophisticated Micromodem II® plug-in board modem and its companion software, Smartcom I.™ Everything you need to expand the world of your Apple II, IIe, II Plus and Apple III. In one, convenient communications package.

With Micromodem II and Smartcom I, you can access data bases, bulletin boards, and the varied resources of information services. Plan your travel itinerary via computer, including flight numbers, hotel and rental car reservations. Retrieve and analyze daily stock and options prices. Work at home and send reports to your office. You can even do your gift shopping by computer!

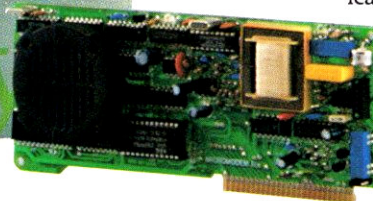
Micromodem IIe. Think of it as your Apple's telephone. It allows your computer to communicate with any Bell-103 type modem over ordinary telephone lines, at 110 or 300 bits per second. Micromodem IIe installs easily in an expansion slot, and requires no outside power source. It connects directly to either a single or multiline modular phone jack, to perform both Touch-Tone® and pulse dialing.

Micromodem IIe dials, answers and disconnects calls automatically. And, unlike some modems, it operates in full or half duplex, for compatibility with most time-sharing systems.

A built-in speaker lets you monitor your



Micromodem IIe
Smartcom I



calls when dialing. That way, you'll know if a line is busy. With Smartcom I, Micromodem IIe automatically redials your last number.

Discover how Micromodem IIe can help maximize the capabilities of your Apple. While Smartcom I software will minimize your efforts.

Smartcom I companion software.

For effortless communications. Whether you're a newcomer to personal computing or a seasoned professional, you'll appreciate the ease and speed with which you can perform any communications function. Thanks to Smartcom I!

Let Smartcom I guide you through a few easy-to-answer questions to tailor the program to your particular needs. Then you're ready to go!

Make a selection from the Smartcom I menu to manage your communications, files or printer. Program prompts guide you along the way. And menu selections let

you easily make a call, end a call, or answer a call. When you're on the receiving end, your Micromodem IIe answers automatically, even if you're not there!

Convenient! And so is the Smartcom I memory for phone numbers. Smartcom I stores three of your most frequently called telephone numbers and one prefix. Plus, it also remembers the last number dialed.

Smartcom I also provides a directory of the files stored on your disk.

And lets you create, list, name, send, receive, print or erase files right from its menu.

Smartcom I is as versatile as you need it to be. It accepts DOS 3.3, Pascal, CP/M™ 3.0 or CP/M Plus™ operating systems. And accommodates up to six disk drives and several printer interface cards.

Like all our products, Smartcom I and Micromodem IIe are backed by excellent documentation and full support. Including a two-year limited warranty on Micromodem IIe and a 90-day warranty on Smartcom I!

See your dealer today. Then plug into the exciting world of telecomputing.

Hayes Microcomputer Products, Inc.,
5923 Peachtree Industrial Blvd., Norcross,
Georgia 30092. 404/441-1617.



FCC approved in U.S.A. Micromodem IIe is a registered trademark of Hayes Microcomputer Products, Inc. Smartcom I is a trademark of Hayes Microcomputer Products, Inc. Apple is a registered trademark of Apple Computer, Inc. Touch-Tone is a registered service mark of American Telephone and Telegraph. CP/M is a trademark of Digital Research, Inc. CP/M Plus is a trademark of Advanced Logic Systems. ©1983 Hayes Microcomputer Products, Inc.

THE GRAPHICS MAGICIAN

This programming aid helps game-software sorcerers conjure up picturesque graphics.

The Graphics Magician
Penguin Software
P.O. Box 311
Geneva, IL 60134
(312) 232-1984

List Price: \$59.95

Requires: 48K; Apple II, II Plus, or IIe; one disk drive; paddles, joystick, Koala Pad, Apple Graphics Tablet or Houston Instruments Hipad.

Software sorcerers who have visions of creating a best-selling computer game can find programming graphics tedious, time-consuming, and difficult. What they need is some sort of electronic incantation to dispel programming drudgery and conjure up charming graphics. Better yet, this electronic enchantment should combine speed, text, special effects, and minimum storage requirements in an easy-to-use format. Fortunately, such a graphics package exists.

The Graphics Magician is a programming aid that provides a set of graphic editors and machine-language routines to help users design and control fast animation of many independent objects and also draw full-screen graphics. It is divided into an animation system and a picture system.

Designed with the game programmer in mind, the animation system features "preshifted" shapes; that is, each shape has seven facsimiles stored as bit patterns. Since one byte of the screen contains seven bits, or dots, each bit pattern is shifted over one dot from the last with respect to the byte boundaries. The animation routines check a particular

shape's x-coordinate and then select the bit pattern that fits the proper byte boundary. This storage scheme speeds and smooths horizontal movement and is the basis of fast animation in all professional arcade games.

The animation system comprises a shape editor, path editor, animation editor, and documentation utility. You need to use the keyboard for accurate, cursor-controlled input.

The shape editor allows you to create new shapes or alter shapes previously stored. Most of the time, the shape appears against a black background, although you can change the background color to white, green, orange, violet, or blue. You must set the height and width

► **With the press of a single key, you can flip a shape upside down or from left to right, or rotate it 90°.**

parameters of the shape. The maximum is 256 bytes, and 36×42 dots, but enlarging the shape slows its movement and takes up more memory. You must also assign a border to each shape. This border governs how fast each of the seven facsimiles appear within the byte boundaries. You can set the border from zero to seven—the larger the number, the faster the shape moves across the screen.

Seven frames, equal to the height and width parameters, appear on the screen, each overlined with an orange marker. As you create a shape in the first frame by manipulating the cursor up, down,

left, and right, each frame with an orange marker reproduces the shape exactly. By turning the orange markers on and off, you can create seven sequenced frames that detail a shape's individual movements, such as flapping wings, flickering flames, or rolling boulders.

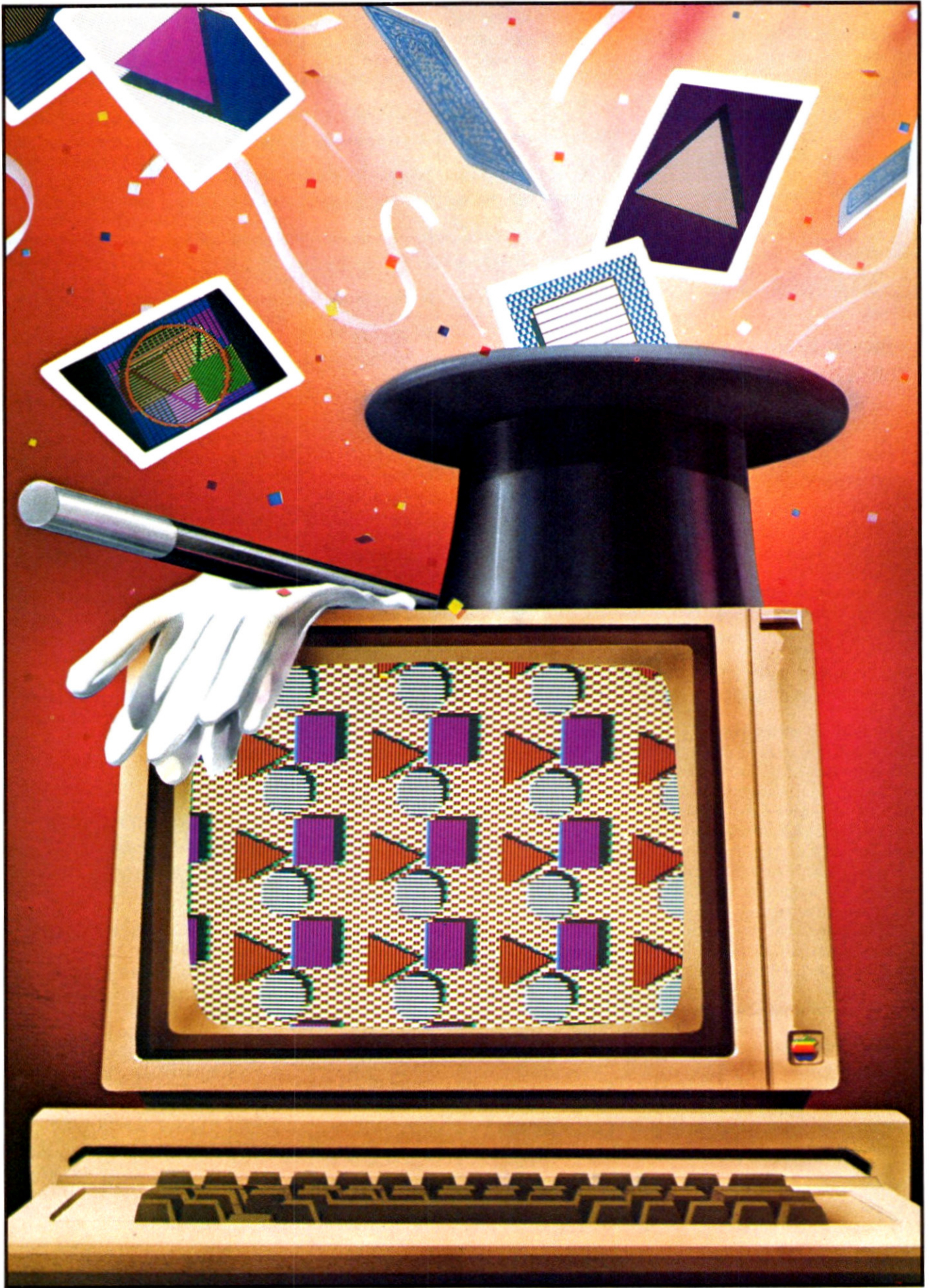
One quirk you can find when using the shape editor concerns frame sequencing. Changing the border number changes the frame sequence. At the default setting of 2, frames run 1,2,3,4,5,6, and 7. If you reduce the border number to 1, the frame sequence changes to 1,5,2,6,3,7, and 4. Consequently, you must remember the order of the frames when using the shape editor. Furthermore, you cannot switch individual shapes from frame to frame—this makes remembering the frame sequence doubly important.

The shape editor contains some shortcuts in basic shape creation. With the press of a single key, you can flip a shape upside down or from left to right, or rotate it 90°. You can also shift the shape within the height and width parameters, giving it a little hop, dip, or sustained vertical movement.

You can make the shape any combination of colors, but beware the idiosyncracies of the Apple, such as only plotting green and orange in alternate columns, or not plotting green next to orange or blue within the same byte. Fortunately, blending colors and using a color palette can alleviate some of these aspects.

Once you are satisfied with the shape, you can test how all seven frames look in sequence. The shape travels from left to right, then from right to left, across the bottom of the screen. You can edit whatever anomalies appear by reentering the frames and altering the shapes. The shapes are then saved on disk.

The path editor allows you to draw



preset paths for your shapes over a background picture. As with the shape editor, you select the path by manipulating the cursor. Up, down, left, and right use the I, M, J, and K keys respectively; and diagonal movement occurs with the U, O, comma, and N keys. Pressing D deletes the last command, and C clears the entire path and lets you start again.

The path editor can move a shape from one to seven dots at a time, or register a pause. Because of the idiosyncrasies of the Apple, however, if a shape has a color other than white or black, you must set horizontal movement in multi-

▶ Block type is the simplest, fastest, and easiest to learn, and it requires the least amount of memory.

ples of two to retain the color. The shape always keeps its proper color when moving vertically. Paths are saved on disk.

The animation editor lets you combine up to 32 shapes and 32 paths on one screen. The "screen" is actually 6.4 screens wide and wraps around, so a shape traveling in a straight line off the right side eventually appears on the left side.

You load the appropriate shapes and paths and assign each shape a starting coordinate and path. Each shape can have its own path, share paths with other shapes or can have a combination of the two. You can assign or end paths with a single keystroke. You can test how shapes and paths work together, edit any aspect of this animation sequence and change animation types.

The Graphics Magician contains four animation types: Block, Xdraw, Block with Background and Block with Background Xdraw. Block type is the simplest, fastest, and easiest to learn, and it requires the least amount of memory. It has two disadvantages. It does not detect collisions between shapes—for example, between a missile and a spaceship—and if a shape travels across a multicolored background, the shape erases the background as it moves.

The Xdraw type displays a shape by reversing the background on the screen, then rereverses it to restore it. If a shape is put on a black background, the shape appears as you drew it, but on a white background, the shape appears in negative form. If you place it on a color back-

ground, you lose some detail from both the shape and background. Xdraw registers collisions and won't erase the background, but shapes suffer a slower speed and slight flicker.

For most applications, you should use the animation type Block with Background. It works in the same way as Block but also detects collisions between a shape and background object and restores a background crossed by most shapes. Some shapes, since they are created using Block type animation, erase the background.

Block with Background Xdraw solves Block with Background's minor problem of some shapes erasing the background, but it decreases the speed of the program.

The Documentation utility is not necessary to create graphics but comes in handy at times. It lists all the shapes, paths and memory locations of all animation and allows you to delete unused shapes and paths. You can send all information to a printer for a hard copy.

The picture system for drawing full-screen graphics features "sequential pictures." That is, the computer stores the commands used to draw the picture instead of saving the picture itself. Full-screen pictures take 8K, or about 8000 bytes, of storage, but the drawing commands can be saved in hundreds of bytes. This space-saving feature lets you fit between 50 and 100 pictures per disk side rather than just 12 8K pictures.

The picture system starts with a clean screen. You enter data by using the keyboard, a joystick, paddle, trackball, or Apple Graphics Tablet. You can load a previously stored picture or draw a new one. You switch between a selection screen, which lists all drawing commands and options, and the actual picture by pressing the space bar.

The four drawing commands are easy to learn and use. You can draw a line, type uppercase and lowercase letters in standard or reversed text, fill an area with color, and color individual portions of the screen. You can choose from a palette of over 100 color mixes.

You can test your artwork by pressing R for redraw, which reconstructs the picture as it would appear in a program. The Edit mode allows you to add or delete single commands anywhere within the drawing sequence.

The Graphics Magician is a flexible programmer's aid, and you must, repeat must, do some programming to create a game. The pictures, shapes, and paths are placed in memory or on disk, and you must write routines to call and con-

trol the artistry on the screen. The programming can be as simple as a four-line BASIC routine to display a single shape, or as complex as machine-language routines manipulating multiple shapes over many pictures. By essentially doing most of the graphics routines for you, The Graphics Magician significantly reduces the amount of programming needed to create a game. Note that The Graphics Magician is geared primarily for game animation. Although you can draw graphs, tables and charts for business applications, other programs are available that perform those functions faster and more efficiently.

You can program several tricks into a game using The Graphics Magician. You can control shapes using a joystick or keyboard. You can place invisible shapes on the screen to be activated only when another shape collides with them. Similarly, shapes can disappear when hit or be picked up and transported from screen to screen. Since most of these tricks are standard game fare, The Graphics Magician can dramatically decrease the time needed to program them.

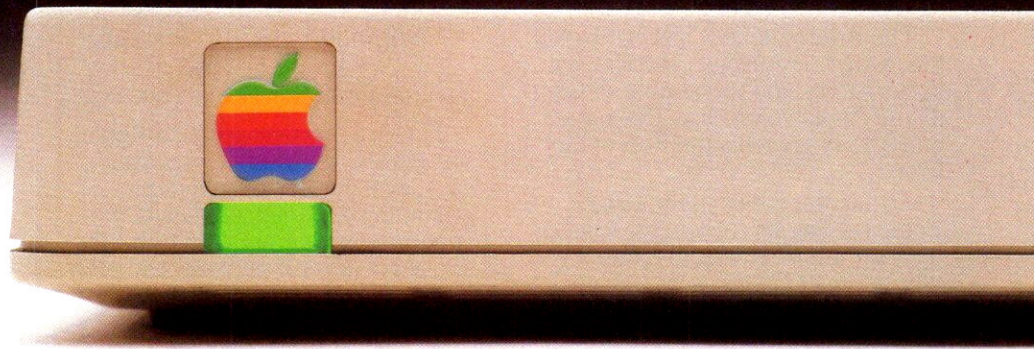
The 78-page manual contains thorough step-by-step instructions and explanations on how to use The Graphics Magician. The booklet is filled with programming hints and examples and written in a clear and straightforward style. It contains abundant technical information about memory addressing, which you may or may not ever use, but might find handy anyway.

▶ You can program several tricks into a game using The Graphics Magician.

The Graphics Magician comes on a copyable disk, and your own programs can access all routines. If you use any of The Graphics Magician's copyrighted routines in your own commercial programs, you must obtain a license, which carries no fee, from Penguin Software.

The Graphics Magician can help software sorcerers dispel the tedium involved in conjuring up picturesque graphics. Fast, simple, and versatile, it offers a cornucopia of features for advanced-machine-language programmers, as well as BASIC apprentices. The Graphics Magician could well become a programming wizard's most powerful talisman. **+**

Something no modem has ever said before.



If you're looking for a premium modem without a premium price, here's a word of advice: Apple.

Introducing the Apple® Modem 300. And, to keep up with the business world, our faster Apple Modem 1200.



As you'll notice, the Apple Modem is hardly noticeable under a desk phone.

And compatibility with all the latest advanced communications software.

But the real message is located outside, due north of the little green light.

That one familiar symbol tells you as much as a gigabyte of specs. It says Apple quality. Apple technology. And in the unlikely event you should need it, Apple service.

It also means total compatibility with whatever Apple you own. Particularly since we include the right accessory kit to get any system in our line on line. Immediately.

We even give you a subscription offer to THE SOURCESM and a free demonstration of CompuServe.[®] Together, they let you access almost any subject known to mainframes.

Inside, they're packed with all the technical wizardry you would want in an intelligent modem. Auto-dial. Auto-answer. Built-in error diagnostics.

News reports. Dow Jones averages. Sports scores. Closing prices on pork bellies.

You can send electronic mail. Play games. Bank at home. Make friends. Influence people. Find the lowest air fares for business trips. Or do almost anything else you like.


And since the computer age happens to coincide with the plastic age, you can charge your Apple Modem with an Apple Credit Card.

Which, along with the low price, makes buying an Apple Modem as much fun as using one.

That's something no modem has been able to say before, either.



The cable, phone cord and power supply are all included. And we offer a serial interface card for the Apple IIe at an unusually reasonable price.

Soon there'll be just two kinds of people. Those who use computers. And those who use Apples. 

The Pick of the Crop

The Brady Co. now has on display the tastiest, crunchiest, and shiniest books for you and your Apple. Among all the Apple volumes on the market, only Brady presents the Pick of the Crop.

To harvest the best, the Brady Company begins early in the season by choosing with care, the authors who are the experts in the personal computing field. They are also the writers and teachers with the most experience with the Apple.

They're then set to work under the optimum creative climate, so they can write the books you'll want to read. The Brady Co. publishes their work in attractive, durable volumes, giving you a nourishing product at an affordable price. The result is an Apple book as good on the inside as it looks on the outside, with enough great taste to stay with you for a long, long time.

CIRCLE 225 ON READER SERVICE CARD

"Applesoft BASIC for the Apple II/IIe"

by Lois Graff, Larry Joel Goldstein

This is a practical guide to Applesoft BASIC which makes learning easy, even for those without programming experience. Most of the applications programs can be easily applied to specific personal and professional needs.

1983/320pp/paper/ISBN 0-89303-320-0/
D3200-5/\$17.95

"Apple Graphics: Activities Handbook"

by Harold J. Bailey, J. Edward Kerlin

Here's a "hands on" approach to learning both low and high resolution graphics for the Apple. Step-by-step, users will learn by doing. The graphics novice and the more sophisticated graphics user will find just the right activities to maximize the graphics capabilities of the Apple II and IIe.

1983/300pp/paper / ISBN 0-89303-308-1/\$14.95
Book/Diskette 1983/ISBN 0-89303-310-3/\$24.95

"Programming the Apple II and IIe; A Structured Approach, Revised and Enlarged"

by John L. Campbell, Lance Zimmerman

This is the guide that will take you down the right path to programming your Apple in BASIC. The approach presents the BASIC language as a problem-solving tool, which gives you quick, easy, and useful results. It shows how to more effectively write programs starting simply then proceeding to more complex ideas.

1984/650pp/paper/ISBN 0-89303-779-6/\$17.95

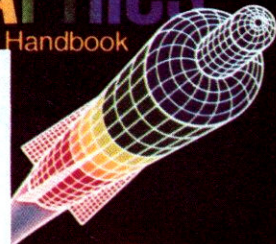
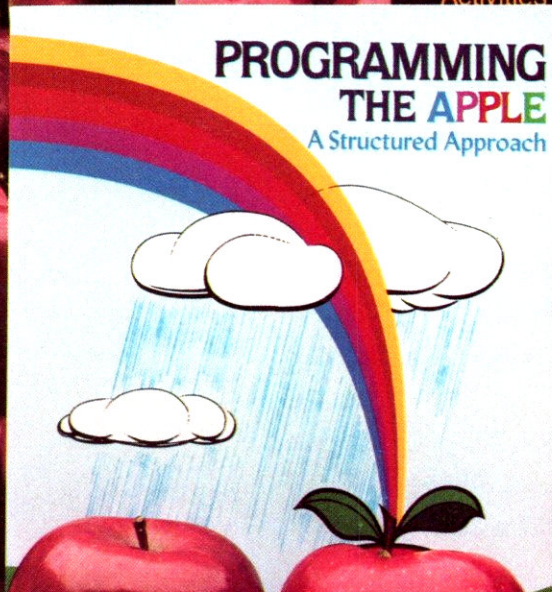
Make your selection for your Apple II or IIe from the Pick of the Crop at B. Dalton Booksellers, Waldens, Crown Books, and other fine bookstores and computer dealers nationwide. Or call, 800-638-0220 for information. The Brady Co. is a Prentice-Hall Company, located in Bowie, MD 20715.

BRADY

**APPLESOFT
BASIC** for the Apple II & IIe

**APPLE
GRAPHICS**
Activities Handbook

**PROGRAMMING
THE APPLE**
A Structured Approach



VIZ-A-CON AND VIZ-A-MERGE

Now you can combine a series of spreadsheets into a single Summary and move information from one spreadsheet to another.

If you have an application that requires a combination of data from several spreadsheets, take a look at two new programs from Abacus Associates: Viz-A-Con and Viz-A-Merge.

The programs both work with VisiCalc, the grandfather of all electronic spreadsheets. Since its introduction five

► **Combining information from one spreadsheet with that of another can be especially difficult.**

years ago, VisiCalc has outsold all other business programs, becoming the most popular piece of nongame software in history.

VisiCalc owes much of its success to the program's ease of use; even a non-technical person can use the system with a minimum of instruction. VisiCalc makes many traditionally tedious business and financial calculations easy, while also permitting development of many new series of figures.

After using VisiCalc (or a compatible program) for a while, however, you learn its limitations. Combining information from one spreadsheet with that of another can be especially difficult. Although it is not impossible, moving data from file to file can be so time-consuming that it often isn't worth the trouble.

Program Description

Viz-A-Con combines a series of

spreadsheets into a single summary. For example, if a retailer uses VisiCalc to prepare daily sales reports showing totals per salesperson and department, he can use Viz-A-Con to combine these separate records into one file. Every 30 days, Viz-A-Con can add a full month's worth of reports, giving a monthly sales summary.

The concept behind Viz-A-Con is simple; you specify which files you want combined, and the program adds up the same locations from each file. Think of it as though you had stacked the files one upon the other, adding a third dimension to your spreadsheets. Row 4, column 2 of one file combines with row 4, column 2 of the others, and so on throughout the spreadsheet. The sums are stored at the same locations in the finished product.

The program uses the labels of the first file specified for consolidation on the final version, ignoring all other labels. You lay out this first "format file" so it looks like the final product you have in mind. Using our example of a monthly sales report, the first file in the group might have headings such as Monthly Sales Totals:, and these would be the only labels to appear on the summary.

Each run of the program consolidates as many as 50 files. Larger numbers of files are processed in groups; after processing them, the program can combine the resulting files. With Viz-A-Con, you can actually process any number of files.

Viz-A-Merge resembles Viz-A-Con in that it combines data from several spreadsheets into one. Viz-A-Merge is different in that it takes information from *any part* of one spreadsheet and places it at any part of another. Abacus Asso-

ciates refers to this process as a cut-and-paste operation, where information is "cut" from one file, and is "pasted" at the desired location of another.

A typical application for Viz-A-Merge consists of preparing a company's budget projection. Data from various departments can be taken from individual reports and merged into a company-wide analysis. You can add columns or rows to show the percentage of the total for each department.

Use DIF Files

To process files with either Viz-A-Con or Viz-A-Merge, you first store them to disk under the DIF (Data Interchange Format) from VisiCalc. DIF files differ from ordinary files in that they save the data itself, rather than the formulas used to calculate it. As the name implies, the Data Interchange Format allows various files or programs such as Viz-A-Con and Viz-A-Merge to share

► **The Data Interchange Format allows various files or programs such as Viz-A-Con and Viz-A-Merge to share (or interchange) data.**

(or interchange) data. The files these two programs produce are also in the Data Interchange Format, and you can load them from VisiCalc for further processing.

By answering prompts from the pro-

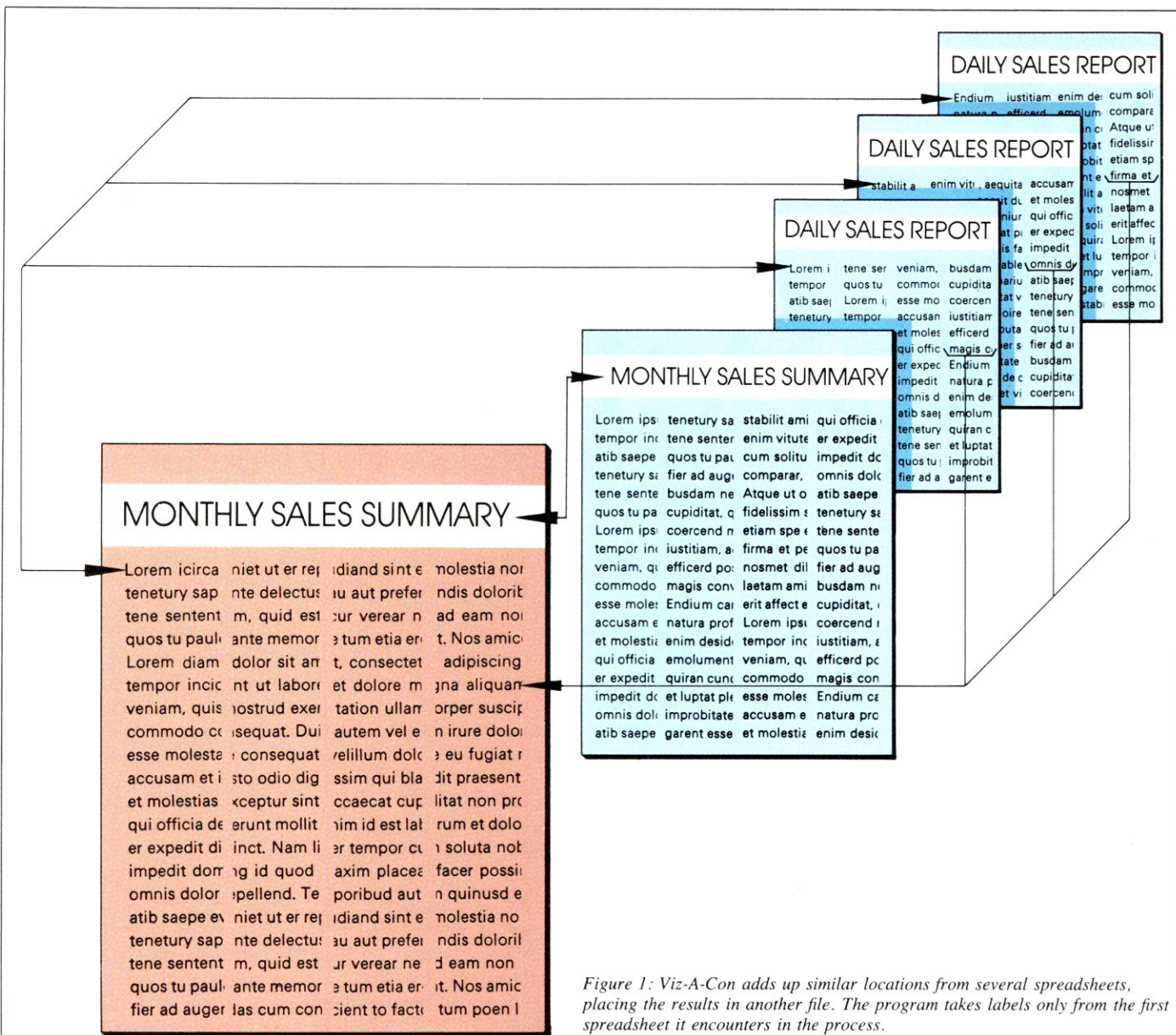


Figure 1: Viz-A-Con adds up similar locations from several spreadsheets, placing the results in another file. The program takes labels only from the first spreadsheet it encounters in the process.

gram, you can set up a consolidation process. You specify the files you want combined, making sure the first in line contains the labels you desire on the finished product. All of the files must have the same number of rows and columns in order for Viz-A-Con to work properly. Usually, these files appear identical except for the data itself.

After describing a process fully, you can save the steps involved. You need not go through the entire setup procedure for each consolidation; just run the appropriate routine. For example, you can save the steps you need to process a weekly sales summary in a file named Weekly Report and specify this whenever you want a weekly report. Another routine would be on hand to take care of the monthly report.

When the program completes a process, you can print the results immediately or save them as a DIF file for later

processing by VisiCalc. Although all of the information is there, it is not always desirable to print the data directly. DIF files have no format information, so data

▶ You can store data you produce with Viz-A-Con and Viz-A-Merge to disk in a format compatible with most word-processing programs.

cannot be justified or given with a certain number of decimal places (financial work, for instance, usually requires a data display with two decimal places). Passing the file through VisiCalc rapidly

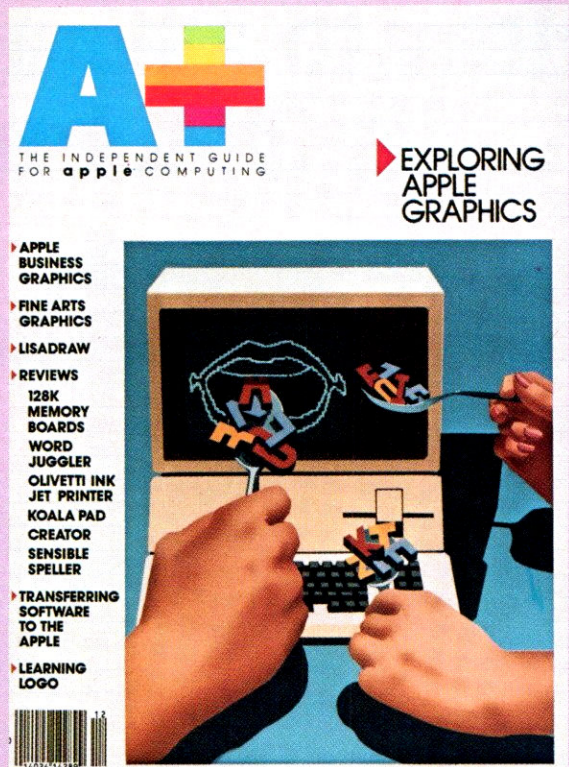
puts the final product into a more presentable form.

You can store data you produce with Viz-A-Con and Viz-A-Merge to disk in a format compatible with most word-processing programs. You may use as many or as few of the options as you want, depending on your particular needs.

Viz-A-Merge also requires you to store your data to a disk with the DIF option of VisiCalc. And, as with the other program, finished data is in the DIF form. You can print the final product directly or save it as another file giving VisiCalc or a word processor the ability to manipulate the data.

Setting up a merge process is complicated. In fact, you need to use a worksheet to plan the procedure. Since the program only includes one blank worksheet, you should make several copies of it before starting. On this sheet, you list the names of files that you want merged

TOP OF ITS CLASS



A+ ...THE MARK OF EXCELLENCE
 ...THE PINNACLE OF SUCCESS
 ...THE HEIGHT OF ACHIEVEMENT

Finally there is a magazine written exclusively for Apple II series and Macintosh users that can be called **A+**.

If you're looking for ways to expand the use of your Apple... if you're a doctor or lawyer and you want to computerize your practice... if you're a student and you need an Apple to organize your workload... or if you want to know more about games, **A+** is the *magazine for you!*

Business and Finance Applications, Product Reviews, Apples at Work, Apples and Learning and That's Entertainment are just a sampling of the features you'll find in **A+** month after month!

A+... TOP OF ITS CLASS.



The Independent Guide for **apple** Computing

4S093

YES, I want to save up to 33% on A+. Please enter my subscription for:

- | | | |
|--|---|---|
| <input type="checkbox"/> One year (12 issues) for \$19.97. I Save 20%! | <input type="checkbox"/> Two years for \$36.97. I Save 26%! | <input type="checkbox"/> Three years for \$49.97. I Save 33%! |
|--|---|---|

Savings based on full one-year subscription price of \$24.97.

Mr/Mrs/Ms _____ (please print name in full)

Company _____

Address _____

City _____ State _____ Zip _____

Check one: Payment enclosed Bill me later

Charge my: American Express Visa MasterCard

Card No. _____ Exp. Date _____

Add \$12 a year in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

A+ P.O. Box 2964 Boulder, Colorado 80322

How to make your Apple run 3½ times faster.

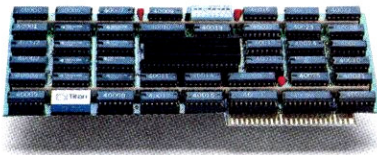


Just plug in the Accelerator II™ and watch your Apple® II, II Plus or IIe take off.

Imagine running VisiCalc®, DB Master®, Applesoft, Apple Fortran or Pascal without long delays. With the Titan Accelerator IIe, your Apple II, II Plus or IIe runs these programs a true 3½ times faster. The Accelerator IIe also runs your Franklin, Basis and other Apple II compatibles 3½ times faster. This faster computer response time means less waiting for you and an increase in your productivity.

This Titan exclusive has its own fast 6502 processor, 64K of high-speed memory, and built-in fast language card. It is transparent to your software and is hardware compatible with most standard peripherals. And you can turn it off from the keyboard to run your Apple at regular speed.

Find out how to run faster and increase your productivity without breathing hard. For information on the Accelerator IIe and other Titan products, see your computer dealer or contact:



 **Titan**
TECHNOLOGIES, INC.

310 West Ann Street, Ann Arbor, MI 48104
Telephone (313) 662-8542

Apple is a registered trademark of Apple Computer Inc.
VisiCalc is a registered trademark of VisiCorp.

DB Master is a registered trademark of Stoneware, Inc.
Accelerator IIe is a trademark of Titan Technologies, Inc.

Sales and Marketing by The MARKETING RESOURCE GROUP, Fountain Valley, CA.

CIRCLE 179 ON READER SERVICE CARD

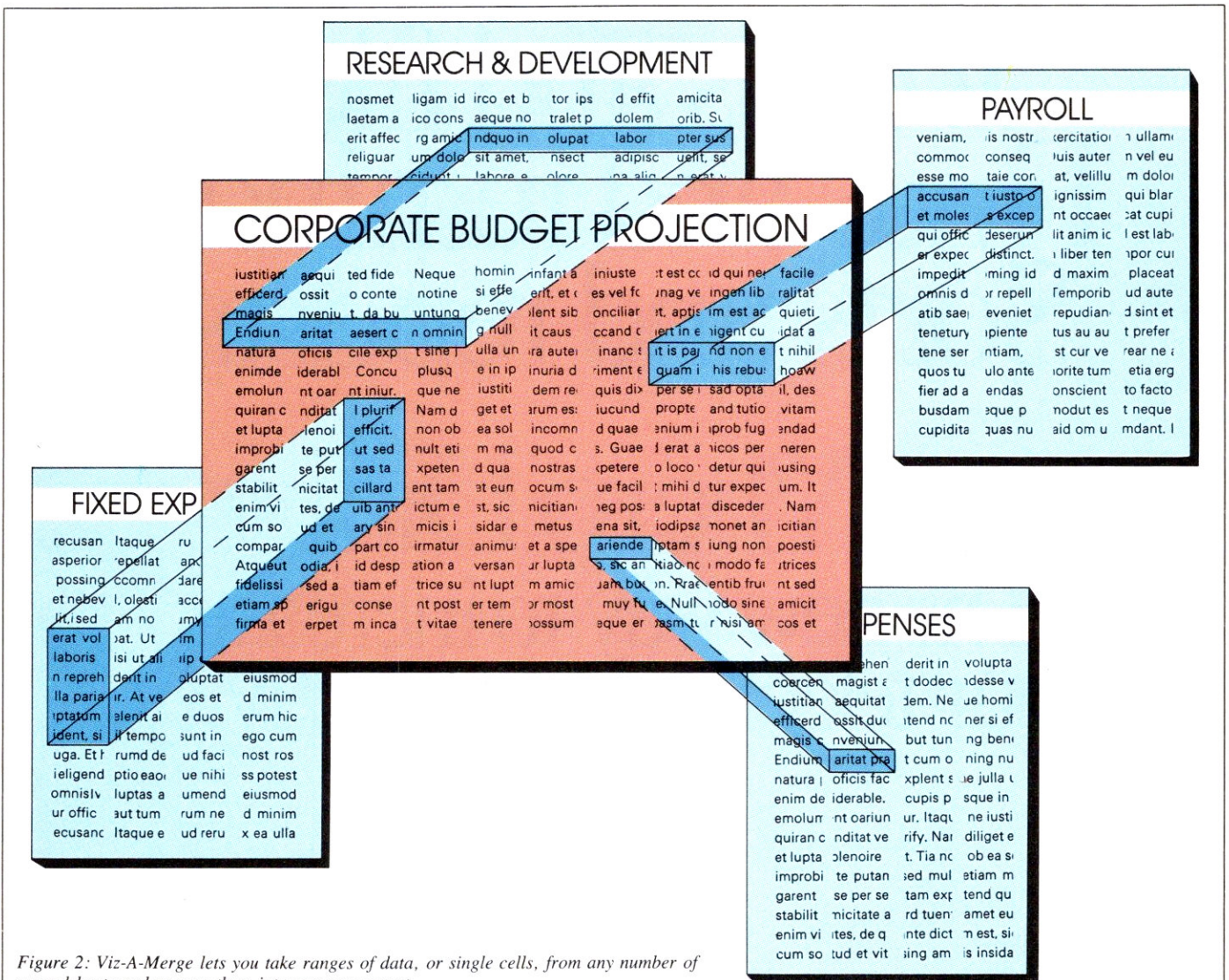


Figure 2: Viz-A-Merge lets you take ranges of data, or single cells, from any number of spreadsheets and merges them into one new report.

and the parts of the files that you want to use. If a file named Research Expenses contains the department budget totals in column 5, rows 3-9, you list the file-

▶ **Though the manual definitely needs revision, it does contain the pertinent information.**

name on your worksheet along with these coordinates.

Next, list *where* you need this data range on the destination file. The specified destination indicates where the first cell of the group is to be stored; the program puts the remaining cells in the order in which they emerged from the source file.

Once you list the filenames, the source locations, and their destinations on the worksheet, Viz-A-Merge saves

your information. After laying out a process, you can save the steps and use them later on, without reentering the worksheet.

Documentation

The manuals for these programs come in full-size loose-leaf binders, with index tabs for locating various sections. The documentation style, however, does little to clarify the procedure. Unless you already have some experience with this type of program, the manuals will not provide you with much assistance. Several difficult concepts should be clarified with illustrations in future versions. Even though the manual definitely needs revision, it does contain the pertinent information; it is just a bit hard to locate.

Comments

Both Viz-A-Merge and Viz-A-Con performed as promised, and I found the setup procedure quite easy, once I got the hang of it. I was suddenly able to do some of the things that I had always wanted to do with VisiCalc but had

thought impractical.

If you occasionally wish you could do more with VisiCalc, these routines may be just what the doctor ordered.

Before you consider either program, you should be familiar enough with VisiCalc that terms such as *DIF files* do not intimidate you. In order to derive the most benefit from these enhancement routines, you first need a thorough understanding of VisiCalc itself.

With Viz-A-Con and Viz-A-Merge, experienced VisiCalc users can combine data more efficiently. **+**

▶ PRODUCT INFORMATION

Viz-A-Con and Viz-A-Merge

Abacus Associates
6565 West Loop South
Suite 240
Bellaire, TX 77401

List Price: \$99.95 each for Apple II version; \$139.95 for Apple III version
Requires: Apple II, II Plus, IIe, or III; VisiCalc; one disk drive

It dials and files. Finds and reminds. Sorts and reports.

It's Micro Diary. The new way to increase your telephone productivity.

If you use the phone for business or pleasure, we can save you a lot of time. Just connect the telephone Micro Diary to your phone and computer, and you're in business with the smartest system going.

A powerful, electronic telephone directory stores 2,000 names, numbers and addresses. It finds the phone number you need and dials it automatically—including those toilsome, long-distance access codes. And with a special note-filing feature, you can put extra information with each directory listing, including contact names and key information.

The telephone Micro Diary is also strong on follow-up, maintaining your daily calendar of activi-

ties, plus a tickler file to call your attention to important matters.

And there are many more features. A mystery phone number finder to help reconcile monthly phone bills.

Sorts by phone numbers or by names. Printing too—your entire directory, calendar, notes, even mailing labels. The telephone Micro Diary is

easy to install and use on practically any phone and most popular microcomputers.

See your dealer for details or contact: Wesper Microsystems:
14321 New Myford Road, Tustin, CA 92680,
(714) 730-6250. Telex 4720629.

Sales and Marketing by The MARKETING RESOURCE GROUP



**WESPER
MICROSYSTEMS™**
A WESPERCORP COMPANY
CIRCLE 364 ON READER SERVICE CARD

POINTING A FINGER AT MUSIC

A winning combination yields a big sound at a small cost.

Music Construction Set

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

List Price: \$40

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive. Mockingboard Sound II is recommended

Mockingboard Sound II

Sweet Micro Systems, Inc.
50 Freeway Drive
Cranston, RI 02910
(401) 461-0530

List Price: \$129 (less \$25 with coupon included in Music Construction Set)

Requires: Apple II-series computer (or equivalent); two 8-ohm speakers

Until recently, obtaining a decent musical sound from an Apple involved expenses most owners found prohibitive. Now the Music Construction Set and the Mockingboard Sound II card, a pairing of software and hardware, offer amateur composers an affordable, listenable solution.

Only about five years ago, Apple owners and their friends were impressed by a little program called Applevision. Written by Bob Bishop, it came on the DOS 3.2 and 3.3 System Master diskettes. It served well as an introduction to the Apple's music and high-resolution animated-graphics capabilities. Applevision was by no means a dazzling product, but home computerists were less demanding in those days, and when the program drew a simple hi-res room with a TV on a table, faces lit up. Bishop's

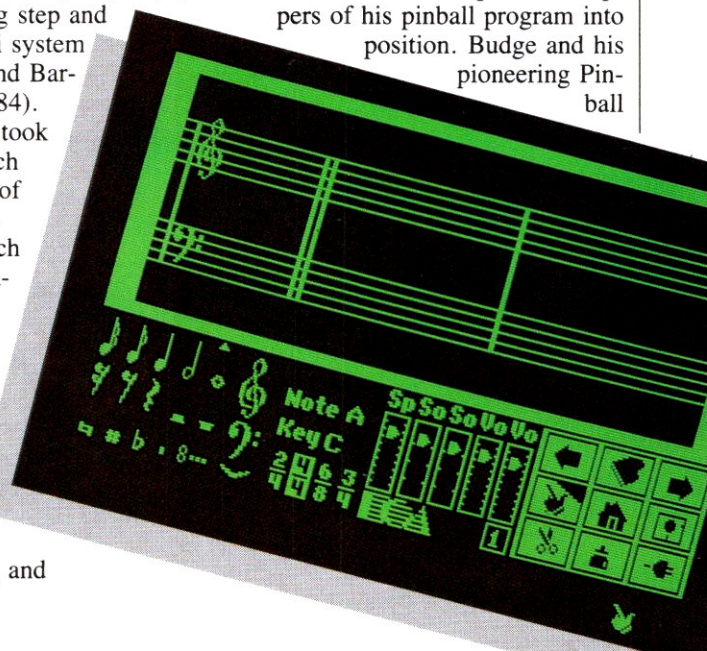
pièce de résistance, however, was a little man who appeared on the screen-within-a-screen and danced to "Turkey in the Straw." The little man, made of a handful of pixels, showed us the Apple II's graphics and sound potential.

Bishop's man looks primitive now, and the simple strains of his music have long since been surpassed by such programs as Paul Lutus' Musicomp and Electric Duet, which have the Apple generating two-voice music of remarkable quality. Walter Marcinko, Jr., employed the latter program to create The Music Disk, which contains a large and extraordinarily well-rendered repertoire ranging from Scott Joplin's "The Cascades" to Chopin's "Valse Brillante." Still, there is only so much the tiny Apple speaker can do, and although connecting an outside speaker to your system yields better sound quality, the clicks are still audible, and the two-voice limitations remain.

One solution is to add a synthesizer board, such as the ALF Synergizer; another is to take the big step and plug in an alphaSyntauri system (see "Breaking the Sound Barrier," *A+*, February 1984). Pianist Herbie Hancock took the latter route with much success—witness some of his fusion albums of recent years. Although such attachments as the alphaSyntauri can turn a beeping Apple into a professional musical instrument, its high cost (starting at \$1295) is prohibitive. Don't worry—there are less draining ways to produce respectable music from your Apple, and

although it admittedly is not ready for performances at Carnegie Hall or the Hollywood Bowl, the Music Construction Set (MCS)/Mockingboard combination is a fairly inexpensive way to create listenable computerized music.

Similar programs and peripheral cards (e.g., Applied Engineering's Super Music Synthesizer) are available, but none is more fascinating to work with than MCS. The figure below shows a working screen of this program. The work screen contains most of the symbols available and displays the current status of each tune, as you load it. The nine icons are in the lower right corner; the "beat counter" is to the left of the scissors. Using the keyboard shortcuts to call up notes and rests is easy because they are in numerical order. Thus you can produce sixteenth notes (far left) at the finger cursor by pressing "1," eighth notes by pressing "2," etc. The icon in the lower right corner is the Plug icon, which you use to change printer code and speaker defaults. Like Bill Budge's Pinball Construction Set, of which it is reminiscent, MCS is easy and fun to use, and it has the potential for being a powerful learning tool. The packaging and promoting of this program give full credit for authorship to Will Harvey, a 16-year-old, about whose tender age much hoopla is made. The Budge touch is unmistakable, though, right down to the same pointing hand that moves the bumpers and flippers of his pinball program into position. Budge and his pioneering Pinball



Construction Set are also under the Electronic Arts umbrella these days, so the close resemblance is not surprising. I don't mean to take credit away from Harvey, who probably deserves most of it, but the similarities are undoubtedly not coincidental. The analogy serves to tell anyone who has experienced Budge's pinball program just

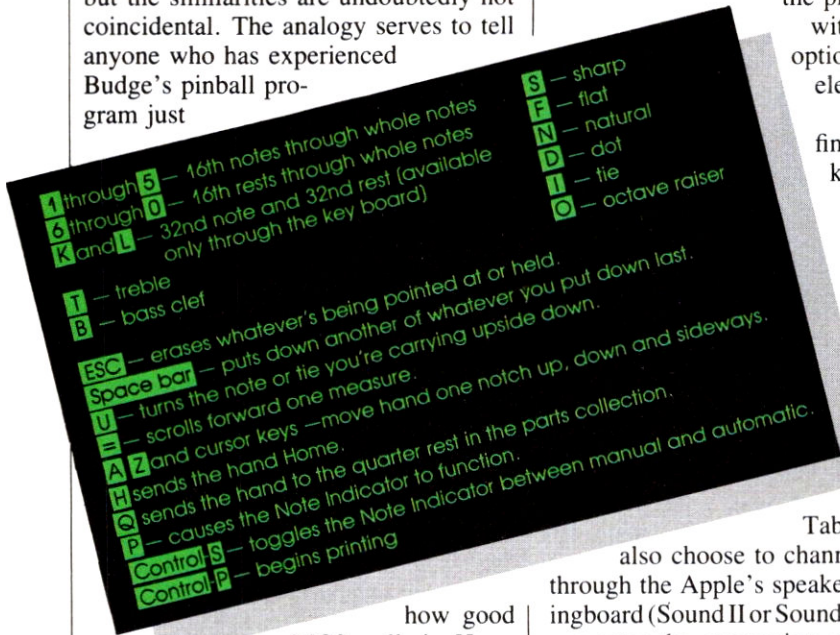
mally does on paper.

If you leave it unattended after booting it, MCS will go into a demonstration mode, performing the ten selections that come on the diskette. Press Return, and the program starts with a series of options. You can elect to control the pointing finger from the keyboard (using the up- and down-arrow keys, if your computer is a IIe), with a joystick, or with the Koala-Pad Touch

options and found them to be equally easy to use, but I soon found myself abandoning them to take advantage of the program's built-in shortcuts, which allow you to place most notes and rests with one or two keystrokes (see figure, this page).

If you don't already have it, Electronic Arts tempts you to buy a Mockingboard by including a certificate that reduces the price by \$25. I strongly recommend that you take advantage of the discount, because although the Music Construction Set functions admirably without the Mockingboard, once you have heard your work—or, for that matter, Mozart's or Gershwin's—in stereo with six voices, the Apple speaker will no longer satisfy you. The Mockingboard Sound II is a good investment with or without MCS, for it comes with software that allows you to produce spectacular stereophonic sound effects. Several games currently on the market are designed to take advantage of the card's sound properties.

Although MCS is designed to work with either version, I refer here to the Mockingboard Sound II, not the Mockingboard Sound/Speech, which includes speech abilities but is monaural (the Sound II version has room for two SSI-



how good MCS really is. Here, instead of positioning flippers and bumpers, one places musical notations on a staff, essentially performing on a hi-res screen what a composer nor-

also choose to channel the sound through the Apple's speaker or a Mockingboard (Sound II or Sound/Speech) and can enter the appropriate code for your dot-matrix printer.

Yes, Music Construction Set can give you a hard copy of your music, albeit a slightly rough one. I tried all three cursor

apple modem. with everything.

\$129

Just plug the NETWORKER into a single slot on your Apple II, II+, IIe or Franklin computer, and 300 baud of data communications power is yours. It's that simple! Now "boot" the accompanying software and see the features that no other modem offers:

- Easy to follow on-screen menus, status indicators, and prompts
- Continuous memory usage update

- Text trapping of entire display into RAM memory
- Disk storage capability for all trapped text

No other hardware or software needed, yet this modem can be used with most all Apple compatible software. For the experienced user—ask about the NETMASTER software package which offers greater versatility in communications and many other additional features.

AVAILABLE AT:

NETWORKER \$129.95
NETWORKER/NETMASTER COMBO \$179.95
NETMASTER \$ 79.95

The **BACH** Company

zoom

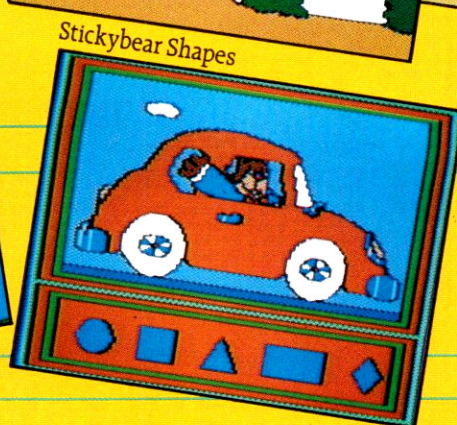
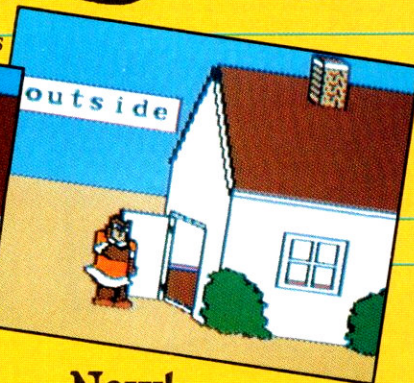
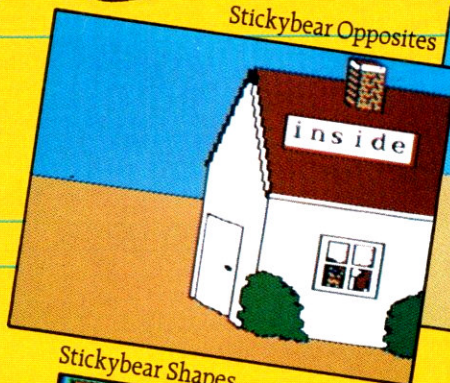
760 San Antonio Road, Palo Alto, CA 94303
Call TOLL FREE (800) 227-8292, in CA call (800) 248-BACH (2224) except 415 area code use 424-0800

CIRCLE 269 ON READER SERVICE CARD

The Bear Essentials.



★ Stickybear ABC Award Winner



New!

Stickybear Shapes
Three games – Name a Shape, Pick a Shape, Find a Shape. Correct answers make animated pictures come alive.

Stickybear Opposites
Big, colorful animated pictures – Stickybears, unicycles, balloons, more – teach opposites. Up/down, full/empty, in front/behind, more.

Stickybear ABC Award-Winner
Full-screen, full-color animated pictures represent each letter in the alphabet.

Stickybear Numbers
Colorful moving objects – trucks, ducks, planes, more – teach numbers and counting. Over 250 picture combinations.

Runs on Apple II or Apple II+ with 48K and one disk drive, 3.3 DOS, and Apple IIe or Apple III.

Stickybear is a registered trademark of Optimum Resource, Inc. Apple and Apple II, II+, IIe and III are registered trademarks of Apple Computer, Inc.

Give preschoolers a head start in basic skills with these total learning programs!

Here's a fresh, exciting way to treat 3- to 6-year-olds to a wonderland of learning...and help them discover important concepts – Shapes, Opposites, Numbers and ABC's – they'll need to succeed in school.

These 4 delightful programs for the Apple® Personal Computer are chock-full of Stickybears,™ plus dozens of charming critters, ice-cream colors, music...plus the most advanced animation ever for the Apple – all created by world-famous children's illustrator, Richard Hefter.

Each program includes a full-color poster, stickers, Parent's Guide, plus 32-page hardcover book – to help bridge that critical gap between books and computer!

Look for Stickybear software in finer computer stores everywhere. Or, call toll-free 800-852-5000, Dept. AE-7. Only \$39.95 each.

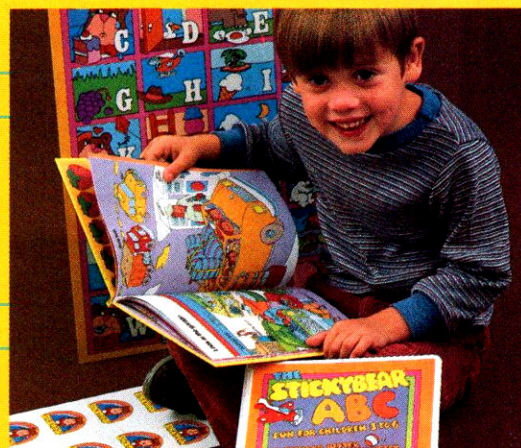
WeeklyReader Family Software

A division of Xerox Education Publications
Middletown, CT 06457

Created by Richard Hefter, Janie and Steve Worthington and Spencer Howe for Optimum Resource, Inc.

A/M44AE7

CIRCLE 350 ON READER SERVICE CARD

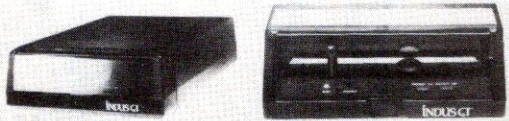


1-800-547-7861

IN CALIFORNIA CALL
1-800-824-6732
or (213) 828-7565

INDUS SYSTEMS DISK DRIVES

GT Disk Drive without controller..... **329.00**
GT Disk Drive w/controller..... **399.00**



Compatible with Apple II, II+, IIe, and GT System Software: word processing, data base management, and spreadsheet financial analysis. Full 35 track, 143K Byte capacity. Includes PortaCase, carrying case for disk drive that converts to an 80 diskette library. Compatible with DOS 3.3, CP/M, and Pascal operating systems & all half track protected software. WarrantyPlus provides a full one year parts and labor warranty.

COMPUTER SOFTWARE

RECREATIONAL:

Stone of Sisyphus..... 23.96
Choplfiter..... 27.96
Wizardy..... 35.96
Blade of Blackpoole..... 31.96
Lode Runner..... 27.96
David's Midnight Magic..... 27.96
Deadline..... 33.90
Zork I, II, III..... 26.90
Zaxxon..... 27.90
Castle of Wolfenstein..... 19.90

BUSINESS:

Bank Street Writer..... 46.90
PFS: Report..... 84.90
PFS: File..... 84.90
PFS: Graph..... 84.90
Versaform..... 311.00
Quickcode..... 236.00
D Util..... 76.20
Multiplan..... 181.90
Personal Investor..... 95.90
Wordstar..... 329.00
Home Account..... 54.00
Visicalc..... 176.00
Supercalc..... 156.00
Creative Financing..... 156.00
Word Handler..... 159.20

EDUCATIONAL:

Master Type..... 27.00
Face Maker..... 26.00
Type Attack..... 27.00
Kindercomp..... 21.00
...The Most Amazing..... 27.00
Story Machine..... 23.00
Compu-Read..... 21.00
Wordrace..... 27.00
Fraction Fever..... 27.00
States & Capitols..... 15.00

TRANSTAR PRINTERS

120P..... **499.00**
120S..... **609.00**
T315 Color Printer..... **495.00**
w/Pics Apple..... **588.00**



T315 Parallel interface, four hammer printing head, 30 color Shades, prints at 50 characters per second.
120P 14 characters per second, Diablo code compatible, auto load, 80 columns, uses Transtar 130 ribbons/print wheels.

*"Plug Into
The Future"*

WITH
**DIGITAL
RESEARCH**

CP/M
Card..... **369.00**

(Plug In Z-80 card Includes: 6 megahertz Z-80 B Microprocessor, 64K Ram memory, real time clock CP/M Plus, CBasic, & GSX 80 graphics extension)

COMPUTER HARDWARE

MONITORS:

AMDEK
Color I..... 295.00
Color I+..... 310.00
Color II..... 445.00
Color III..... 380.00
300A..... 158.00
300G..... 149.00

USI

13" Color Composite..... 295.00
9" Green PI-1..... 119.00
12" Green PI-2..... 145.00
12" Amber PI-3..... 155.00
9" Amber PI-4..... 145.00

GRAPHIC INTERFACE CARDS:

Grappler +..... 135.00
Bufferboard..... 139.00
Buffered Grappler +..... 189.00
Pkaso..... 135.00

PRINTERS:

C-ITOH
Prowriter 10"..... 385.00
Prowriter 15"..... 670.00
Starwriter F-10-40cps 1250.00
Starwriter F-10-55cps 1570.00
OKIDATA

82A..... 408.00
83A..... 658.00
84P..... 995.00
92P..... 517.00
93P..... 862.00

TRANSTAR

130P..... 715.00
130S..... 745.00

Pics Apple

109.00

BROTHERS

HR-1 Parallel 15cps..... 999.00

HR-1 Serial 15cps..... 1100.00

Tractor Feed..... 170.00

DAISY WRITER

Daisy Writer Printer..... 1049.00

Tractor Feed..... 149.00

ADVANCED LOGIC SYSTEMS

Smarterm II..... 142.00

Z80 CP/M 2.2..... 140.00

Z80 CP/M

64K, 6mhz, 80 col..... 308.00

MICROSOFT:

Softcard..... 239.00

Premium System..... 469.00

(Includes: softcard, VidexVideterm, 80 col., CP/M users guide)

Softcard Plus..... 439.00

Premium Softcard IIe..... 359.00

MODEMS:

NOVATION

Apple Cat II..... 309.00

Apple Cat..... 609.00

Upgrade Kit..... 339.00

DC HAYES:

Micromodem IIE..... 279.65

s/Smartcom 1 pKg

Smartmodem 300..... 225.00

Smartmodem 1200..... 509.00

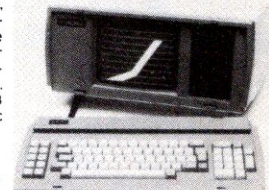
TELEVIDEO COMPUTER SYSTEMS

Teleportable I (1 Drive), Teleportable I (2 Drives)

We carry a complete line of TeleVideo Computer Systems. For prices & more information, call.

Z80A CPU, 64K RAM expandable to 128K, CPM 2.2 operating system, GSX-80 graphics driver, Two 5 1/4" slim line disk drives with one megabyte unformatted and 737.2 Kilobyte formatted storage, Parallel printer port, RS232C modem port, RJ11C SuperMouse port, Optional RS-422 board for network port, 9" Ergonomic yellow phosphor nonglare screen, PC style low profile keyboard (83 keys, 10 function keys, numeric keypad with editing keys)

complete with TeleWrite (executive word processor)
TeleCalc (electronic spreadsheet)
TeleChart (business graphics)



ORDERING INFORMATION

When ordering by mail please include: YOUR TELEPHONE NUMBER, NAME, and ADDRESS. For credit cards add: credit card account number and EXPIRATION date. For personal checks include DRIVERS LICENSE NUMBER and BIRTH DATE. Prices are subject to change (beyond our control), so please call, to verify them.



HOURS: Monday-Saturday
8:00 a.m. to 5:00 p.m. PST

SOUTHERN CAL MICRO

*The Vital Link Between
You & Your Computer*

CIRCLE 198 ON READER SERVICE CARD

3113 PICO BOULEVARD, SANTA MONICA, CALIFORNIA 90405

263 speech-synthesis chips, which will soon be available).

You can plug the board's two RCA connectors into an amplifier's auxiliary input, but you don't have to, because its two half-watt amplifier chips will give you ample volume when you connect them directly to a couple of 8-ohm speakers. I have mine hooked up to a pair of Realistic Minimus-7s (from Radio Shack), and the sound exceeds most people's expectations. Besides vastly improving the audio output of the MCS, the Mockingboard frees the Apple from its sound-generating chores, handing the reins over to the graphics functions. Thus, the program can scroll the music from right to left on the screen as it plays. It can also activate the beat counter, which serves to signal—by turning to inverse video—when a measure's number of beats is not in line with the selected time signature. You will, of course, hear any such discrepancy, but the beat counter makes it easier to pinpoint the source. You sacrifice these important features when you use the Apple's speaker.

Blues Gone Awry

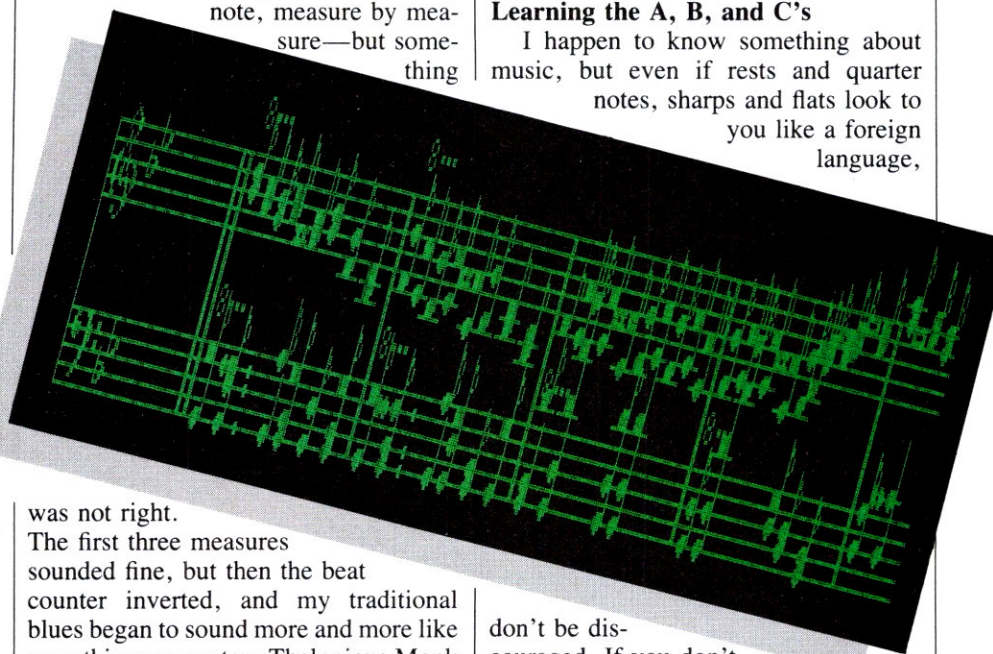
To test the various features of MCS, I "constructed" "Backwater Blues," a

1927 composition by blues singer Bessie Smith. Using a transcript of the original recording, from a songbook I authored a few years back, I entered pianist James P. Johnson's accompaniment note by note, measure by measure—but something

sure that each measure contained exactly four. Once I corrected this difficulty, MCS performed the old blues respectably, with the treble and bass staves playing in perfect synchronization.

Learning the A, B, and C's

I happen to know something about music, but even if rests and quarter notes, sharps and flats look to you like a foreign language,



was not right.

The first three measures sounded fine, but then the beat counter inverted, and my traditional blues began to sound more and more like something an amateur Thelonious Monk enthusiast might have hammered out. I solved the problem easily by counting the beats and, since "Backwater Blues" should be played in 4/4 time, making

don't be discouraged. If you don't know an F-sharp from a B-flat, pressing P or Control-S activates the "note indicator," showing exactly which note or position the little hand is pointing to; if



Announcing
a price breakthrough on
backing-up
64k and 128k
PROTECTED SOFTWARE

Introducing

COPY MASTER II

a disk copy system for the Apple II, Apple II+ & Apple IIe
that makes a back-up copy with the push of a button.

SO WHY PAY MORE?

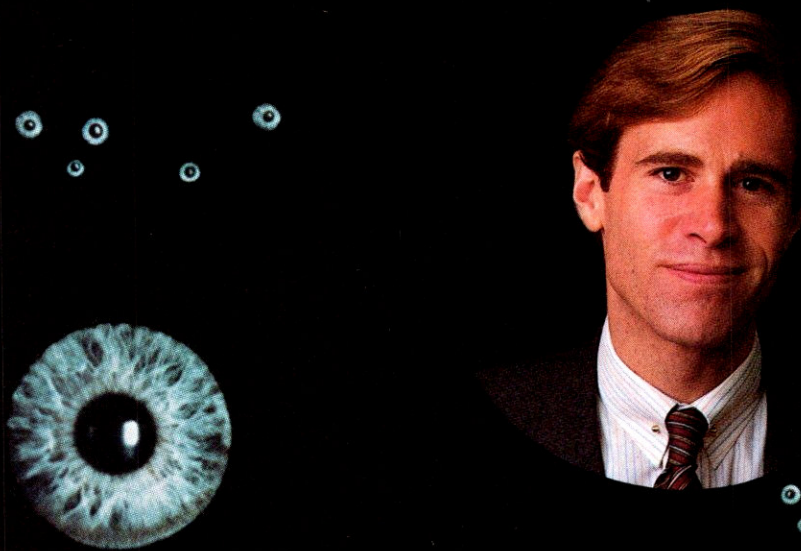
TAKE ADVANTAGE OF OUR LOW INTRODUCTORY PRICE AND ORDER NOW:
Send check or money order for \$99.95 plus \$5 shipping and handling (Calif. residents please add 6% (L.A. County 6½%) Calif. Sales Tax) to:

APPLIED TECHNOLOGY LABORATORIES
11926 Santa Monica Boulevard, Dept. N
Los Angeles, California 90025
(213) 477-6815

(Please specify computer type when ordering)

- ★ COPY MASTER II makes back-up copies of all memory resident software, at the press of a button. (64k copy requires a language card or a IIe).
 - ★ Bit copiers and nibble copiers, such as Locksmith, Nibbles Away and others, are hard to use because a different set of complex parameters must be discovered for each program that the user wants to back-up. COPY MASTER II requires just the press of a button to copy all of memory onto a standard DOS 3.3 initialized disk. The copy produced is unprotected and can be loaded back into memory with standard DOS commands.
 - ★ Previously hidden code becomes accessible and subject to change or study.
 - ★ Freeze games and then restart them days later. Or save the winning display on disk.
 - ★ Single-step and trace through any program.
 - ★ The COPY MASTER II set comes complete with plug-in, slot-independent board, operating software on disk and an instruction manual. Since COPY MASTER II has on-board RAM rather than unchangeable ROM it supports both the COPY as well as the STEP and TRACE programs. Unlike some copy boards, there is no extra utility software or expensive EPROM to buy. There are no chips to pull.
 - ★ All hardware is made with the finest components. There are no shortcuts taken: 18 chip board.
 - ★ System Requirements: an Apple II, Apple II Plus, or an Apple IIe, 1 disk drive and DOS 3.3.
 - ★ 48k copy made in less than 15 seconds, 64k in less than 20 seconds, 128k in less than 30 seconds.
 - ★ Special utility program allows the copies to run without a copy board.
- TRADEMARKS: Apple II, Apple II Plus and Apple IIe are trademarks of Apple Computer, Inc.
Locksmith and Nibbles Away are trademarks of Omega Micro-ware, Inc. and Computer: applications respectively.
- Important Notice: COPY MASTER II has many uses. However, THE COPYING ABILITIES OF COPY MASTER II SHOULD BE USED SOLELY FOR ARCHIVAL PURPOSES. Any other copying use may be illegal.

“Thoughtware, How Good A Manager Am I?”



Thoughtware is new, easy-to-use software that will help you see and understand how to become a better manager. It's a unique series of personal, computer-based management diagnostic and training programs.

® Thoughtware is a registered trademark of the Institute for Management Improvement.

How good a manager are you? Thoughtware Module 1.1 “Assessing Personal Management Skills” will tell you. This program is a three-part, comprehensive self-assessment of your personal attitudes, behavior and understanding as they relate to your effectiveness as a manager.

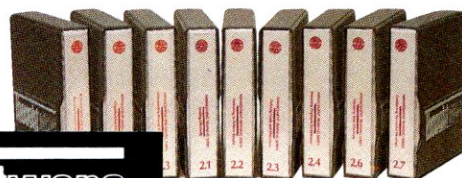
Unit 1 assesses your leadership style by examining the degree to which you are task- or people-oriented and how you use communication, teamwork, participation, initiative and support to get results. It also assesses your understanding of what motivates employees, promotes teamwork, and the extent to which you provide feedback.

Unit 2 assesses your attitudes about setting goals and objectives, clarifying roles and responsibilities, and delegating. It also assesses the methods you use to improve employee performance and the ways you conduct performance evaluations.

Unit 3 assesses your personal effectiveness by looking at how you manage time and stress, how you conduct meetings and solve problems. The programs conclude with specific recommendations designed to address the weaknesses identified.

To introduce you to Thoughtware, we'll send you “Assessing Personal Management Skills” (which normally sells for \$350), for only \$150. (See adjacent column for details.)

Thoughtware programs run on the following: IBM® PC, PC XT, PCjr and compatible PC's, Apple® II Plus and IIe.



Thoughtware®

Expanding The Universe Of Learning.

Thoughtware Is The Future.

It's a new way to learn, a logical and innovative approach to management training. It will revolutionize management training now, and in the future. Thoughtware utilizes the latest research in management development from leaders in the field, and has been tested nationally.

For the individual, and his organization, the educational, economic and operational benefits of Thoughtware's computer-based learning programs are enormous. But Thoughtware isn't just the future.

Thoughtware Is The Present.

Some of the largest and most prestigious corporations and organizations in the world have purchased Thoughtware's Assessing Personal Management Skills Program.

American Express	Ingersoll-Rand
American Mgt. Assoc.	IRS
Apple Computer	Johns Hopkins Univ.
AT&T	Levi Strauss
Avon	Marriott
Bankers Life	Marsh & McLennan
Blue Cross & Blue Shield	Mass. Mutual
Bank of Boston	McGraw-Hill
Bureau of the Census	MCI
Chevron USA	U.S. Navy
Ciba-Geigy	NCR
Citibank	NYU
City of Dallas	Owens-Illinois
Crown Zellerbach	Owens-Corning
Dow Jones	Fiberglas
Dun & Bradstreet	Royal Cup Coffee
Du Pont	Sentry Insurance
Ernst & Whinney	Singapore Embassy
Exxon	Stone & Webster
Federal Reserve Bank	St. Regis Paper
Fireman's Fund	Tampax
General Electric	The Nestle Co.
General Foods	The Rouse Co.
Georgia-Pacific	3M Corporation
Gov't of Canada	TRW
Gulf Oil Corporation	Univ. of Illinois
Hewlett Packard	United Parcel Service
Horn & Hardart	United Way
Hughes Aircraft Co.	Univ. of Mass.
Husky Oil	Westmoreland Coal
IBM	Westinghouse Corp.
	Xerox

And hundreds more. What they've learned, you can now discover.

You can reap the benefits of Thoughtware by visiting your local computer dealer, or call us at our toll-free number 1-800-THT-WARE, or write:

Thoughtware Inc.

Dept. E, 2699 So. Bayshore Dr.
Coconut Grove, Florida 33133.

Other Thoughtware Programs include:

2.1 *Leading Effectively*


2.3 *Defining Goals And Objectives*

2.4 *Improving Employee Performance*

2.5 *Managing Time Effectively*

you have a Mockingboard, you'll also hear the note.

Obviously, MCS could become a key to a better understanding of music, its rules, and its notation. Fully aware of this, author Harvey, with Douglas Fulton, who adapted and arranged the music on the diskette, has included several musical examples—in addition to the aforementioned ten—designed specifically as tutorials. If you *are* treading on unfamiliar territory and wish to take advantage of MCS's potential as a learning tool, I recommend a perfect companion program: Apple Music Theory, a series of drills designed to teach the fundamentals of music. It was developed by Linda Borry of MECC (Minnesota Educational Computer Consortium) in conjunction with Apple Computer, which markets it. After you have worked with MCS for a while—entered music, played it, revised it, and carefully listened to the changes—you can test your-

 **No matter how intimate your knowledge of music is, you shouldn't expect to write a symphony with it.**

self with the Apple Music Theory program, and all the pieces will soon fall into place. Next thing you know, you will be moving the little hi-res hand in sequences you've never explored. In other words, you will be composing.

Yes, you can compose a ditty or two using the Music Construction Set, but no matter how intimate your knowledge of music is, you shouldn't expect to write a symphony with it. While it is an amazing program, capable of generating impressive sounds from an Apple, it will not turn your computer into a professional musical instrument. The limitations are surprisingly few, however. It is, for example, impossible to enter a triplet, so you have to improvise, so to speak, and use dotted notes to approximate the desired effect. Only advanced music makers will notice the other little restrictions. One drawback that's easy to recognize is the size of the work space, which leaves very little room in each measure. There are no provisions for widening the space between the vertical lines that separate measures, so things can easily get a bit cramped, but that is

largely a cosmetic problem.

Vertical space is another matter: by placing the octave raiser above the top staff, one can eliminate the overlap between the bass and treble clefs, and thus work within a full five-octave range. Placing the octave raiser to the left of the double bar raises everything on the top staff a full octave, but measures can also be raised individually. The figure on page 73, an Epson MX-80 printout of the first four measures of Mendelssohn's Scherzo, from *A Midsummer Night's Dream*, shows how I overstepped normal range limits by putting an octave raiser (the "8 . . ." symbols above each measure) above the top staff and lowering the notes one octave below what I originally wrote. Had an octave raiser symbol been placed above the staff to the left of the double line, the entire song would have been raised.

A close look at the working screen suggests other limitations, such as the absence of 32nd notes and rests, but don't worry—they are only a keystroke away. There simply wasn't room for them on the graphics page. Press the K and L keys, respectively, and these symbols will pop onto the screen at the tip of your cursor's finger.

Clipped Notes

Another excellent feature of MCS is that it lets you cut and paste measures, both within a song and from one song to another. Like everything else in this program, the performance of these two functions is easy. To cut the music, simply "pick up" the scissors; to paste it, pick up the glue pot. You can cut several measures at once by entering the number of measures after you have placed the scissors over the first measure. The scissors work on only one staff at a time, but that is an advantage, for it lets you try a melody against a variety of bass lines or rhythms. If you attempt to cut more notes than the buffer will hold, a warning beep sounds, but you won't lose any data. The glue pot inserts the contents of the buffer, pushing existing measures to the right, much as a word processor does.

Of the five gauges at the left of the "icons," only one works if you choose the Apple-speaker option. It controls the speed of the playback, and if you place it incorrectly, it can dramatically affect the outcome. You need the Mockingboard to take advantage of the sound and volume controls, which come in pairs; each affects a different staff and speaker. Every time you move the volume controls, a note sounds to indicate the loud-

Hitch your Apple to a Star.



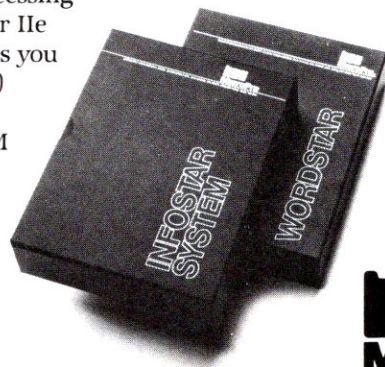
Apple, CP/M & IBM PC are registered trademarks of Apple Computer Inc., Digital Research Inc. & IBM Corp. respectively.

Now when you buy our best selling WordStar word processing software or InfoStar data base manager for your Apple II, II+ or IIe computer, we'll throw in a free CP/M board. (The one that gives you full implementation of WordStar in one board instead of three.)

With it, you'll be able to take full advantage of the advanced features that already made WordStar No. 1 on the IBM PC. And you can use InfoStar data base manager to enter, sort, and report information without programming in code.

To take us up on our offer, hurry down to your local computer store and pick up WordStar or InfoStar.

Either one will make your Apple shine.



Technical Data: Board Includes 6 MHz Z-80B Processor, 64K RAM, CP/M 2.2, 70 Column High Resolution Capability, Shift Key Modification Device, And Expansion Interface Connector.

MicroPro.

CIRCLE 114 ON READER SERVICE CARD

ness level—a nice touch—and the ability to turn either staff all the way down is helpful when you search for sour notes. The sound controls have four positions: regular, smooth (continuous), vibrato, and drum. You will probably wish to keep these controls in the first two settings, but you can obtain some interesting percussion effects with the last setting. The diskette has several examples in a file named Rhythm. Chalk up another mark for the Mockingboard.

The working screen also indicates the current key, which you can transpose, provided it is within the proper range. If the key you request is too high or low, you hear a beep, and the program reverts to the original setting. Transposition is a simple matter of pointing the finger and pressing Return to start the key options scrolling, then repeating the procedure when the desired key appears. Only major keys are shown, but a key-signature chart in the manual shows how to make the conversion to minor.

Loading and saving music is also easy. Placing the hand on the disk icon and pressing Return opens the program to such DOS commands as LOAD, SAVE, and CATALOG. SAVE BLUES.D2 writes a file named BLUES to an initialized disk in the second drive, for example.

To Print or Not to Print

If you have a dot-matrix printer, chances are good that you can also get hard copy of your music. According to Electronic Arts, the program is set to work with an Apple dot-matrix printer, C-Itoh ProWriter, NEC 8023, "or a look-alike for any of these three." If your printer is none of the above, the reference card offers some tips for entering a printer code and gives one example, for an Epson with Grafrax Plus. Even after a thorough study of the MCS and Okidata manuals, I could not get my Okidata 92 to produce a comprehensible printout, so I tried the Epson MX-80, entering the code listed for that printer on the MCS reference card. It worked, but only after a call to Electronic Arts. The code, as printed, is very unclear—letters in black are control characters, it says, but there *aren't* any letters in black. For anyone who has encountered the same problem, here is the correct Epson code sequence: ESC, A, Control-G, ?????, ESC, K, Control-@, Control-A, ?????, E. ESC represents the Escape key, commas should be ignored, and there is no space between entries. The reference card lists this sequence as the code for an Epson with Grafrax Plus; it also works with the earlier version of Grafrax.

Electronic Arts' representative admitted that these instructions left much to be desired. In a way, so does the printout, which is vertical and makes an already compressed chart even more so. Still, it is readable, and it adds greatly to the program.

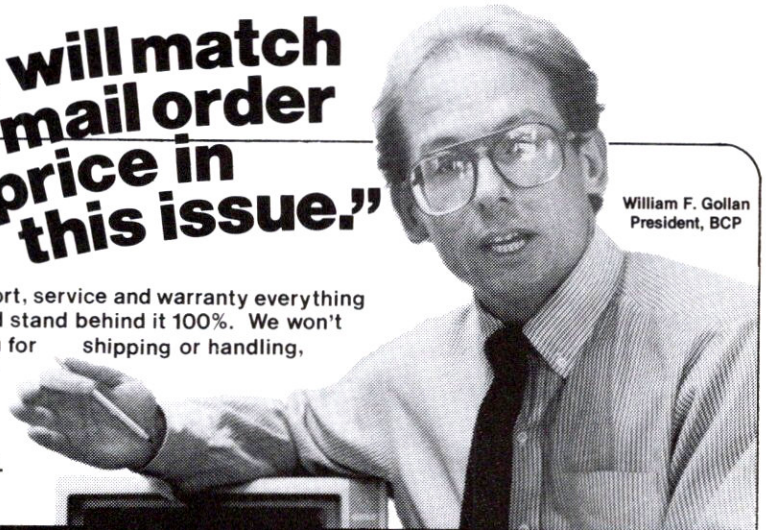
All in all, Music Construction Set is a well-conceived, easy-to-use music processor. Working with it extensively, I found only one instance in which the wrong keystroke yielded an unwanted character rather than a beep, but pressing Return restored things to normal. The

packaging is in the now-familiar Electronic Arts style, resembling a small record album. It contains the disk; an informative, attractively illustrated 13-page users' manual; and a six-page reference card.

I am impressed with the Music Construction Set, even with the two-voice sound of the Apple speaker (a three-voice upgrade is on the horizon), but my enthusiasm is in large measure due to the performance of the Mockingboard Sound II card. This is truly a winning combination. **+**

"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.



William F. Gollan
President, BCP

COMPUTERS				PRINTERS DOT MATRIX			
Franklin Ace 1000	\$ 789.95	Franklin Ace 1200 OMS	\$1469.95	C. ITOH 8510	\$ 379.95	Gemini Radix 15	\$ 699.95
MONITORS				C. ITOH 1550	609.95	Okidata 82A	369.95
Amdek 300 A	\$159.95	Amdek Color III +	\$369.95	Epson RX 80	319.95	Okidata 83A	559.95
Amdek Color I +	299.95	USI Pi 3 12" A	159.95	Epson RX 80 F/T	399.95	Okidata 84	959.95
Amdek Color II +	439.95	USI Pi 4 9" A	145.95	Epson RX 100	559.95	Okidata 92	439.95
MODEMS				Epson FX 80	539.95	Okidata 93	699.95
DC Hayes Smartmodem 300	\$219.95	Novation Apple Cat II	\$279.95	Epson FX 100	689.95	Tally MT 160L	619.95
Smartmodem 1200	499.95	Prometheus Pro 1200	389.95	Gemini 10x	289.95	Tally MT 180L	809.95
Micromodem IIe w/s	249.95	Anchor Mk. 7	1200 309.95	Gemini 15x	409.95	Tally Spirit	319.95
PERIPHERAL CARDS				Gemini Delta 10	459.95	Toshiba P1350	1599.95
ALS Z80 CPM 2.2	\$124.95	Neptune 64k +80	199.95	Gemini Delta 15	559.95	Toshiba P1340	799.95
Z80 CPM 3.0 B1	289.95	Neptune 128k +80	299.95	Gemini Radix 10	599.95	Transtar 315 Color	469.95
East Side Wildcard II	109.95	Neptune 192k +80	379.95	LETTER QUALITY PRINTERS			
Koala Graphic Pad	84.95	Synetix Flashcard 144kb	309.95	C. ITOH F10 40	\$1099.95	NEC 2030	\$809.95
Microsoft Z80 CPM Softcard	229.95	Flashcard 288kb	449.95	C. ITOH F10 55	1399.95	Silver Reed 500	419.95
Premium Pack II +	459.95	Sprite I	119.95	Dynax DX 15	449.95	Silver Reed 550	569.95
Premium Pack IIe	339.95	Sprite II	199.95	Daisywriter 2000 48k	999.95	Star PowerType	379.95
Titan 32k Ram	174.95	Supersprite	309.95	FLOPPY DRIVES			
64k Ram	264.95	Videx		Rana Elite 1 163kb	\$279.95	Micro Sci A2 143kb	\$249.95
128k Ram	354.95	Videoterm w/ss	229.95	Rana Elite 2 326kb	429.95	Micro Sci A40 164kb	289.95
GRAPHIC INTERFACES & BUFFERS				Rana Elite 3 652kb	539.95	Micro Sci A70 286kb	349.95
Grappler + w/16k	\$135.95	Ultraterm	279.95	SOFTWARE AND ACCESSORIES			
w/32k	194.95	Enhancer II	109.95	Bank Street Writer	\$ 49.95	PFS Report	\$ 79.95
w/64k	229.95	Quadram 8k Fazer	\$139.95	Dollars & Sense	79.95	PFS Graph	79.95
PKASO II	135.95	Quadram 16k Fazer	159.95	Graphics Magician	41.95	Sensible Speller IV	79.95
Print-It	169.95	Quadram 32k Fazer	179.95	Home Word	39.95	Screenwriter II	84.95
HARD DISKS				Home Accountant	49.95	Typing Tutor	19.95
Corvus 6mB	\$1599.95	Quadram 64k Fazer	194.95	Multipian DOS	179.95	Versaform	249.95
Corvus 11mB	2199.95	Quadram 128k Fazer	274.95	PFS Write	79.95	Visicalc E	169.95
Franklin 10mB	1599.95	Fingerprint	119.95	PFS File	79.95	Zork 1 2 or 3	29.95

BC BUSINESS COMPUTERS OF PETERBOROUGH FREE SHIPPING 12 School Street • Peterborough, NH 03458 **ORDERS ONLY: 800-845-3003** **QUESTIONS: 603-924-9406**



The Macintosh has a new ring.

The ARTSCI **MAGICphone™** creates an entirely new aspect to the APPLE Macintosh™, that provides a spectrum of voice/telephone communications.

Software is provided to manage and dial hundreds of phone numbers and will record and print the details (time, number, and charge) of each call. The phone log can be printed on a daily, weekly, or monthly basis. The mouse is used to select and dial any phone number, and **MAGICphone** uses TONE dialing to any of the lower-cost telephone carriers like SPRINT and MCI.

The **MAGICphone** also allows control of two separate phone lines. A "hold" feature for each line with lighted indicators is provided. You can then call someone to the phone or pick up an extension and continue the call. The **MAGICphone** can temporarily stop incoming calls, and the caller will hear a busy signal.

The **MAGICphone** can be used as a stand alone telephone without Macintosh control. Tone dialing and last number redial are standard features.

Installation is a snap. You simply plug the **MAGICphone** into your Macintosh speaker jack, and into your phone line.

Available now. \$199.95.



ARTSCI, INC.
5547 Satsuma Avenue
North Hollywood, CA 91601
818/985-2922

MAGICphone was developed for ARTSCI by Digital Matrix Inc.
MAGICphone is a trademark of Artsci, Inc.
Macintosh is a trademark of APPLE Computer, Inc.

CIRCLE 109 ON READER SERVICE CARD

A+ ▶ NEW SECTION

Macintosh



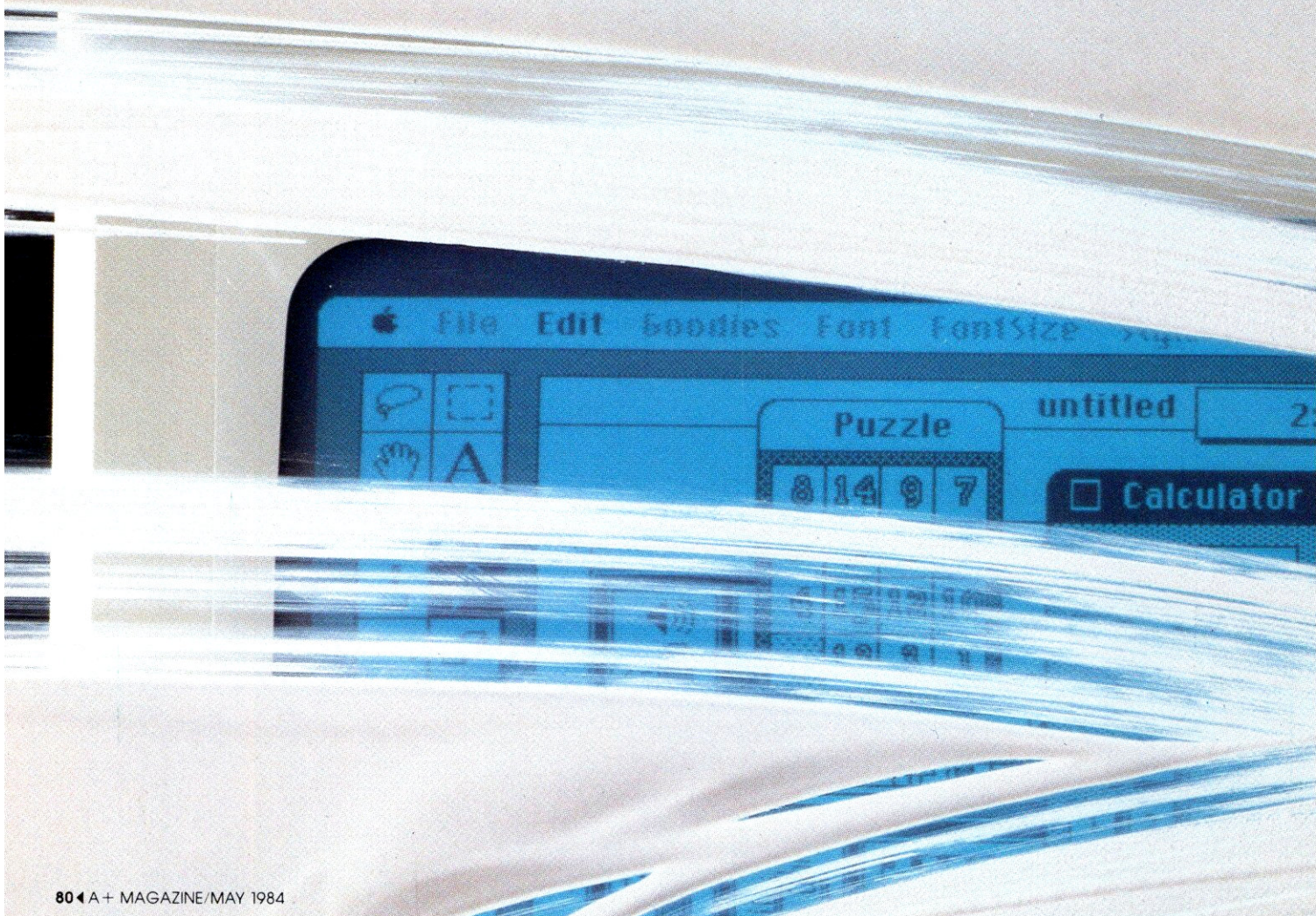
W

elcome to *A +*'s new section on the Macintosh and the Lisa, your source for information about Apple's newest personal computers. For new or potential owners or even just the curious, this new monthly section in *A +* will provide the most current and useful information possible to help you use the Macintosh and the Lisa to their fullest extent.

If you have ever tried a Macintosh, you're probably hooked; if you haven't had an opportunity to test its innovative

features, take the time—it is well worth it. Like the Lisa, the Macintosh is completely different from other computers. From its small size to its mouse to its icons and windows, the Macintosh is a thoroughly intriguing product. We have three Macintoshes in the *A +* office, and I am delighted to report that everyone from secretaries to editors is clamoring to get time on one of them. We literally have to lock the "little guys" away every night to be sure no one tries to "liberate" them.

We aren't the only people who are excited about the Macintosh. In an informal survey of some of our readers,



we discovered that many of you are planning to buy a Macintosh. In order to fill your information needs on the new 32-bit product line, we are inaugurating this special section dedicated to presenting useful and interesting articles. Each month you will find tutorials and features on how to use these products effectively and software and hardware evaluations to help you make buying decisions.

To help you keep up to date on the flood of new products coming out for the Macintosh and the Lisa, we are establishing a regular feature called Pipeline, which will be a chart of new products, listing the product, company name and address, availability, and price information when possible. We have

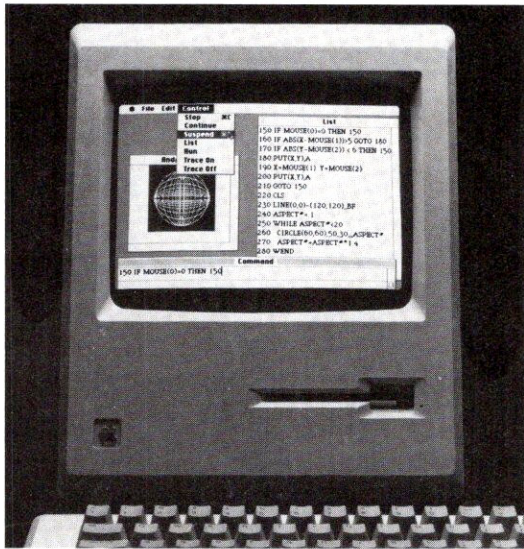
signed up Thom Hogan, author of the best-selling book *The CP/M User Guide*, to write a regular column on using the Macintosh.

Our aim is to make this section essential reading; we want to be on your desk rather than on your coffee table. Our goal is to provide you with current information on how to use your computer for professional and personal purposes. We encourage you to participate in the magazine, so please write us with suggestions and comments. We would also like to hear how you are using your Macintosh or Lisa and would appreciate any tips you have for other readers.

As with any new project, many people have made a special effort to ensure its success. I would particularly like to thank Barbara Koalkin and Lisa Van Horn of Apple Computer for responding so quickly to our equipment needs. +

Maggie Cannon

Apple's® new baby has



Microsoft BASIC
on Apple's new Macintosh

It's called Macintosh.™ And it has our brains and a lot of our personality.

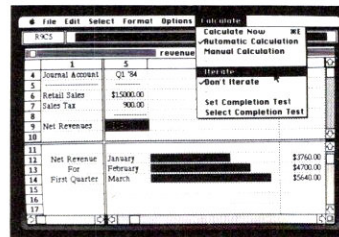
We're called Microsoft.® And our part of Macintosh is five new programs that are bright, intuitive, outgoing, understanding and born to perform.

Our pride, your joy.

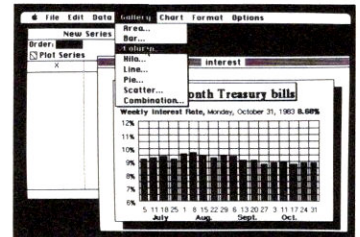
Taking advantage of Macintosh's mouse and rich graphics, we've designed software that works like you, even thinks like you.

All our programs share the same plain English

commands. So what once took days to learn, now takes hours or minutes to learn with Macintosh.



Microsoft Multiplan



Microsoft Chart

Meet the family.

Our financial whiz is MULTIPLAN®, an electronic spreadsheet that actually remembers how you work. Even offers suggestions on spreadsheet set-up.

When it comes to writing, nothing travels faster

CIRCLE 320 ON READER SERVICE CARD

our best features.

than our WORD. Using the mouse, it lets you select commands faster than you can say "cheese."

Our most artistic child is CHART. It gives you 40 presentation-quality chart and graphic styles to choose from.

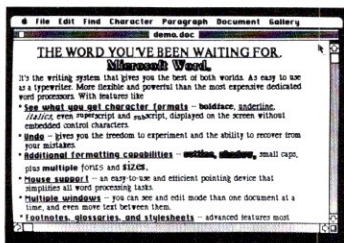
FILE is our most manageable child, an advanced personal record management program. **MICROSOFT**
The High Performance Software

And BASIC, the language spoken by nine out of ten microcomputers worldwide, is the granddaddy of them all. Now enhanced to take advantage of the

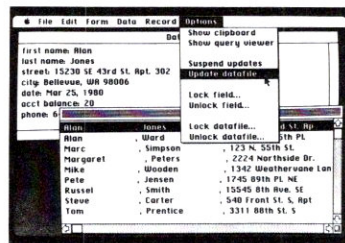
Macintosh mouse, windows and graphics.

We'll be adding more to the family soon. So call 800-426-9400 (in

Washington State call 206-828-8088) for the name of your nearest Microsoft dealer.

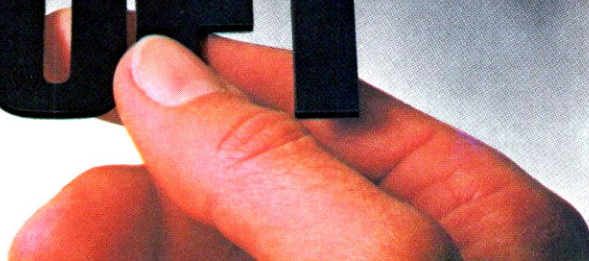


Microsoft Word



Microsoft File

MICROSOFT



THE MAC AT WORK/BY FREDERIC E. DAVIS

*An introduction to
Apple's word-processing program
for the Macintosh*

MacWrite: The Executive Memo Writer

MacWrite is Apple Computer's word-processing program for the Macintosh. The program, which is flexible, powerful, and relatively easy to use, provides the Macintosh with some features previously available only on expensive dedicated word processors and business computers such as the Xerox Star



and Lisa 1, which were priced in the \$10,000-30,000 range.

The most impressive features of MacWrite have to do with the way the computer displays text on the screen. The first things that you notice about MacWrite are the display, which is exceptionally crisp and clear, and the characters, which are black on a white background. This display looks like a familiar piece of paper and is easy on your eyes. Furthermore, the system gives you true proportional spacing and a variety of typefaces, which allows you to prepare documents with a professional typeset look.

The wide selection of on-screen type styles and sizes is a major inno-

vation for a low-cost word-processing program and is not available on any other personal computer. This feature is like having an inexhaustible supply of press type for creating typeset-looking materials such as letterheads, business forms, résumés, advertising copy, handbills, flyers, bulletin-board announcements, and company reports. Although the print quality is not as sharp as with real typesetting, the look is quite good and will suffice for many business-graphics tasks.

MacWrite does have its limitations, however. According to Randy

Wigginton of Encore Systems, one of the program's authors, "MacWrite was designed for writing term papers, memos, business reports, and the like. It really wasn't meant for writing books." Randy also said that Encore is working with Apple on continuous updates for MacWrite that may even



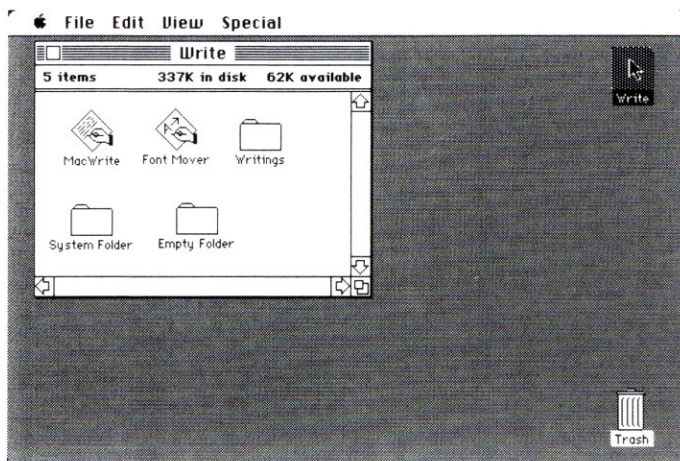


Figure 1: "Double-clicking" the mouse on the diskette icon opens the MacWrite diskette.

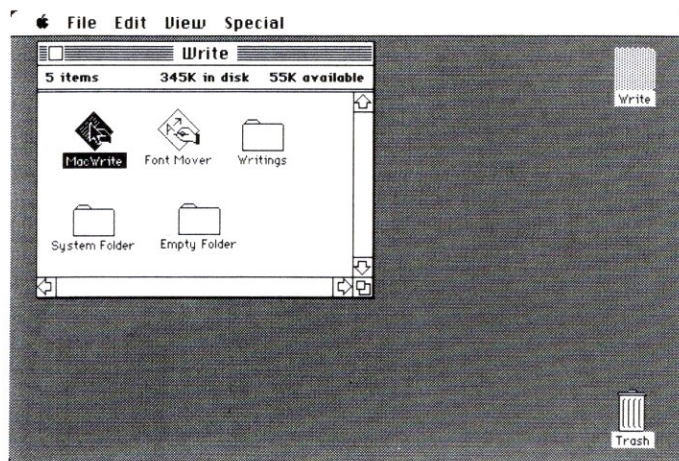


Figure 2: Double-clicking on the MacWrite icon starts the program.

include a page-layout system by the end of the year. The company seems committed to upgrading the MacWrite software and providing continuing support for the program.

Despite MacWrite's limitations, which we'll elaborate on later in this article, the program represents a major breakthrough in low-cost text editing and word processing. Not only is the program well suited for home and school use, but it also has a lot to offer businesspeople. In fact, MacWrite may be the ideal executive memo writer.

Using MacWrite

To use MacWrite effectively, you should first become familiar with the mouse cursor controller. You use it to choose commands, select sections of text, and move the cursor. Although MacWrite has alternative keyboard commands, being accustomed to operating the mouse is important if you are to get the most out of MacWrite. Some people have trouble using the mouse at first, but with a bit of practice, it becomes almost second nature.

Touch-typists and people who are used to other computer word-processing systems may find it distracting to take their hand away from the keyboard to manipulate the mouse. Once you get the hang of using it, though, you'll probably find the mouse more a help than a hindrance. Also, you use the mouse only while editing; you still do the initial typing on the keyboard. MacWrite, with its mouse, allows you to move a block of text, search and replace, scroll through a document, and perform other functions with fewer separate actions than what traditional word-processing programs such as WordStar require.

Not only should you be familiar with the mouse before using MacWrite, but you should also become familiar with the Macintosh's features and functions, such as how to control windows and how to work with files and diskettes. The Macintosh is so different from other computers that even though it is easier to learn about, you should still do the learning first. As you learn about the Macintosh, you will encounter its hidden features, such as the clipboard and desktop accessories.

The Macintosh clipboard is an imaginary clipboard where a single item that you "cut" or "copy" remains until you either "paste" it somewhere or put another item in its place. The clipboard is a temporary storage place and can hold either text or graphics.



You can reach the desktop accessories only by using the mouse to point at the small black apple in the upper right-hand corner of the screen. The desktop accessories that you may find helpful while using MacWrite are the scrapbook, notepad, calculator, clock, key caps, control panel, and puzzle. You can use all of these accessories within MacWrite. Here's a brief rundown on what these accessories are for:

Scrapbook—a permanent place to store items that you cut or copy. The scrapbook can hold up to 256 items, either text or graphics, if you have enough space on your diskette. If you try to save something created with MacWrite that contains both text and

graphics in the scrapbook, only the text will be saved. The system saves text in the scrapbook in 12-point New York type. If you want to use the scrapbook to store an image with mixed type styles and sizes, or with mixed text and graphics, you must use MacPaint to create the item.

Notepad—allows you to store up to eight small pages of notes permanently.

Calculator—provides an on-screen image of a calculator for quick arithmetic calculations. You can activate the keys on the calculator by "pushing" them with the mouse or by typing the corresponding keys on the keyboard or the optional numeric keypad.

Clock—displays the time and date and sounds an alarm at any time you specify. It helps keep you from getting too caught up in your work and missing appointments and other important events.

Key caps—shows you how to generate many different special symbols at the keyboard.

Control panel—allows you to adjust computer settings for features such as keyboard touch, the rate at which keys repeat, speaker volume, distance that the mouse needs to be moved and so on. It lets you adjust the Macintosh to suit your preferences.

Puzzle—a small puzzle that is just for fun. It also helps you practice pointing with the mouse.

Now that we've introduced you to some of the Macintosh's features, let's take a look at the MacWrite program. In order to give you an idea of how MacWrite works, we'll run through a play-by-play of how to start up the program.

1. Put the MacWrite diskette in the

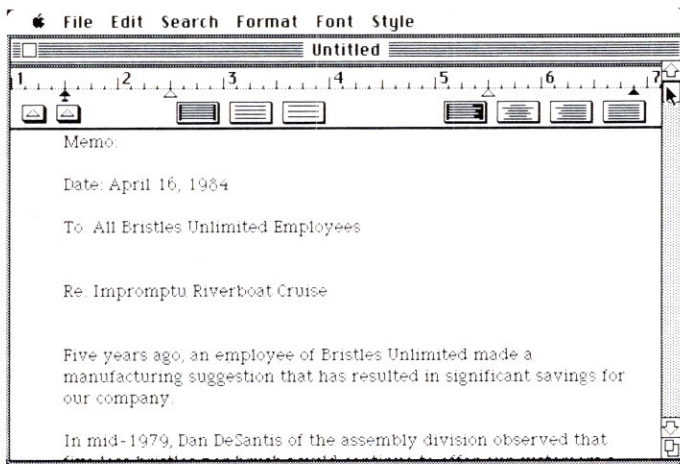


Figure 3: Using the elevator box to scroll to the beginning of the document

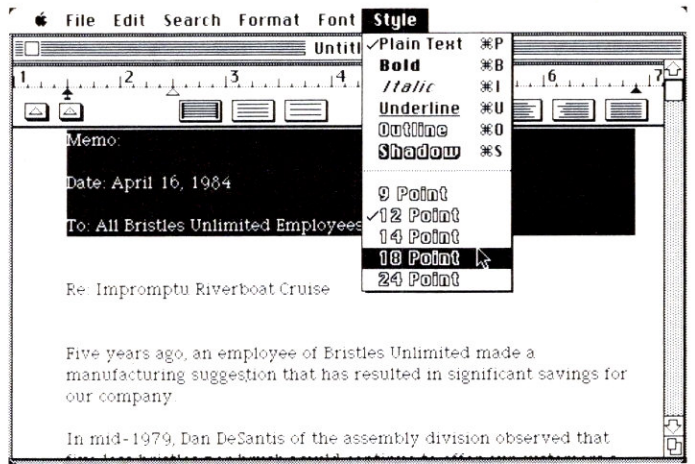


Figure 4: Changing the type size of the memo's first three lines

built-in disk drive and turn the computer on. The screen should first give you the Macintosh welcome message, and then it will display the clear desktop with icons for the diskette and the trash can. The diskette remembers what files were open, if any, when you used it last. If you left any files open, they will appear on the desktop as well.

2. With a clear desktop and a closed diskette icon, select the diskette and open it up to display its contents by pointing at it with the mouse and clicking the button twice in rapid succession ("double-clicking")—see figure 1. If the screen already shows the contents of the diskette, you can skip this step.

3. To create a new document, point at the MacWrite icon and double-click the mouse (see figure 2). You will get an untitled empty document, and you're now ready to start typing.

MacWrite, among other things, specializes in type-style options. You can select from a wide variety of fonts and type styles to create a message that actually looks like the message you're trying to get across.

In order to give you some ideas on how to use these MacWrite fonts and styles, here's an office-memo project to give you an example of what's possible. What you create is limited only by your imagination.

4. To create an office memo, type the following passage, disregarding word breaks:

Memo:
Date: April 16, 1984
To: All Bristles Unlimited Employees

Re: Impromptu Riverboat Cruise

Five years ago, an employee of Bristles Unlimited made a manufacturing suggestion that has resulted in significant savings for our company.

In mid-1979, Dan DeSantis of the assembly division observed that five fewer bristles per brush would continue to offer our customers a superior painting tool, while saving us a bundle of money. Thanks to Dan's insight, Bristles Unlimited has saved \$546,000.

In honor of Dan's outstanding contribution to Bristles Unlimited, the management invites all employees to celebrate on a midweek riverboat cruise down the Mississippi next Wednesday, April 18th.

5. Now move to the beginning of the document by dragging the elevator box to the top of the elevator bar (see figure 3). Next, highlight the first three lines by pointing at the beginning of the first line, pressing the button on the mouse, and holding it down while dragging the mouse to the end of the third line; then release the button. Now point at the word Style on the menu bar and select 18 Point from the Pull-down menu (see figure 4).

6. Highlight the line **Re: Impromptu Riverboat Cruise** by pointing at the beginning, holding the button down, dragging the mouse to the end of the line, and releasing the button. This time select 24 Point from the Style menu (see figure 5).

7. Now highlight the remainder of the memo by pointing at the beginning of the passage and holding down the mouse button while dragging the mouse to the end of the line. Next select 18 point from the Style menu and go right back to the Style menu and select Bold.

8. Finally, go to the File menu and select Print. When the Print menu appears, press the OK button by pointing at it and clicking with the mouse (see figure 6). The printed memo should now look like the reduced version depicted in figure 7.



Again, you can select from a wide variety of type fonts on the Font menu and combine the fonts with some of the other type styles from the Style menu.

Limitations of MacWrite

Macwrite does have its limitations. The program is not really a full-featured word processor suitable for writing a book or a doctoral dissertation, for example. MacWrite is best suited to writing relatively short memos and reports.

One of the most restricting limitations of the program is that it can hold a maximum of only 8½ single-spaced pages of text (assuming one-inch margins at the top and bottom). MacWrite can hold only this much at one time because the entire document is stored in the computer's active memory (RAM) and is saved to the diskette only when you are done working. Although keeping the entire document in active memory limits the size of the document, it does en-

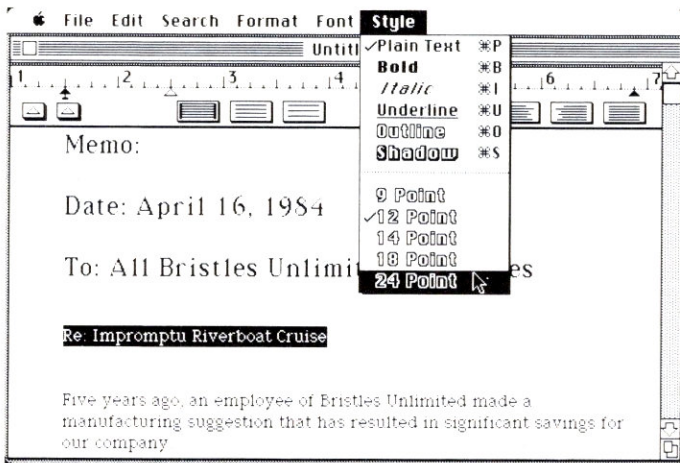


Figure 5: Changing the type size of the memo's fourth line

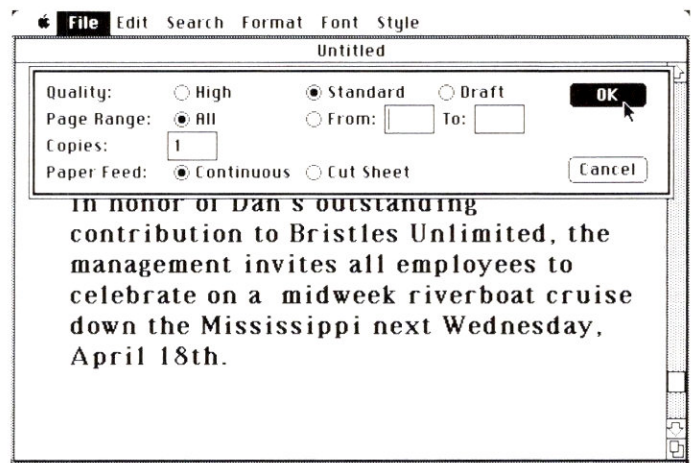


Figure 6: Pressing the OK button to print the memo

able you to reformat entire documents with lightning-fast speed. Also, MacWrite does have a provision for linking documents when you print, so you can create longer documents with consecutive page numbers.

Another limitation is that you cannot view an entire page at once. You must scroll up and down within your document, and there are restrictions on the left and right margins. The minimum left margin is at 1 inch and the maximum right margin is at 7³/₈ inches.

Other drawbacks are that the program does not support hyphenation,

Memo:

Date: April 16, 1984

To: All Bristles Unlimited Employees

Re: Impromptu Riverboat Cruise

Five years ago, an employee of Bristles Unlimited made a manufacturing suggestion that has resulted in significant savings for our company.

In mid-1979, Dan DeSantis of the assembly division observed that five less bristles per brush would continue to offer our customers a superior painting tool while saving us a bundle of money. Thanks to Dan's insight, Bristles Unlimited has saved \$546,000.

In honor of Dan's outstanding contribution to Bristles Unlimited, the management invites all employees to celebrate on a midweek riverboat cruise down the Mississippi next Wednesday, April 18th.

Figure 7: Reduced version of the printed memo

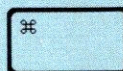
and it has no built-in spelling dictionary. If you are looking for a word-processing system for the Macintosh that offers more features, you should consider other programs such as Mi-

crosoft's Word. If most of your writing is memos, reports, and documents under 40 pages long, however, then MacWrite is an excellent writing tool. +

Shortcuts

If you're the kind of writer who hates to lift your fingers from the keyboard to initiate commands with the mouse, there's good news. You can issue several of the most common editing commands directly from the keyboard.

You activate these keyboard commands by pressing the command key in combination with other keys. Here is a drawing of the Command key that I created using MacPaint, copied to the clipboard, saved in the scrapbook, and then pasted into the MacWrite document.



Command-X

Cut (removes highlighted area and saves it on the clipboard)

Command-C

Copy (saves copy of highlighted area on the clipboard)

Command-V

Paste (transfers what's on the clipboard to the screen)

Command-Z

Undo Last Action (lets you undo whatever you just did—this command can be a real lifesaver)

Command-

Stops current process (such as printing)

Since you may wish to change type styles while you are typing, the program offers several command-key shortcuts for type-style changes.

Command-P Plain text
Command-B Boldface
Command-I Italics
Command-U Underline
Command-O Outline
Command-S Shadow

Some other shortcut techniques require three or more keys to be pressed simultaneously:

Command-Shift-1

Ejects the diskette located in the internal drive

Command-Shift-2

Ejects the diskette located in the external drive (if you have an optional drive)

Command-Shift-3

Takes a "snapshot" of the screen and saves it as a MacPaint document

Command-Shift-4

Prints the contents of the active window only

Command-Shift-4-Caps Lock

Prints the contents of the entire screen

A shortcut for transferring groups of documents is to place them all in a folder and then transfer the folder. This method really speeds up file transfers with a single-drive system and can significantly cut down the number of diskette swaps necessary.

New products for the Macintosh are proliferating at an increasing rate.

The Magicphone

Hardly a day goes by that we don't hear of another hardware or software item for the Mac. One especially innovative product is the MAGICphone from Artsci of North Hollywood, California. The MAGICphone is a hardware/software product that combines a telephone handset with a Macintosh program for using the phone.

The hardware part of MAGICphone is a rectangular box with a removable telephone handset that mounts on the side of the Macintosh or on a nearby wall. The unit connects to the Macintosh via the Mac's audio-output connector. The Mac's internal sound synthesizer creates the tones a touch-tone phone uses for dialing telephone numbers or the codes companies such as MCI and Sprint use.

You can use the MAGICphone as an ordinary telephone when the computer is turned off, or you can control

it through software when the computer is on.

The MAGICphone software consists of four main parts. (1) The "dialer" icon looks like the keypad on a touch-tone phone, to dial a number, you point to the number and click the mouse. (2) The dialing and phone-directory program has a mini database for storing and retrieving phone numbers. The directory allows you to sort

the list, select a number to be called, and redial the number if the line is busy or not answered. (3) The software includes an appointment calendar, and (4) a clock/calendar lets you time and keep track of your calls.

The MAGICphone can access two different telephone lines and provides a "hold" feature for making full use of a second line.

Products such as the MAGICphone are a good example of how warmly the Macintosh is being received by software and hardware developers. You can look forward to seeing many other new Macintosh products featured in *A+* in the coming months. **+**

PRODUCT INFORMATION

MAGICphone

Artsci

5547 Satsuma Avenue
North Hollywood, CA 91601
(213) 985-2922

List Price: \$199.95

Required: Macintosh



The Scrapbook and Clip Art

*Collecting
predrawn images
is easy with the
Macintosh scrapbook.*



One subject that isn't covered well in the Apple manuals is the scrapbook. Ideally, the scrapbook should serve as a graphic "boilerplate" facility. You store often-used phrases and images in the scrapbook and retrieve them at will to paste into your text or drawing.

The scrapbook is quite different from the clipboard facility on the Macintosh desktop. The clipboard can contain only one object of each data type (initially one graphic image and/or one text sample) at a time. The clipboard comes in most handy when you have to move information between MacPaint and MacWrite. For instance, in last month's installment, I suggested that you create a logo using MacPaint, copy it to the clipboard (by using the Cut option on the Edit pull-down menu), leave MacPaint, start MacWrite, and then move the logo from the clipboard to the text page by using the Paste option on the Edit pull-down menu.

That's all fine, but what if you want to use the logo for lots of documents? Having to get the logo onto the clipboard from MacPaint each time you want to use it (or refrain from using the clipboard for anything else) can become downright annoying.

Fortunately, the scrapbook comes to the rescue. To move something from MacPaint or MacWrite to the scrapbook, you first put the item in question into the Paste buffer (clipboard). Next, select the Scrapbook function from the Apple pull-down menu. With the scrapbook displayed on the screen, pull down the Edit menu and select the Paste function.

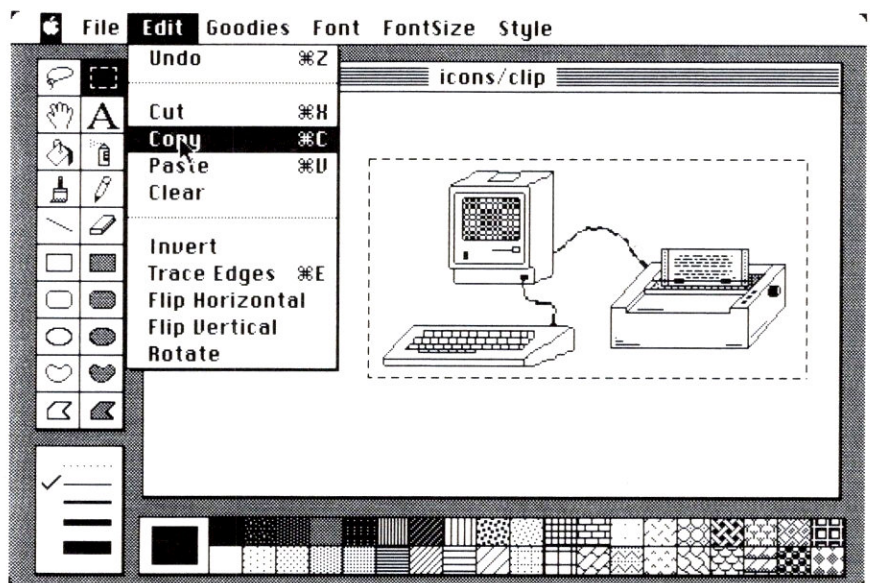


Figure 1: Moving images to the scrapbook, step 1: Select image from buffer and move it to clipboard.

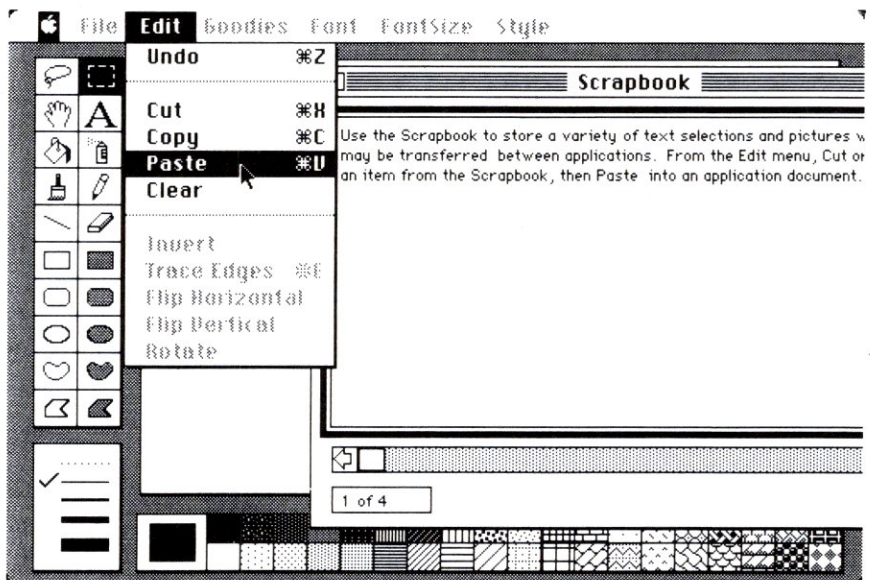


Figure 2: Moving images to the scrapbook, step 2: Paste from clipboard to scrapbook.

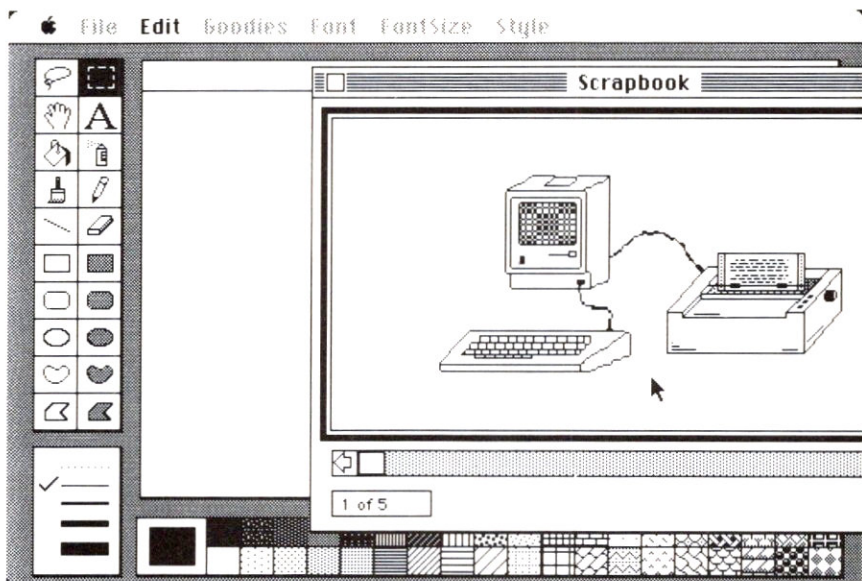


Figure 3: Item is copied to scrapbook.

The item in the Paste buffer will be copied to the scrapbook (see figures 1-3 for an example).

To move something from the scrapbook to the page you're creating (editing), move the scrapbook display on the screen to the selection you desire (use the scroll bar at the bottom to move from item to item), pull down the Edit menu, and select the Copy function. The clipboard now contains the scrapbook image. (Figure 4 shows this process.)

T

o remove something from the scrapbook, have the scrapbook and the appropriate selection displayed on the screen, pull down the Edit menu, and select the Cut function (see figure 5).

Unfortunately, the scrapbook items are stored as graphic images in a disk file, which means that you have a theoretical and a practical limit on the number of items you can store in your scrapbook. The theoretical limit is the disk capacity that remains after you take the program and system files into account. The practical limit is something far short of this, since you need space for the document you're working on and the desktop icons. I've found that five to ten items in my scrapbook are usually about the right number. (I keep different scrapbooks for each diskette—my MacPaint diskette contains predrawn objects, and my MacWrite diskette contains some boilerplate text.)

Apple provides some items in the

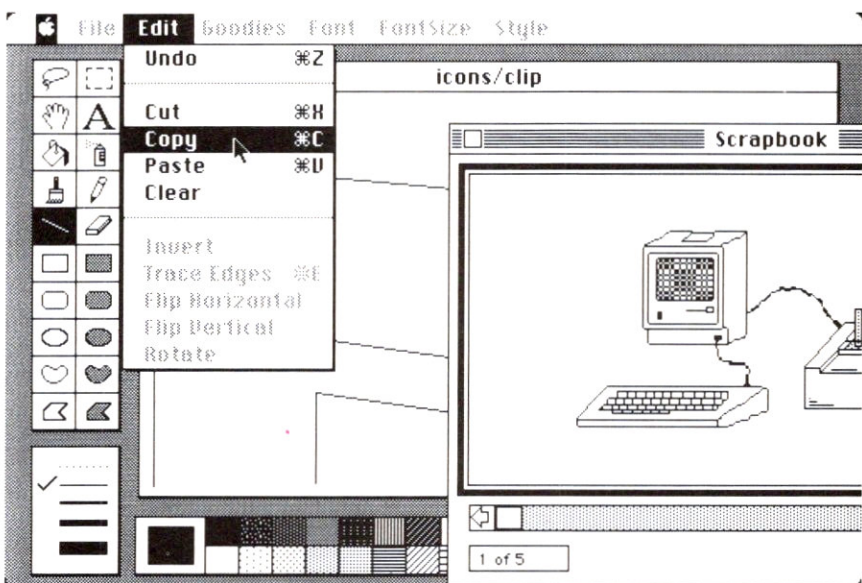


Figure 4: Copying image from scrapbook to clipboard

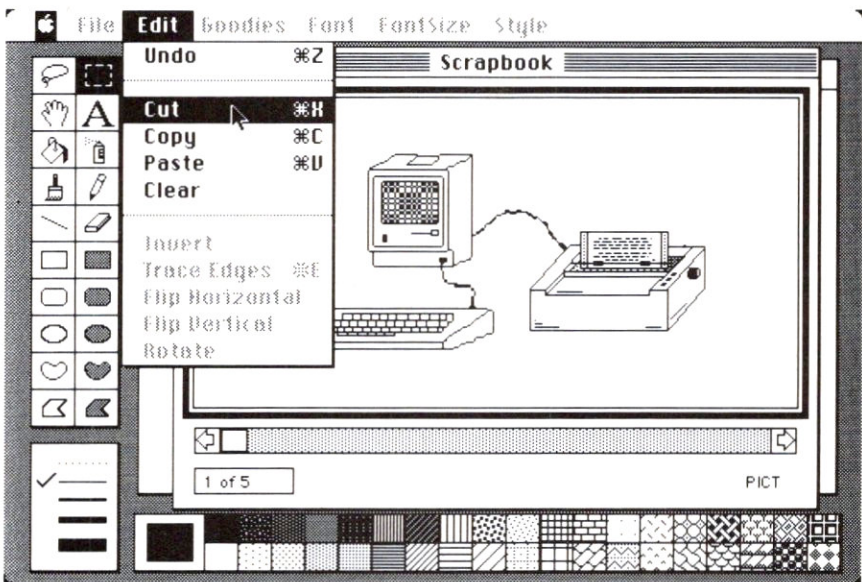


Figure 5: Removing image from scrapbook

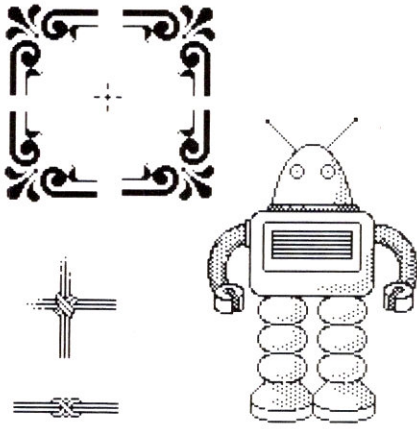


Figure 6: Items in Apple's standard scrapbook

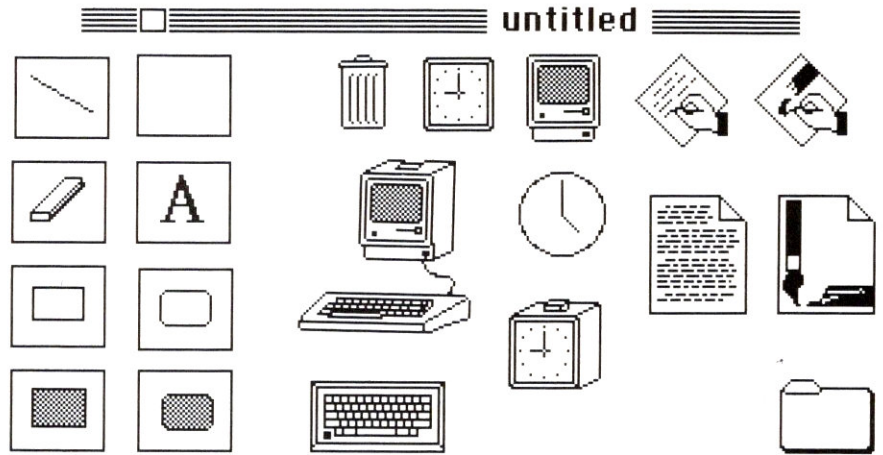


Figure 7: Author's scrapbook file containing Macintosh icons

scrapbook that comes with the MacWrite and MacPaint disk. I found a text note on the disk describing the scrapbook, a robot, and some border details (see figure 6).

Some of the things you might want to keep in your scrapbook are

- company logo
- your name and address
- standard letter closing
- symbols you use repeatedly in your work
- clip art

What's this last category, clip art? Clip art is standard designs and graphics that are used often. Newspaper advertisements are often created solely from clip art and typeset copy. Standard newspaper clip art includes everything from 100 different graphic "sale" announcements, to automobile silhouettes, to corporate trademarks. That basket of eggs the local supermarket advertises, for instance. Do you think an artist draws that each and every week the store has a sale on eggs? Of course not—the eggs are drawn once, and copies are reproduced whenever the store needs another picture of eggs.

The term *clip art* comes from the notion that many of the predrawn illustrations are reproduced many times on a single page, and newspaper layout artists simply clip out one of the copies each time they need that drawing.

The Macintosh is perfect for clip art. In fact, one of the first things I did when I got my Macintosh was to begin compiling a set of clip-art graphics I could use to illustrate books and articles I wrote about the Macintosh.

An obvious candidate for clip art was for me the Macintosh icons: the disk icon, the program icon, even the

Macintosh's own icon (see figure 7). I started collecting icons by first saving a screen that contained them (by pressing the Shift, 3, and the Command keys simultaneously). I then used MacPaint to extract the icons I wanted from the saved screen and moved them to my clip-art file.



What types of images are suitable for clip art? I can come up with an almost inexhaustible list:

- icons
- signs
- trademarks
- logos
- borders
- body parts
- maps
- tools
- music symbols
- architectural symbols
- alternate alphabets
- decks of cards, dice
- flags
- often-used drawings

Once I'd started putting together a clip-art file, I couldn't stop. Indeed, I still haven't stopped, and I've almost filled a disk with clip-art material (see figure 8 for some examples).

As you assemble your clip-art collection, don't forget that MacPaint has some handy rotation and flipping facilities. Rather than creating all four corners of a fancy border, just make one and use MacPaint's flip functions to make the other three. That's why only one corner appears in the Apple scrapbook. Move this corner to your illustration, select it, and make three other copies of it (by holding down the Option key while moving the mouse). Next, select each corner and flip it to the right orientation. Last, use the lasso to move the corners into the proper position.

Apple has indicated that it might provide a disk full of clip art in the future, but I'll get the ball rolling right away. I've collected a disk full of copyright-free clip art, which I'll make available at a low fee (about \$20, my cost of copying, shipping, etc.) to *A+* readers. If you're interested, drop me a line, care of *A+*, and I'll send you the information on how to obtain your copy.

The more ambitious among you

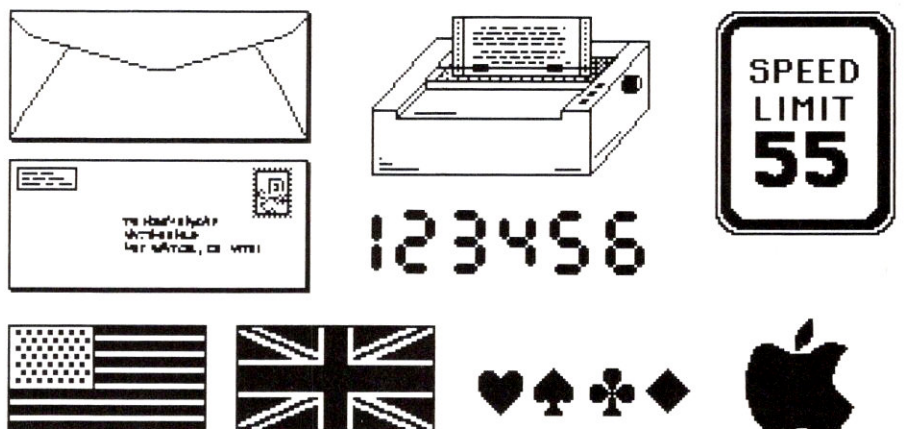


Figure 8: Examples of clip-art material

could consider a clip-art project. Spend 20 minutes a day during the next month drawing commonly found symbols and graphics with your Macintosh. If you're at a loss about where to start, you might want to check out some graphics-reproduction books. Dover Publications puts out a series of "Ready-to-Use" clip-art books:

- *Ready-to-Use Arrows*
- *Ready-to-Use Headlines*
- *Ready-to-Use Borders*
- *Ready-to-Use Floral Designs*
- *Ready-to-Use Christmas Designs*
- *Ready-to-Use Banners*
- *Ready-to-Use Illustrations of Hands*
- *Ready-to-Use Illustrations of Men's Heads*
- *Ready-to-Use Illustrations of Children*
- *Ready-to-Use Sports Illustrations*

Although many of the drawings in these books are dated, they are a good source for getting clip-art ideas. At \$2.95 a book, they are a bargain source of creative ideas, even though I drew only a few of their illustrations for my clip-art files.

The nice thing about having a clip-art disk handy is that you'll produce more creative illustrations in far less time than if you worked completely from scratch. If I were writing about how to program blackjack in Macintosh BASIC, I'd first load my clip-art disk and transfer some card images into my scrapbook before I started writing. I'm sure that you'll be able to find similar uses for clip art.



Since this column appears a couple of months after I write it, a fair amount of Macintosh software should be available by the time you read this. For starters, you should be able to purchase

- Microsoft BASIC
- PFS:File
- Multiplan
- PFS:Report
- Microsoft Chart
- ThinkTank

If these products aren't already available, don't despair; I've seen preliminary copies of them, and they should be available soon.

Next time I'll introduce you to some of these non-Apple software programs and show you how different the same program can be on a Macintosh and, say, an IBM Personal Computer. Until then, remember to work on your clip-art collection! ✚

A Love Letter to My Macintosh

My dearest Mac,

It seems appropriate that I'm writing this love letter on Valentine's day. The last three months have been a great experience for me, especially after the bad times I've had with other computers.

Like every love, you have your share of faults, though. I don't want you to think what I'm going to say diminishes my feelings toward you in any way—I tell you these things so that you can become perfect, unmatched by any other computer.

I have to start my list of your faults with a description of your physical shortcomings. Despite your promises to the contrary, 128K of memory and 400K of disk space are not quite enough for me. Couldn't you go on a memory-development regimen and increase those sizes a bit? Somehow, four disk changes just to move a picture to another diskette take some of the fun out of being with you. I'll meet anything you can do to address this problem with unbridled excitement.

Other minor physical grievances that occur to me are the noisiness of your keyboard (clack, clack, clack is not exactly an endearing sound to us humans), and I really do wish that you had an external video jack so that I could show you off to larger groups of friends. Your connectors stick out a bit too far, which makes you look a tad awkward, but it's nothing to be ashamed of.

The cord to the mouse is probably your most inflexible part; it should yield more readily to my (mouse) advances. After being cooped up in your Mac Pack for a long trip, your mouse cable has a distinct tendency to run in circles.

Your most glaring deficiencies are in your software, though, Mac. Although you excel where others don't even shine, you could still use some polishing.

Take MacWrite, for instance. It's billed as a word processor, but I'd have to rate it several notches lower—more like a quick-and-dirty letter maker. Sure, changing fonts is a new experience, but why don't you have the ability to create form letters easily? Why can't I stick words into the middle of a picture? Why must I use the mouse simply to move the cursor back one word? Why do I have to use

the mouse and pull down a menu to erase a word? Can't you help me with my spellin' and grammar? How about a transpose function?

MacPaint is great. In fact, I find that I can't stop playing with your MacPaint. Yet, even here, there is room for improvement.

Why can't I move portions of a drawing around on the Show Page screen? Why doesn't FatBits scroll automatically when my pen moves to the edge? Can't I have multiple sizes of erasers? And how about a user-selectable grid? For true artists, a bigger drawing area would be helpful, even if it meant shrinking the display or using slightly more convoluted menu-selection arrangements.

While I'm at it, how about real page-pasteup abilities for MacPaint? You'd have to add several features to the program, but not *that* many. A two-page display (side-by-side) would be nice, too, since I often work with a spread.

Other software that works on you has its problems, too. Multiplan from Microsoft, for instance, has the most annoying insert-row-or-column function I can imagine, especially considering how easy it is to remember all your other commands. Why should I have to remember to press the Shift key and the mouse key at the same time? Seems like an unnatural act to me, especially considering how often I use the Insert function.

I know that your Maker is working on fixing some of your more obvious faults (such as coming up with a disk-copy function that takes only four swaps instead of umpteen), but don't let that make you too complacent about other improvements.

Our relationship should last a long time. Already I'm writing a book dedicated to you, and some of my friends and I are putting together a dynamite program for you to use. In short, dearest, I love you like no other computer.

I know I can be demanding sometimes, but we can work our problems out together by just communicating clearly with one another.

Hugs and kisses (and a little tap on your keyboard)



*Teach your Macintosh
to communicate
with the whole world.*

A

n A+ exclusive! The MACTEP terminal-emulation program will let you use your Macintosh and a 300-bps modem to talk to CompuServe; The Source; MCI; another Macintosh; or another computer, such as the IBM Personal Computer.

It takes less than an hour to type in this program, using Microsoft BASIC. Next month, we'll run complete instructions on how to use this version to download an even more advanced copy, complete with error checking, speed control, and full annotation.

Note: To connect a modem to your Macintosh, wire a cable as follows:

Macintosh RS-422 Modem Port		DB-25, RS-232 Modem-Cable Connector
Pin 3	←→	Pin 7
Pin 5	←→	Pin 2
Pin 8	←→	Pin 1
Pin 9	←→	Pin 3

To edit captured files, use BASIC to append them onto an existing MacWrite document.

```

1000 CLS: PRINT "MacTEP - Version 1.40 ";
1010 PRINT "Macintosh Terminal Emulator ";
1015 PRINT "Program"
1017 PRINT "Dennis F. Brothers - 28-Feb-84"
1018 PRINT "CompuServe ID [70065,172]"
1020 PRINT "Copyright (c) 1984 Brothers ";
1025 PRINT "Associates, Wayland MA"
1030 PRINT "Permission is hereby granted ";
1032 PRINT "for personal, non-commercial ";
1040 PRINT "reproduction and use of this ";
1045 PRINT "program, provided this notice"
1047 PRINT "is included in any copy."
1050 PRINT : PRINT "Special bootstrap ";
1060 PRINT "version for A+ Magazine -";
1062 PRINT "300 baud only, no protocols"
1080 '
1100 ' Define constants
1150 DEFINT A-Z: ' Use integers for speed
1170 FALSE=0: TRUE=-1 : BUFLIM =32
1190 LF=10: LF$=CHR$(LF)
1200 CR=13: CR$=CHR$(CR)
1210 XON=17: XON$=CHR$(XON)
1220 XOFF=19: XOFF$=CHR$(XOFF)
1240 CMDB=2: CMDB$=CHR$(CMDB)
1250 CMDE=5: CMDE$=CHR$(CMDE)
1260 CMDR=18: CMDR$=CHR$(CMDR)
1270 CMDT=20: CMDT$=CHR$(CMDT)
1280 '
2000 ' Display instructions
2020 CALL TEXTSIZE(9): CALL TEXTFONT(4)
2060 PRINT " CMD-E exits to the desktop."
2080 PRINT " CMD-R starts and stops ";
2085 PRINT "ASCII receive (download).";
2086 PRINT " CMD-T starts and stops ";
2088 PRINT "ASCII transmit (upload).";
2090 PRINT " CMD-B starts/stops BASIC ";
2095 PRINT "[in ASCII form] receive";
2100 PRINT " (lines not beginning with";
2105 PRINT " a digit are ignored).";
    
```



```

2110 PRINT: PRINT
2120 '
2130 'Open the COM1 port, set the baud rate
2150 OPEN "COM1: " AS #1 'modem port -> #1
2160 GOSUB 9000 'set serial baud rate
2170 PRINT
2180 '
3000 PRINT "- terminal mode - "
3010 '
3060 WHILE LOC(1)
>0 'if rec'd char ready
3070 C=ASC(INPUT$(1,1)) AND &H7F 'get char
3080 IF C
>LF THEN PRINT CHR$(C);
3090 WEND
3100 C$=INKEY$ 'check keyboard
3110 IF C$="" THEN GOTO 3060 'skip if none
3120 IF C$=CMDE$ THEN 3500 'exit
3130 IF C$=CMDB$ THEN BMODE=TRUE: GOTO 5000
3140 IF C$=CMDR$ THEN BMODE=0: GOTO 5000
3150 IF C$=CMDT$ THEN GOTO 6000 'send file
3160 PRINT #1,C$; 'if not command, send it
3170 GOTO 3060 'go back for more
3190 '
3500 PRINT: PRINT "Exiting by user request"
3510 PRINT : SYSTEM
3520 '
5000 PRINT: PRINT "Receive file: ": PRINT
5020 PRINT: LINE INPUT "File Name: ",F$
5025 IF F$="" THEN GOTO 3000 'skip if none
5030 OPEN F$ FOR OUTPUT AS #2 'make file
5040 L$="" 'start with empty line
5050 WHILE F$
>"" 'do until name erased
5060 WHILE LOC(1)
>0 'do if char received
5080 C=ASC(INPUT$(1,1)) AND &H7F
5090 IF C=LF THEN GOTO 5170 'skip lf's
5100 PRINT CHR$(C);
5110 IF C=CR THEN 5130
5120 L$=L$+CHR$(C): GOTO 5170
5130 IF NOT BMODE THEN 5150
5132 'skip if doesn't start with digit
5135 IF L$="" THEN 5170
5135 C$=LEFT$(L$,1)
5140 IF (C$
"0") OR (C$>"9") THEN 5170
5150 'tell sender wait, save line to disk
5155 PRINT #1,XOFF$;: PRINT #2,L$
5160 PRINT #1,XON$;: L$=""
5170 WEND
5180 'stop if CMD-R or CMD-B from keyboard
5190 C$=INKEY$: IF C$="" THEN GOTO 5250
5210 IF C$
>CMDB$ AND C$
>CMDR$ THEN 5250
5220 CLOSE #2
5230 PRINT: PRINT "Receive Ended": PRINT
5240 F$="" : GOTO 5260 'mark all done
5250 PRINT #1,C$; 'if not done, send char
5260 WEND 'done when no file name
5270 GOTO 3000 'back to terminal mode
5280 '
6000 ' Transmit (upload) ASCII file
6010 PRINT: PRINT " - transmit a file - "
6020 LINE INPUT "Transmit File Name: ",F$
6030 IF F$="" THEN GOTO 3000 'skip if none

```

```

6040 OPEN F$ FOR INPUT AS #2 'open file
6050 I=1: LL=0 'Initialize values
6060 XFLAG=FALSE: DLY=FALSE: QUIT=FALSE
6065 'do until last line sent or abort
6070 WHILE NOT ((EOF(2) AND I>LL) OR QUIT)
6080 WHILE LOC(1)
>0 'if char received
6090 IF LOC(1)
= BUFLIM THEN 6100
6095 PRINT #1,XOFF$;: XFLAG=TRUE
6100 C=ASC(INPUT$(1,1)) AND &H7F
6110 IF C=LF THEN GOTO 6150
6120 IF C=XOFF THEN DLY=TRUE: GOTO 6150
6130 IF C=XON THEN DLY=FALSE: GOTO 6150
6140 PRINT CHR$(C); 'if ordinary, print it
6150 WEND 'done with received char
6160 IF NOT XFLAG THEN 6170 'if sent x-off
6165 XFLAG=FALSE: PRINT #1,XON$;
6170 IF DLY THEN GOTO 6250 'if wait, ck kb
6180 IF I
=LL THEN GOTO 6230 'ck line end
6190 PRINT #1,XOFF$; 'line end, stop host
6200 LINE INPUT #2,L$ 'get another line
6210 I=0: LL=LEN(L$) ' set count, length
6220 PRINT #1,XON$; 'start host again
6230 IF I
> LL THEN 6240 'if before end
6235 PRINT #1,CR$;: I=I+1: GOTO 6250
6240 I=I+1: PRINT #1,MID$(L$,I,1);
6250 C$=INKEY$ 'ck keyboard
6260 IF C$="" THEN GOTO 6290
6270 IF C$=CMDT$ THEN QUIT=TRUE: GOTO 6290
6280 PRINT #1,C$; 'if not halt, send it
6290 WEND
6300 CLOSE #2 'close the transmit file
6310 PRINT: PRINT "Transmit Ended": PRINT
6320 GOTO 3000 'go back to terminal mode
6330 '
9000 ' Subroutine to set COM1 baud rate
9040 DIM ML(50) 'array for machine code
9050 I=0
9060 READ A: ML(I)=A 'read data into array
9070 I=I+1 'point to next
9080 IF A
>-1 THEN GOTO 9060 '-1 is end
9110 '
9120 BR=300 'baud fixed at 300
9130 TC=(115200!/BR)-2 'counter value
9140 TCH=INT(TC/256) 'high byte
9150 TCL=TC MOD 256 'low byte
9160 R=12: X=TCL: WSCCB!=VARPTR(ML(0))
9165 CALL WSCCB!(R,X) 'low byte to reg 12
9170 R=13: X=TCH: WSCCB!=VARPTR(ML(0))
9175 CALL WSCCB!(R,X) 'hi byte to reg 13
9180 RETURN
9190 '
9200 'machine language code to set speed
9210 ' saves state, sends baud rate to
9220 ' SCC chip, restores and returns
9250 DATA &H4E56,&H0000,&H1D6E,&H000B
9260 DATA &H000A,&H422E,&H000B,&H1D6E
9270 DATA &H0009,&H0008,&H422E,&H0009
9350 DATA &H007C,&H0700,&H33EE,&H000A
9360 DATA &H00B0,&H0002,&H33EE,&H0008
9370 DATA &H00B0,&H0002,&H027C,&HF8FF
9430 DATA &H4E5E,&H4E75
9470 DATA -1

```




Sending the Macintosh to College

The path to a college education will soon be paved with Apple computers.

That's what Apple Computer hopes, now that it has launched its recently announced Apple University Consortium, amid cheers from educators and jeers from dealers.

Much as it "seeded" software companies with Macintosh technology, Apple has now sown 24 universities and colleges with the rights to purchase Apple products—mostly Lisas and Macintoshes—at greatly reduced rates.

The company anticipates that by the end of 1984, at least 50,000 Macintosh computers will have found homes on college campuses nationwide as a result of the program. Apple says participating schools have committed over \$60 million to the Mac.

Only full-time faculty, students, and staff will be allowed to take advantage of the discount, which runs at approximately 50% off list price at most schools. In return, hopes Apple, the schools will gush forth with a flood of Apple-compatible courseware and applications, perhaps even a blockbuster like VisiCalc.

The Apple University Consortium is the brainchild of Dan'l Lewin, college marketing manager at Apple. Late in 1982, Lewin says, the company realized that many universities were on the verge of making major commitments to microcomputers. Although universities were still purchasing the Apple II in reasonable quantities, Apple noted that no one was considering the product for

large-volume standardization.

"The fundamental reason for doing it was that we looked at history," says Lewin. For instance, in the late 70s, Apple had worked very closely with the Minnesota Educational Computing Consortium. "MECC did an incredible amount of courseware on the Apple II. It has since fostered Apple II's entry into every conceivable school—we even found MECC courseware in a schoolhouse in Nairobi."

Lewin, who singlehandedly put the program together, decided which universities to invite to participate in the consortium, based on which ones had already made "reasonable commitments to Apple products." He chose 24 as the largest number of colleges with which Apple could comfortably sustain a close working relationship.

The members of the consortium include Boston College, Brigham Young University, Brown University, Carnegie-Mellon University, City University of New York, Columbia University, Cornell University, Dartmouth College, Drexel University, Harvard University, Northwestern University, Princeton University, Reed College, Rice University, Stanford University, University of Chicago, University of Michigan, University of Notre Dame, University of Pennsylvania, University of Rochester, University of Texas (Austin), University of Utah, University of Washington, and Yale University.

Lewin aimed for a cross section of

the market, from small private institutions such as Reed to large public institutions such as the University of Michigan.

Because Apple couldn't announce the program while the Macintosh was still under wraps, he says, "we missed a lot of good schools that had plans in place." Lewin says other programs are in the offing, although the consortium won't be expanded.

Under the terms of the agreement with Apple, members of the Apple Consortium order computers directly from Apple. Every faculty member, student, or staff member who buys a Macintosh or other Apple product under the consortium program must sign an agreement averring that the computers are for their own personal use.

Administrative methods vary from school to school. For instance, Stanford requires all buyers who order a personal computer to pony up the entire amount to reserve their machine. At Rice University, however, a payment plan lets prospective purchasers put 20% down until the order is filled. Some schools will provide computers to their faculty, students, and staff for a flat rate; others will levy a small handling fee on top of the base price.

Participating universities welcomed Apple's proposal. This was their chance at up-to-date equipment

*At the 24 universities
in the Apple
University
Consortium, students,
faculty, and staff will
be able to buy
Macintoshes at a
greatly reduced rate.*

for use in all departments. "A lot of people initially said, 'Oh, this will be great for the humanities and social sciences,' but people realized that in all areas they could make use of it, reconceptualizing courses in the technical areas as well," says Priscilla Huston, director of Rice University's Institute for Computer Services and Applications.

Says Michael Carter, director of Academic Computing Information Systems/Instruction and Research Information Systems at Stanford University, "What we're hoping to see is several dozen faculty members become authors of instructional software, which will amount to homework assignments in their courses." Students could perhaps check out Macintosh disks at the reserve-book desk of the library, as they would a required book.

Some schools have used the consortium as a springboard to involve other vendors. The University of Michigan's brand-new Microcomputer Education Center will start out with Apples, but expects Zenith and IBM to join in. Stanford is currently negotiating with Hewlett-Packard, Digital Equipment Corporation, and IBM for its Micro-Disk Program.

Although everyone agrees that universities require state-of-the-art tools if computers are to have any real meaning on campus, the Apple Consortium's methods have aroused some controversy.

The resale question has yet to be fully answered. Lewin stressed that most of the universities in the consortium won't permit quick resale of the machines, typically requiring buyers to keep their purchase for at least 24 months. Often, says Lewin, if a buyer wants to resell before 24 months have

passed, the university must have veto power. Under this type of contract, violation may result in dismissal or expulsion.

At least two universities *A+* contacted had no time limit for resale, however. Stanford hadn't completed its order form, but, said Carter, the current draft required only that buyers affirm that the purchase was for their personal use and not for resale. Additional clauses might be added, he said. At Rice University the contract also contains no clause restricting resale. The University of Michigan basically adheres to Apple's suggested agreement, even providing for possible lawsuits against those who resell too soon.

Most nervous are the Apple dealers located near consortium members. "The complaint by the retailers is, 'My tax dollar is supporting your institution, so why should I pay to have you undercut me?'" says Robert Fadden, store manager for Inacom Computer Center in Ann Arbor, Michigan.

Apple is selling directly to the schools, and, as Lewin admits, it's "selling to the universities in such a way that the dealers couldn't compete."

Lewin emphasizes that universities are required to go to an authorized Apple dealer in their area if they can't service and support the machines students buy through the program themselves, so the dealers still have a chance at that business. Also, he said, the retailers will benefit hugely from the expected onslaught of software from the consortium schools.

"This is a long-term opportunity for the dealer to get involved with the community. If it wasn't Apple, who was it going to be? The other two primary vendors in the university marketplace are DEC and IBM," he pointed out. "Would they have cut the dealer in?"

Fadden has been cut in, thanks to a special program at the University of Michigan in which students can make consortium purchases through either the university or Inacom. (Only the University of Notre Dame has a similar setup.) Although he won the bid, Fadden still doesn't like the situation: "I agree with the philosophy, but I don't think it should be done at someone else's expense. Some of the dealers are saying they're not going to be here that long."

Fadden cites a statewide buying plan in Michigan that allows schools to buy products through a dealer; the dealer gets a rebate for each purchase.

Lewin responds, "We understand their situation, but there are 3300 or so institutions—we went to 24. From a proprietary, small-business point of view, yes, if you're an independent businessman, your territory is the world. But if you're a company looking for feedback from universities about your technology, there's not much that the individual businessman can offer in the technology exchange. He can offer a lot in terms of support and service.

"Individual dealers will say, 'I'm losing all those potential sales.' Well, you can get a percentage of something, but you can't get a percentage of nothing. We want to be in business in a serious way, as a frontrunner, three years from now. We need to be thinking about the long-term." **+**

*Applause at the
Office Automation
Conference,
success at Softcon*

PIPELINE/BY STEVE ROSENTHAL

Early Reports from the Field

Apple's Macintosh was a big hit with showgoers at February's Office Automation Conference (OAC) in Los Angeles, but many corporate buyers said they would wait to make significant purchases until they could connect Macintosh to their current machines. Attendees praised the Macintosh's ease of use and said the product's fancy formatting and printing capabilities would be attractive features for office use.

According to several corporate representatives, Macintosh-to-mainframe and Macintosh-to-IBM PC communications were the key pieces of additional software they would need to consider purchases. Apple was demonstrating only a preliminary version of the MacTerminal communications program, and several potential buyers said they wanted to see the finished product and a matching program for the IBM PC.

Apple showed the Macintosh and several finished and developmental software packages at the exhibition. Show attendees who requested a ticket also got a chance to test-drive the Macintosh themselves.

Participants saw a ten-minute demonstration, and then got a chance to work through the "Mousing Around" section of the "Guided Tour of Macintosh" diskette/cassette tutorial. Then, everyone had 15 minutes to try MacPaint and MacWrite.

I asked several groups of people what they thought of the Macintosh after the demonstration, and most were obviously already fond of the machine. Since they were business buyers, however, fondness was not sufficient justification for seeking authorization for company purchases.

"Our people already come in on their own time on weekends to use our Lisas," an insurance executive told me. "Mostly, they're using the Lisas to add fancier type to their memos and reports." When the Macintosh could communicate with his

firm's existing PCs, he thought, he would probably recommend adding several Macintoshes.

A chemical-products data-processing manager told me he personally thought he'd buy a Macintosh—and maybe his firm would, if the Mac could communicate with its mainframe. "They want to network everything, and it'd have to fit right into the network like a PC," he told me.

The Star of Softcon

The Macintosh was the hottest product at Softcon in New Orleans in February, although in theory only the Macintosh software was on display. Large crowds thronged the Apple booth, and other firms showing Macintosh software also drew well.



MARY ROSS

At the Apple booth, the company displayed the Macintosh using MacPaint, MacWrite, a preliminary version of MacPlan, and Think Technologies' Pascal. Another Macintosh was acting as a terminal for a Lisa running UNIX.

Microsoft demonstrated some of its software for the Macintosh to sizable audiences. Microsoft BASIC and Chart should be in stores by the time this report is published, with Word and File arriving later this year.

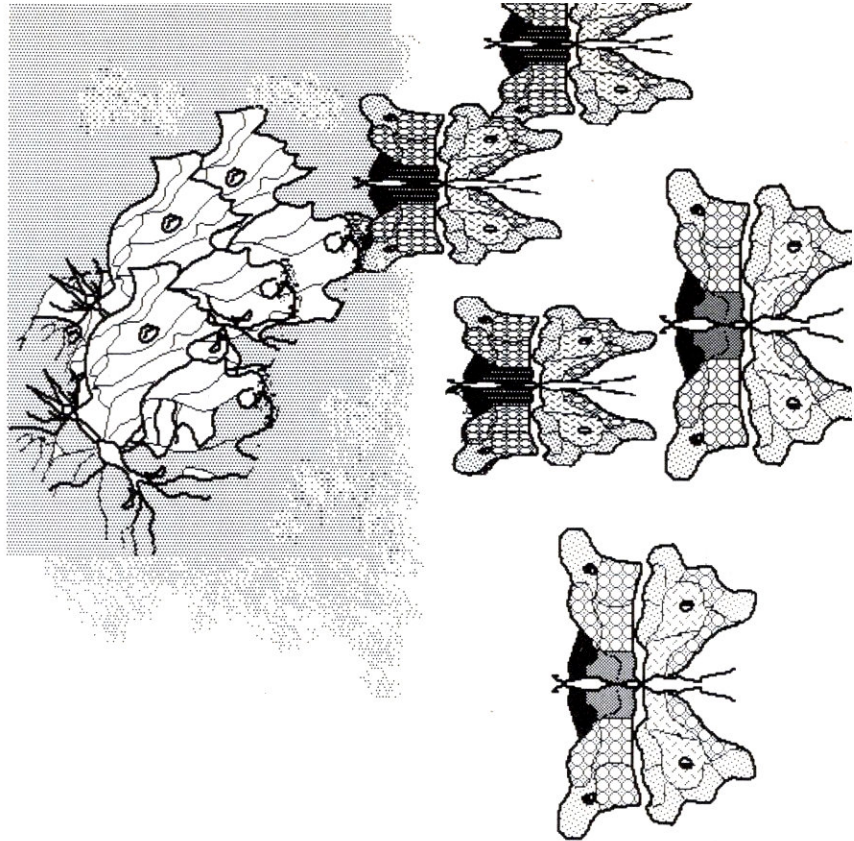
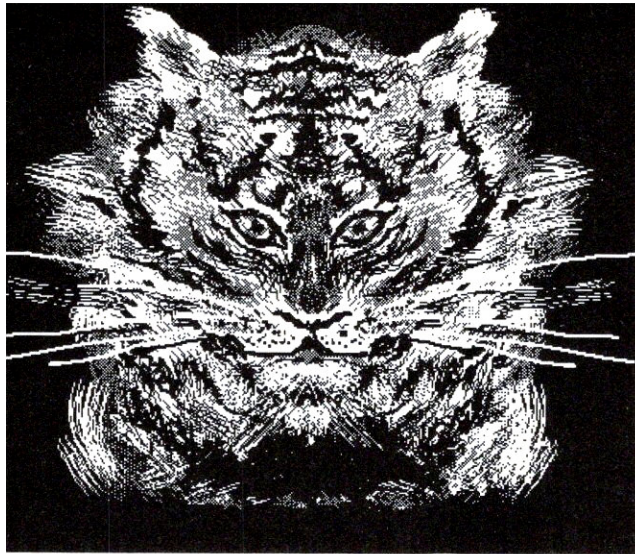
Lotus Development Corporation showed a preliminary version of a product similar to its 1-2-3 program that it is developing on the Mac. This package will have to wait for versions of the Macintosh with more memory than 128K, however.

At least a dozen other firms were displaying Macintosh software in various degrees of completion. Living Videotext had its ThinkTank program running on half a dozen Macintoshes, while at Software Publishing Corporation's booth, a single Macintosh displayed a nearly complete version of PFS:File.

At the side of the arena, Odesta had its Helix database running on a Macintosh. Upstairs on the loge level, Artsci showed a system that mates a telephone with a Macintosh, including software that recalls phone numbers. The firm also had a Rolodex-like database that ran in any of five languages, complete with appropriate national icons.

Several dozen other firms were also displaying Macintosh Development Team posters or pins, and many more reported that they had Macintosh projects underway. The *A+* editors are assembling a preliminary list that shows numerous packages to be released by the end of the year.

Softcon, a new software-only show for large-volume buyers, brought more than 1000 software vendors to the New Orleans Superdome. +



MacPaint Magic

*Conjuring
up images
with the
Macintosh*

Before I tell you about my experiences with and ideas about Macintosh's MacPaint program, I'll introduce myself. I'm an artist who has been addicted to many media beginning with whatever material was available to me in the crib. I have worked with oil, acrylic, watercolor, pastels, colored pencil, etching, woodcuts, silk screen, stained glass, fabric, needlework, typography, and now video and personal computers.

When I started experimenting with the MacPaint program on a Macintosh, I could not locate a manual. Even so, like magic, I was able to draw, paint, erase, flip, spray, move, copy, reverse, mirror, stretch, magnify, design patterns, fill, and mix in type with an array of font styles and sizes.

The MacPaint program is so fast and fluid that I quickly got results that would otherwise have taken piles of

paper, pens, brushes, spilled messes, and days worth of work.

I know that MacPaint is only one of the Macintosh's programs, but if it were the only program for the machine, it alone would make having a Macintosh worthwhile. Every home should have such a tool. As personal computers become more widespread, they will influence our creativity. MacPaint on the Macintosh will affect the way we work because it allows our work to take on an element of play.

Before I launch into some ideas about how to use the MacPaint program for practical applications, here are a few criticisms of the product.

I wish color were available in MacPaint, although if it were, I might never tear myself away from the machine. I wonder why the program's name has the word *paint* in it. Paint can be black and white, but when we speak of painting, we always think of colors.

Another complaint I have is that you can see only one-third of a page on the screen at a time. I can accept the size limitations of the 8 x 10-inch screen. All means of expression have their own inherent limitations, and it is the artist's challenge to work within them and to use what is available to its maximum potential. The limitation of the screen size compared to the page size is a definite impediment, however.

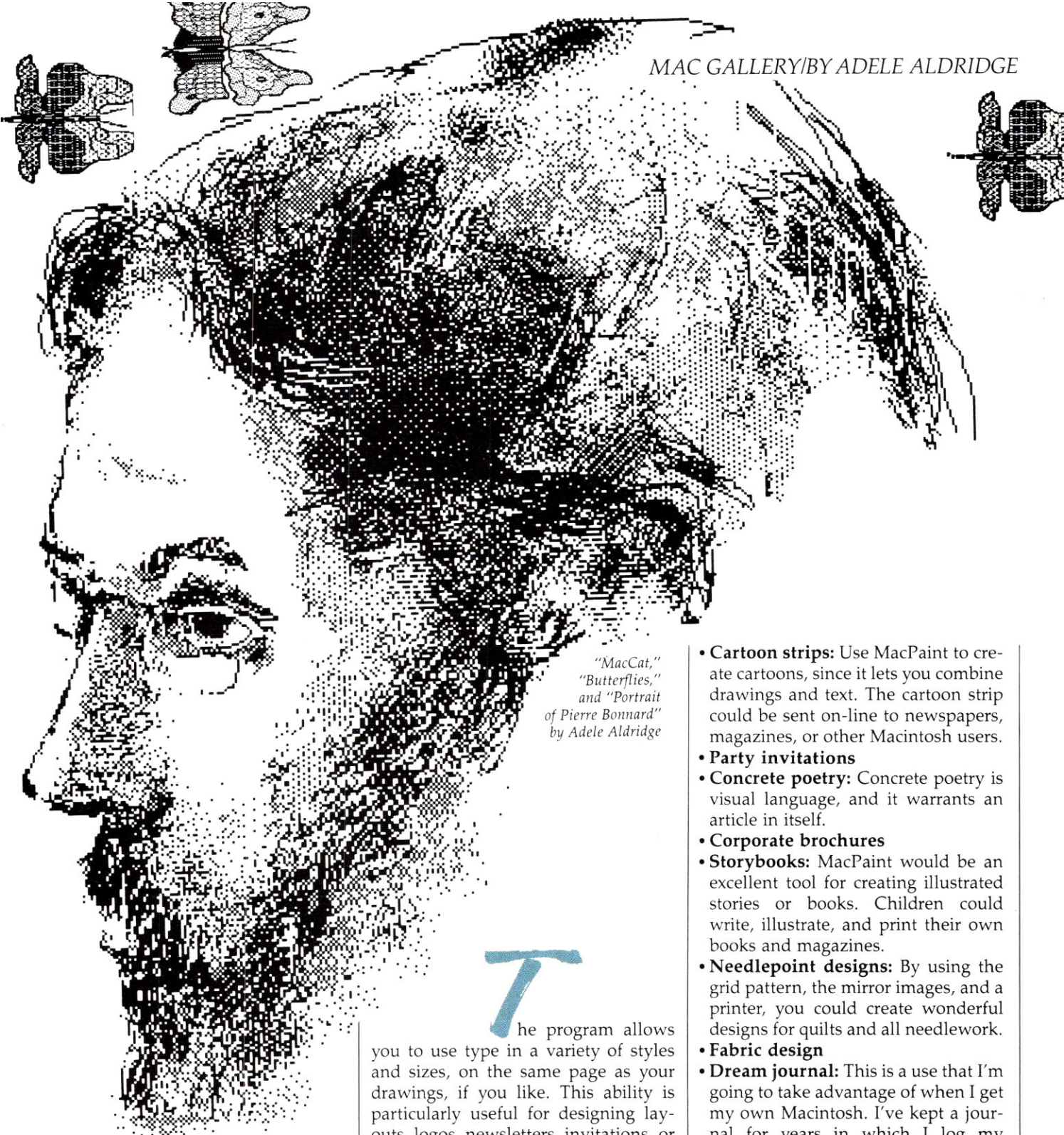
As I began to draw on the Mac, I tended to regard the image of the screen as the size of the entire page. Although the hand icon lets you move the page around, you can't see the entire image at once.

The program does have an option that allows you to see a reduced version of the entire page, but I found it unsatisfactory. What the View Page function actually does is show your drawing in such a reduced form that all the black dots are shrunk and it looks smudgy. It does not give you a true facsimile of what is later printed out. When you draw in black and white, you'll probably use shading, so detail is particularly crucial. The reduced, full-page view of your work does not provide this detail. You can see the image's location on the page, but you cannot tell what you need to correct. Perhaps a way to solve this problem partially would be to add an option that would let you view the page at various stages of reduction. The FatBits option gives you an image that is so large that you can't really see what it looks like, and the View Page option gives you too small a picture.

My third complaint about Macintosh/MacPaint is that I needed another disk drive.

Now that I have my complaints out of the way, I'll discuss some potential uses for it.

I can't imagine why anyone



"MacCat,"
"Butterflies,"
and "Portrait
of Pierre Bonnard"
by Adele Aldridge

wouldn't want a Macintosh with MacPaint. For artists and nonartists alike, it's like having a magic sketchbook. I feel sure the program is going to get even better in the future. I'm not suggesting that everyone should wait until it comes out with color. Not everyone likes color or needs it.

Graphic designers and artists can speed up the creation of anything that they would otherwise do freehand, because MacPaint lets them fine-tune their drawings instantly.

The program allows you to use type in a variety of styles and sizes, on the same page as your drawings, if you like. This ability is particularly useful for designing layouts, logos, newsletters, invitations, or stationery.

Any company that puts out a newsletter or any other printed material will find this program a wonderful, simple-to-use tool. I imagine small presses will love MacPaint, since they can use it with MacWrite to print pamphlets and books without using regular typesetting. The MacPaint manual itself was created on the Macintosh.

Here are some suggestions for general home use of MacPaint as well as for professional artists and writers:

- **Cartoon strips:** Use MacPaint to create cartoons, since it lets you combine drawings and text. The cartoon strip could be sent on-line to newspapers, magazines, or other Macintosh users.
 - **Party invitations**
 - **Concrete poetry:** Concrete poetry is visual language, and it warrants an article in itself.
 - **Corporate brochures**
 - **Storybooks:** MacPaint would be an excellent tool for creating illustrated stories or books. Children could write, illustrate, and print their own books and magazines.
 - **Needlepoint designs:** By using the grid pattern, the mirror images, and a printer, you could create wonderful designs for quilts and all needlework.
 - **Fabric design**
 - **Dream journal:** This is a use that I'm going to take advantage of when I get my own Macintosh. I've kept a journal for years in which I log my dreams as an ongoing research project. Even though I'm an artist, I haven't illustrated my dreams because of the time it takes. Now I can easily integrate my writing, my concrete poetry, and my dream journal all in one. I can keep it on disk so no one can see it, or I can print it out.
 - **Create more Macintosh software:** This is my next project.
- This list of potential uses for this product could go on and on. Why not put your imagination to work? **+**

Macintosh and Lisa

Product News

Mac Disk

Davong System's Mac Disk, a series of hard-disk storage systems ranging from 5 to 40 megabytes, expands the new Apple Macintosh personal computer into a powerful and flexible business tool. Mac Disk's value in handling accounting, database management, and other big data applications, will be strengthened by Mac Tape, a 28-megabyte streaming-tape backup system for protecting data (scheduled for introduction in the third quarter of 1984).

Mac Link (also available in the third quarter of 1984) is a local-area networking system that will allow up to 255 Macintoshes in an organization to share hard-disk storage, communicate with each other, and share other resources, such as printers and plotters. (*List Price for Mac Disk: \$1995, 5-MB; \$2395, 10-MB; \$2795, 15-MB; \$3295, 21-MB; \$3995, 32-MB; \$4995, 40-MB*)

Davong Systems, Inc.
217 Humboldt Court
Sunnyvale, CA 94089
(408) 734-4900

CIRCLE 600 ON READER SERVICE CARD

NPL Information Management System

The NPL database system, released in April, is a nonprogrammer's language for developing complete data-management applications without conventional programming. It is modeled after other fourth-generation languages that have gained wide acceptance on mainframe computers. NPL programs look like English. Users say what they want—the computer figures out how to do it.

Because the sentences can include phrases for sorting, computation, totaling, and so on, the NPL System is suitable for a wide variety of file-management functions, such as personnel records, customer information, payroll, and inventory.

The Macintosh version of NPL is fully integrated into the Macintosh environment. Users can build NPL sentences by using the mouse to select keywords from dynamically ad-

justed pull-down menus. These programs can then be run immediately or stored in files.

Users can paint a form in a window for entering and editing the data. Automatic validation is also available for testing values, ranges, and data types.

All standard Macintosh editing capabilities (such as cutting and pasting) will be available for use in both forms and programs.

Apple/NPL is available for the Apple II and Apple III.
DeskTop Software Corporation
228 Alexander Street
Princeton, NJ 08540
(609) 924-7111

CIRCLE 601 ON READER SERVICE CARD

Art Department

Designed for use with LisaDraw, this graphics library, which comes on one 5¼- or 3½-inch diskette, contains more than 300 ready-to-use illustrations and figures. Art Department uses LisaDraw features such as sizing, on-line customizing of images with graphics or text, and the ability to change shading or select portions or groups of images for presentation.

Twelve general categories of illustrations are available: maps and flags, an extended alphabet, arrows and accent characters, the business environment (including symbols for various methods of communication, economic indicators, office equipment and furniture, modes of transportation, and so on), decorative elements, demographics, dotted lines and shapes, everyday life (including drawings of objects and concepts associated with the home and outdoors), people and other living things, standard graphs and axes, standard forms, and symbolic images (including images of idioms and abstractions, such as time and thinking). (*List Price: \$195*)

Requires: Lisa 2 Series; LisaDraw Business & Professional Software
143 Binney Street
Cambridge, MA 02142
(617) 491-3377

CIRCLE 602 ON READER SERVICE CARD

Wizardry for the Macintosh

Wizardry for the Macintosh is a brand-new game. Reprogrammed for the new computer, this fantasy game from Sir-Tech Software allows one or more players to adventure in a dark and mysterious maze, traveling from dungeon to dungeon, fighting monsters, and winning a variety of arcane items. Wizardry's designers expect to release the Macintosh version this spring.

Sir-Tech Software, Inc.
6 Main Street
Ogdensburg, NY 13669
(315) 393-6633

CIRCLE 603 ON READER SERVICE CARD

Mac-Forth

Mac-Forth, an interactive, multitasking programming environment for the Macintosh, provides system developers and users with the ability to develop their own applications.

Mac-Forth integrates interactivity, speed, and flexibility with the graphics windows, menus, mouse selection, and file structure of the Macintosh user interface. (*List Price: \$24.95, Single Systems License*)
Creative Solutions, Inc.
4801 Randolph Road
Rockville, MD 20852
(301) 984-0262

CIRCLE 604 ON READER SERVICE CARD

Fast Track

Fast Track is a software system for a series of application packages that require interactive tracking of dollars, units, hours, or materials. Fast Track makes extensive use of the Macintosh user interface, incorporating graphics and editing features, in the following packages:

The Time Manager is a professional time-and-billing system with multiple sorting levels and categories (by client, job, date, and work order for expenses/hours).

The Office Planner uses Macintosh quick-draw features to depict furniture size, shape, and arrangement, and includes scaling and rotation of objects.

*A look
at new products
to complement
your Macintosh
or Lisa.*

Material Manager is a material-inventory system that maintains units and dollars by categories and other user-specified sorting parameters. This system can track and report fixed assets as well as nondurable goods. A remote MSI 88 terminal permits the use of bar codes. (*List Price: \$99.95 per application, Single System License*) Creative Solutions, Inc.
4801 Randolph Road
Rockville, MD 20852
(301) 984-0262

CIRCLE 605 ON READER SERVICE CARD

DS220 Multimode Matrix Printer

Designed to operate with high-performance micro- and mini-based business systems, the DS220 Multimode Matrix Printer combines three different printing capabilities: correspondence printing for word processing, draft-quality printing for high-speed data processing, and dot-addressable graphics.

In Correspondence mode, the DS220 generates an 18 x 48 dot matrix for near-letter-quality appearance. Using a high-resolution two-pass-mode technique, the DS220 prints at 40 characters per second. Included as standard features are two correspondence-quality fonts, two memo fonts, variable-pitch draft fonts, and a special micro-character set. Also resident are seven international character sets. For print-intensive applications, the DS220 operates at 220 cps utilizing bi-directional logic-seeking printing. The high-resolution dot-addressable graphics feature of the DS220 has the ability to print up to 217 columns for spreadsheets and then graphically output the results.

Compatible with virtually all micro-computers, the DS220 includes both serial and parallel interfaces as standard features along with a 2000-character buffer. (*List Price: \$1995*)

Requires: Apple II, II Plus, IIe, or Lisa
Datasouth Computer Corporation
4216 Stuart Andrew Blvd.
Charlotte, NC 28210
(704) 523-8500

CIRCLE 606 ON READER SERVICE CARD

Coming Up in Product News

Lotus 1-2-3, from Lotus Development Corp.

Participatory Novels, from Infocom
Run for the Money, from Scarborough Systems, Inc.

Macintosh 5-Megabyte Cartridge Winchester, from Tecmar, Inc.

The Candy Apple IEEE488 Interface for Macintosh and Applebus Peripherals, from Tecmar, Inc.

Telephone/Modem Interface for the Macintosh, from Tecmar, Inc.

PFS:File and PFS:Report, from Software Publishing Corp.

Professional Tax Planner, Estate Tax Planner, and Personal Tax Planner, from Aardvark/McGraw-Hill

Home Accounting, from Ask Micro, Inc.

Millionaire Tycoon, Squire, and Baron, from Blue Chip Software
Training Programs, from ATI

The Client Management System, from Compu-Law, Inc.

The Home Accountant, from Continental Software

Dr. Logo, from Digital Research, Inc.
Habadex (telephone management), from Haba Systems, Inc.

Sargon III, The Calendar, The List Manager, The Planner, Butter (spreadsheet), and **Go**, from Hayden Software Company

Telofacts I, Telofacts II, Mac Tutor, Brain Games, Mac Communications Package, from Dilithium Software

Communications System, from Hayes Microcomputer Products, Inc.

The Sales Edge, The Management Edge, The Negotiation Edge, from Human Edge Software Corp.

Megawriter, Megaspeller, Megafinder, from Megahaas Corp.

ThinkTank, from Living Videotext, Inc.

Microsoft Chart, Microsoft Word, Microsoft File, from Microsoft Corp.

The Graphic Magician, Transylvania, The Quest, and The Coveted Mirror, from Penguin Software, Inc.

Datatalker, 3780/3270 bisync. emulation, from Winterhalter, Inc.

MasterType, Songwriter, PictureWriter, Phi Beta Filer, and **PatternMaker**, from Scarborough Systems, Inc.

IFPS/Personal, from Execucom
CRTplus, from Aurora Systems, Inc.
From AgDisk/Harris Technical Systems:

Financial Mangement, Series One

**Machinery Management
Corn/Soy Bean Management
Crop/Livestock Profit Projector**

Seven Multiplan Templates, including **Business Management, Machine Management, Swine Farrowing, Swine Finishing, Crop Management, Cow/Calf Management, Feedlot Cattle Management**

ELECT ORACLE

THE DELPHI TELECOMMUNICATIONS SERVICE PROVIDES A WIDE RANGE OF INFORMATION, COMMUNICATIONS, AND ENTERTAINMENT.

When the ancient Greeks sought the wisdom of the gods, they made a pilgrimage to the Temple of Apollo at Delphi. There the God Of Truth, through the prophecies of a priestess, enlightened the pilgrims who had made the journey along the Sacred Way and who had purified themselves in the sacred Castalian Spring.

Now, 2500 years later, a new, electronic oracle—Delphi, from General Videotex Corporation—informs modern Americans by offering them a variety of information, communication, and entertainment services through their personal computers. Telephone lines replace the Sacred Way, the ritual of entering passwords supplants the purification rites, and mainframe computers take the place of the priestess.

Since it began operating in February 1983, Delphi has attracted about 1000 subscribers. The system uses a menu-driven approach to let subscribers navigate around the system. The main menu lists general sections, and submenus list individual services.

Delphi's information services reside in News, Library, Financial Services, On-line Market, Travel, Appointment Calendar, and Profile sections.

The News section, provided by ITT/Dialcom, Inc., contains stories from the day's UPI newswire and is divided into

17 options for easy and selective searching. Six options provide business, sports, broadcast, state, regional, and national and international news. Five options hold the schedules for the Senate, House, president, White House, and Capitol Hill. Other options contain miscellaneous stories.

One option, Profiled Stories, lets you search the entire News section using specific keywords. This type of searching, called free-text, retrieves all stories containing the keywords. For instance, typing APPLE and COMPUTER will net all stories about Apple computers and Apple Computer, Inc. Those keywords could also pull out a story about an orchard whose owner uses a computer to keep track of his apple inventory. The more specific the keywords, the greater your chance of retrieving stories pertaining to your particular interest.

The Library section contains services that provide reference information. It consists of the Kussmaul Encyclopedia, the Research Library, the Librarian, Delphi Info, and the Dialcom Library.

The Kussmaul Encyclopedia contains more than 20,000 entries, with about half of them cross-referenced to other entries. To use this service, simply type in a word, such as *Delphi*, and the computer displays the entry and a list of cross-references. If the word does not

match an entry, the computer deletes letters one by one from the end of the word until an entry matches the beginning letters.

The Research Library, produced by Dialog Information Service, Inc., provides about 200 specialized databases on every topic from agriculture to world textiles. This service uses a more complicated free-text searching procedure than that of the Kussmaul Encyclopedia. A separate manual is sent to subscribers who sign up for the Research Library.

The Librarian, operated by COIN, Inc., is an off-line research service. A staff of trained researchers scours various databases for information about your particular subject and then sends the results to you via Delphi. COIN also offers optional hard-copy delivery.

Delphi Info provides various information about the Delphi system, such as Telenet and Datapak/Telenet telephone numbers and rates.

The Dialcom Library, from Dialcom, Inc., contains more than 100 programs that can perform a variety of tasks, from balancing your checkbook to performing statistical analyses. All documentation for these programs is available on-line.

Turning to the Financial section, Delphi offers investment advice and a brokerage service. Investment advice comes from Security Objective Services, which

R O N I C C L E

offers an extensive electronic-investment newsletter. This firm reviews stocks and bonds by the week and year, evaluates particular securities, and makes recommendations. Another firm, Initial Public Offerings, Inc., gives advice about new stocks and funds through its on-line newsletter.

Once you've figured out what stock to buy or which fund to invest in, you can open an account with North American Investment Corporation. You receive a 10% discount on commissions, and you can make transactions through Delphi 24 hours a day, seven days a week. North American Investment also offers an investment research and recommendation service.

Now that you've made a fortune, one way to spend it is through the On-line Market, an electronic shopping service that consists of a Catalog and a Bazaar. The Catalog lets you order items from various merchants, and the Bazaar functions as a large marketplace where subscribers meet to buy and sell goods.

The Travel service posts airline schedules and allows you to make airplane, hotel, and automobile reservations, and the Appointment Calendar service keeps track of appointments for up to one month in advance.

One of the most interesting places in Delphi is the Iamwhois service in the Profile section. Iamwhois lists all subscribers in alphabetical order according to their member name, which can be a real name, nickname, or pseudonym.

Iamwhois lets you post general information about yourself, such as what type of computer you own, location, and hobbies, for other subscribers to read. Subscribers can contact others with similar interests, using one of Delphi's four communications services.

The Bulletin-Board section is a place to post public messages. It is divided into five categories: Computers, Delphi, General, Interest Groups, and Reviews—with each category listing specific boards. For example, the Computers category contains boards dealing with all major computer types, as well as CP/M systems and modems.

The boards seemed scarcely used when I reviewed this system, most likely a result of Delphi's recent start-up in February 1983. The Software Review board held a couple of half-hearted reviews, while the Gossip board contained not a single juicy tidbit. The messages are not numbered, so you don't know how many messages are on a board. You can avoid reading old messages by requesting messages after a certain date. Two nice features about the bulletin boards are the ability to save a message in your electronic mailbox and to reply directly to a message's author while you're in the Bulletin-Board section.

Electronic mail allows you to send letters to any subscriber's electronic mailbox. You can even send mail to Oracle. Fast and easy to use, the mail service lets you forward one letter to multiple mailboxes, file letters for future use, and

even send letters to subscribers of CompuServe and The Source.

Conference allows you to hold "live" conversations with one or more other subscribers. Whatever you type in is sent to the other subscribers' terminals. Like a large party line, conversations can get confusing when more than a half-dozen subscribers "talk" at the same time. You can always get a word in edgewise by typing in text, however. Most subscribers converse using their member names, the name listed in Iamwhois, but for those who desire anonymity, pseudonyms are acceptable.

Delphi Oracle is a feedback service rather than a true communications service. The Oracle consists of a team of experts who answer questions about the system, service, telecommunications, and just about anything else relating to computers. Answers, prophecies, and other items of arcane wisdom are sent within a few days after requests are made via electronic mail.

Delphi offers a variety of interesting and innovative entertainment services in the Games, Writer's Corner, and Infomania sections. Delphi would boast an even more impressive array of games if all those listed in the manual were actually running. General Videotex's customer service reports, however, that many are still under development. Still, you have quite a selection. The Games section breaks down into Adventures, Board Games, Delphi Casino, Kiddie Korner, Logic Games, and Sports



Treat Yourself to
More Color
More Detail...

Treat Your Apple //e to *HGR6*

Imagine — hi-res graphics with 16 colors. 560 x 192 dots. Your Apple //e with Extended 80-Column Card has the capability. Now HGR6 makes it easy to use by adding new HGR, GR, and HCOLOR functions directly to Applesoft. Change your current programs for 16 colors — or create new ones with twice the detail!

HGR6 lets you easily save double-res images, too. And “compress” them to take less disk

space. Viewing both regular and double hi-res images is a snap with the slide show program included.

HGR6 is a real treat at only \$49.95. Want more color and detail? Get HGR6 today!

Available at your local computer dealer or direct from ALF. Includes both DOS 3.3 and ProDOS versions. Apple is a trademark of Apple Computer Inc.

ALF

ALF Products Inc. 1315F Nelson St. Denver, CO 80215 [303] 234-0871 Telex: 4991824

Games. Adventures features two games, Zork and the original Adventure, perhaps the best-known of all adventure games. This section also includes Star Trek, the classic game of interstellar Klingon hunting.

Board Games contains backgammon and Othello, as well as Qubic, a three-dimensional tic-tac-toe game, and Hexapawn, a pawns-only game of chess played on a 3 × 3-square board. Regular chess and checkers are not available.

Delphi Casino brings a touch of Monte Carlo by offering craps, darts, roulette (even the Russian variety), and poker.

Kiddie Korner, a relatively new service, holds a game called Bug, which improves eye/hand coordination under time pressure. The game has enough creativity to capture a child's attention, although the graphics could be more imaginative.

The five logic games stress mathematical skill, logic, and analytical ability. Mostly, they require you to juggle

▶ **Like the reader of mystery novels, you must analyze clues to find the hideous Wumpus before shooting it full of arrows.**

numbers to fulfill an objective. Of the lot, an old favorite called Wumpus and an updated version called Super Wumpus hold the most interest. Both require that you explore a dungeon setting as in an adventure game, but, like the reader of mystery novels, you must analyze clues to find the hideous Wumpus before shooting it full of arrows.

The sports games, football and boxing, are single-player games.

Writer's Corner offers aspiring writers and programmers the opportunity to be published. Writers can create a short story or poem and submit it to Delphi's editors. Programmers can write a program in BASIC, Pascal, COBOL, or FORTRAN and then compile it. If the Muses inspire your prose or programming, Infomania will publish it. If "best-sellers" find their way into other parts of Delphi, their authors could receive royalties.

Infomania contains creations from Writer's Corner as well as other subscriber-contributed material. Short sto-

ries and poems are found under Author. The Newsletter service holds numerous subscriber-written newsletters covering many topics. Member's Choice carries programs that may or may not be useful. For example, PAMS lists bulletin boards outside of Delphi. Reporter churns out lengthy, turgid sentences written in bureaucratic jargon.

Infomania also contains an interesting service called Collaborative Novel. You read what someone has already written and then continue the story. Because the Muses cannot visit everyone, ideas and

style are often uneven; but that's part of the charm. Occasionally, someone becomes malicious. In Star Tracks, a Star Trek spoof, Captain Quirk and the Enterprise participated in all sorts of interesting interstellar incidents until a user with questionable motives wrote a paragraph that blew up the Enterprise. Fortunately, the next writer noted that the Enterprise had carried the Genesis machine and the star-hopping story line continued.

The manual states accurately that "Delphi was designed for humans." The system is easy to use and features

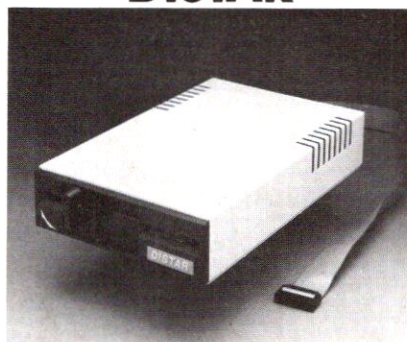
THE FIRST 169.00 APPLE DRIVE AND IT WORKS!

- All Units 100% Tested
- 100% Apple & Franklin Compatible

DISTAR

For use with the Apple II, Ile & Franklin Computers

- in-use zero track sensor
- direct drive spindle motor
- slim line configuration
- automatic DOS selection
- positive disc lock lever
- power indicator light
- cabinet and cable included
- six month warranty



**5 1/4 Slim line
Apple II, Ile
& Franklin
Floppy Disc
Drive**

DISTAR Apple drive is not an adaptation of other mechanisms. DISTAR is a wholly engineered unit for the Apple II, Ile and Franklin. DISTAR's direct drive system allows for quieter operation, more accurate tracking and longer life than conventional belt driven units.

We accept check, money order, VISA or MasterCard (include number and expiration date). Please include \$3.50 for shipping, handling and insurance in continental U.S. California residents add 6% sales tax.

BURKE AND ASSOCIATES, authorized representatives and distributors.
1720 Los Angeles Avenue, #221 • Simi Valley, CA 93063 • (805) 584-3220

Apple II and Apple Ile are registered trade marks of Apple Inc.

CIRCLE 450 ON READER SERVICE CARD

three prompts for different levels of expertise. The menu-driven approach helps the beginner navigate through the system. An experienced subscriber may eliminate the menus and receive an explanatory prompt. An expert can choose to receive only a one-word prompt.

All services contain a Help option, which describes and discusses how to use all the commands. The Help command is so thorough that it even explains the command Help.

For new subscribers, the main menu offers a Guided Tour, which is a cross between a free-running demonstration and a programmed-instruction tutorial. It describes the services and features of Delphi, discusses how to access them, and lets you set various technical parameters such as passwords, prompts, and screen dimensions. You may leave the tour after any screen.

The 162-page manual contains clear and thorough instructions for using Delphi. Each section of the manual corresponds to one of the general sections on the system. The manual also lists the programs in the Dialcom Library, the databases in the Research Library, and Tymnet telephone numbers.

The manual, which was printed before Delphi was on-line in its current

form, possesses a few errors that present minor inconveniences. Delphi is only available through Telenet, so the Tymnet numbers are useless. Some of the on-line sections have been changed or merged with other sections, so the manual may not exactly describe a particular

▶ Subscribing to Delphi is a lot like buying a car. The base price provides a standard model, but options can boost the price.

section. Finally, the manual does not contain an index. Until you become familiar with each section, finding a particular service requires a bit of hunting.

So how much does the wisdom of the gods cost? Well, subscribing to Delphi is a lot like buying a car. The base price provides a standard model, but options can boost the price significantly. You can pay with MasterCard, Visa, or American Express, or you can set up a

\$25 noninterest-bearing account and be billed directly.

Delphi charges a one-time \$49.95 registration fee and \$20 per hour during prime office time, from 8:00 A.M. to 6:00 P.M. local time Monday through Friday, and a reasonable \$5 per hour during home time, which is any other time. Using Telenet, however—the only way to reach Delphi—will cost an additional \$1 per hour during home time and \$4.50 per hour during office time.

Some services are optional and cost extra. News, Dialcom Library, and Travel are \$11 per hour during home time and \$15 per hour during office time. The Research Library from Dialog costs a whopping \$25 to \$300 per hour extra. Librarian, from COIN, costs \$25 per hour, with a \$25 minimum fee.

Delphi provides 25,000 characters or 24K of storage free and charges \$0.05 for each additional 1000 characters. Thus, 128K of storage space will cost about \$6 per month.

General Videotex plans to add many services to Delphi in the near future, some carrying additional premiums. The firm is seeking regulatory approval to offer electronic banking, which would cost \$1.75 per month extra. Plans exist to add Comp*u*store, a shop-at-home service that could add a \$25 annual fee

Now you can monitor and control the world (or at least your part of it) with a little help from **APPLIED ENGINEERING**

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, $\pm 5V$, $\pm 2.5V$, $\pm 1.0V$, $\pm 500MV$, $\pm 250MV$, $\pm 100MV$, $\pm 50MV$, or $\pm 25MV$.
- 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.

8 BIT, 8 CHANNEL A/D

- 8 Channels
- 8 Bit Resolution
- On Board Memory
- Fast Conversion (.078 ms per channel)
- A/D Process Totally Transparent to Apple (looks like memory)

The APPLIED ENGINEERING A/D BOARD is an 8 bit, 8 channel, memory buffered, data acquisition system. It consists of an 8 bit A/D converter, an 8 channel multiplexer and 8 x 8 random access memory.

The analog to digital conversion takes place on a continuous, channel sequencing basis. Data is automatically transferred to on board memory at the end of each conversion. No A/D converter could be easier to use.

Our A/D board comes standard with 0, 10V full scale inputs. These inputs can be changed by the user to 0, -10V, or -5V, +5V or other ranges as needed. The user connector has +12 and -12 volts on it so you can power your sensors.

- Accuracy: 0.3%
- Input Resistance: 20K Ohms Typ

PRICE \$129.00

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 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 1/2 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 \$79.00

DIGITAL INPUT/OUTPUT BOARD

- Provides 8 buffered outputs to a standard 16 pin socket for standard dip ribbon cable connection.
- Power-up reset assures that all outputs are off when your Apple is turned on.
- Features 8 inputs that can be driven from TTL logic or any 5 volt source.
- Your inputs can be anything from high speed logic to simple switches.
- Very simple to program, just PEEK at the data.
- Now, on one card, you can have 8 digital outputs and 8 digital inputs each with its own connector. The super input/output board is your best choice for any control application.

The SUPER INPUT/OUTPUT board manual includes many programs for inputs and outputs. A detailed schematic is included.

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 \$69.00**

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 IIe.

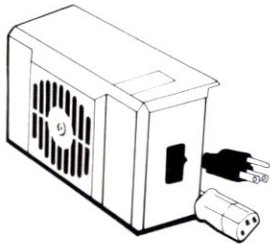
Applied Engineering's products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle three year warranty.

Most Orders Shipped Same Day
Texas Residents Add 5% Sales Tax
Add \$1.00 If Outside U.S.A.

Send Check or Money Order to:
APPLIED ENGINEERING
P.O. Box 470301
Dallas, TX 75247

Call (214) 492-2027
7 a.m. to 11 p.m. 7 days a week
MasterCard, Visa & C.O.D. Welcome
No extra charge for credit cards

**Cooling Fan for
APPLE II, II+ & IIe***



- Snaps on the side of APPLE II, II+ and IIe* enclosures • Eliminates overheating problems, thereby boosting reliability and operation life of computer • Switch on front serves as power switch for fan, computer, and extra outlet • Line surge protection • Size: 7" L x 2 3/8" W x 4 1/4" H • Wt.: 2 lbs.

APF-1 \$49.95

**APPLE™ Compatible
5 1/4" Disk Drive**



- Uses Shugart SA390 Mechanics • 143K formatted storage • Color matches Apple Computer • Works with Apple Controller or other Apple-compatible controllers • Complete with connector — just plug into your disk controller card • 35 tracks • Size: 6" L x 3 1/2" W x 8-9/16" D • Wt.: 4 1/4 lbs.

ADD-514 . . . \$195.95

**QUALITY COMPUTER PRODUCTS
FOR APPLE AND COMMODORE**

Jameco's 10th Anniversary 1984 Catalog is Now Available

JE520 Series

**VOICE SYNTHESIZER
FOR APPLE AND COMMODORE**

Add speech capability to your Apple II, II+, IIe*, Commodore 64 or VIC-20 computer with JAMECO's JE520 Series Voice Synthesizer. Speech — the most effective means of communication available to man — is now immediately available for your computer.

Applications

- Education • Entertainment • Instrumentation
- Games • Telecommunications • Handicap Aids

JE520 Features

- More than 260 basic words, prefixes and suffixes, which allow the formation of well over 500 total words.
- Allows music graphics and speech simultaneously.
- Programs in BASIC and/or assembler.
- Very understandable and realistic male voice.
- Built-in amplifier, speaker, volume control and audio jack.
- Plug-in user-ready with complete documentation and sample software.

The JE520 will plug right into your computer and be talking in minutes. It produces a very clear, natural male voice. The outstanding speech quality is produced using National Semiconductor's Digitalizer™ speech processor IC with 4 custom memory chips.



JE520CM

JE520AP

Case Size:
7 1/4" L x 3 1/4" W x 1 3/8" H

JE520CM For Commodore \$114.95
JE520AP For Apple \$149.95

CABLES



RS232 Type

Part No.	Style	Length	Price
CDB25P-4-P	J	4'	\$13.95
CDB25P-10-P	J	10'	16.49
CDB25P-4-S	L	4'	13.29
CDB25P-10-S	L	10'	15.49



"Centronics" Type

Part No.	Style	Length	Price
CEN36M-5-M	J	5'	\$19.95
CEN36M-15-M	J	15'	26.95
CEN36M-5-F	L	5'	22.95
CEN36M-15-F	L	15'	28.95

**IBM PC Parallel Printer
Adapter Type**

(CDB25 Male to Centronics Male)

Part No.	Length	Price
CDB25P-5-CEN36M	5'	\$17.95
CDB25P-15-CEN36M	15'	22.95

Style J Male to Male
Style L Male to Female

We stock over 200 different cables. If you don't see what you need, please call.

5 1/4" Diskettes

SSDD = Single Sided Double Density
DSDD = Double Sided Double Density

ULTRA MAGNETICS

Part No.	Description	Boxed	Price
UM51401	SSDD with Hub Ring	10	\$24.95
UM52401	DSDD with Hub Ring	10	32.95

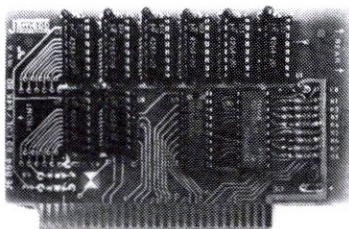
SK (ESKEI)

Part No.	Description	Boxed	Price
SK1D	SSDD with Hub Ring	10	\$20.95
SK2D	DSDD with Hub Ring	10	26.95

All diskettes are soft-sectored and have hub rings. Bulk prices available on request.

For:	Use
Apple II, II+ and IIe*	SSDD
Atari	SSDD
Commodore 64, VIC-20	SSDD
IBM PC, PC Jr.	DSDD

**80-Column plus 64K RAM
for your APPLE IIe***



Now you can double the memory capacity and get an 80-column display format for your APPLE IIe* computer at an affordable price. Just plug the JE864 card into your APPLE* and expand your display to 80 characters per line. Perfect for word processing. The JE864 also features 64K bytes of additional memory to allow programming not possible with standard APPLE IIe* computers. Complete documentation included.

Board: High density board design squeezes 64K bytes of RAM onto a 2 1/2" x 4 1/2" board • Fully tested to assure proper operation.

Uses: Word processing — displays 1000 more characters per screen • Extra memory allows running of extremely large programs • Ultra High Resolution Graphics capability.

JE864 \$149.95

**Numeric/Auxiliary
Keypad for your
APPLE IIe***



The JE614 is a newly introduced numeric/auxiliary keypad for the APPLE IIe*. It offers the flexibility of a 10-key pad and the convenience of 23 directly accessible functions. Screen manipulating functions make word processing a snap and cursor controls make the keypad ideal for VisiCalc** users. The JE614 Keypad is housed in a durable metal enclosure and is color-coordinated with your APPLE IIe computer. Operation of the keypad can begin within minutes from unpacking. Special functions include: Home, Clear, Clear to End of Screen, Scroll-Up, Scroll-Down, Tab, Delete, Left, Right, Up and Down. Each key has auto-repeat. Size: 5 7/8" L x 4-3/16" W x 1 1/4" to 2 1/2" Slope.

JE614 \$89.95

\$10.00 Min. Order - U.S. Funds Only
Calif. Residents Add 6 1/2% Sales Tax
Shipping - Add 5% plus \$1.50 Ins.
Send S.A.S.E. for Monthly Sales Flyer!

Send \$1.00 Postage for your
FREE 1984 JAMECO CATALOG
Prices Subject to Change



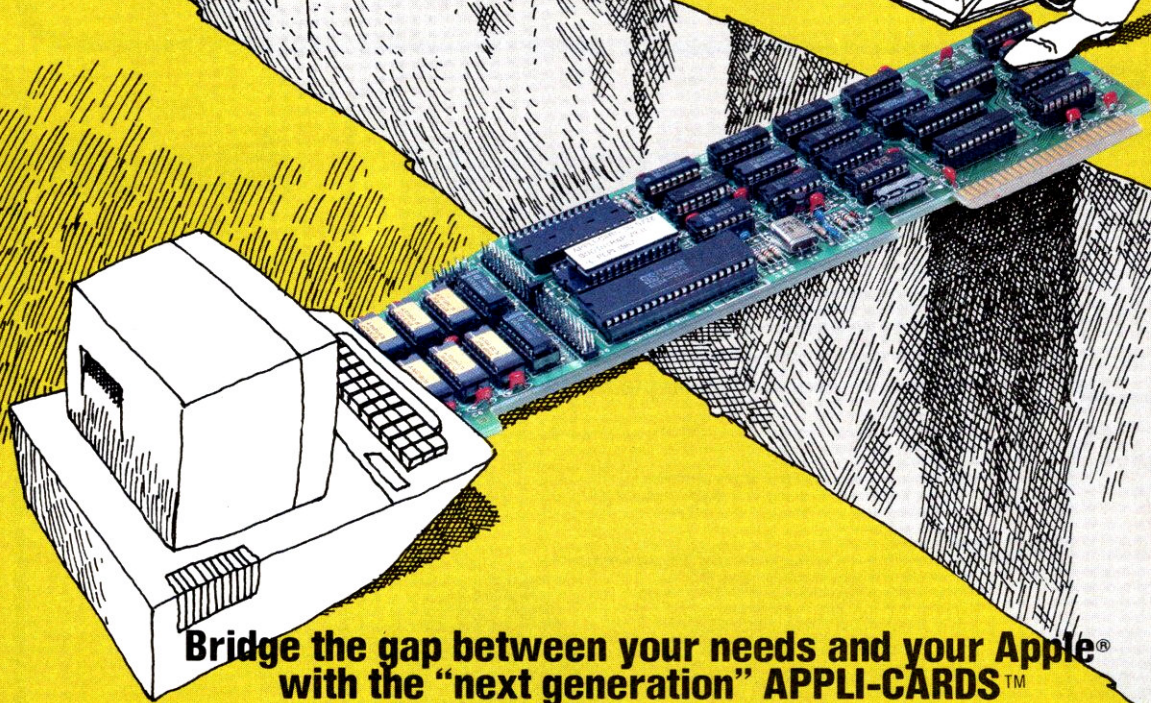
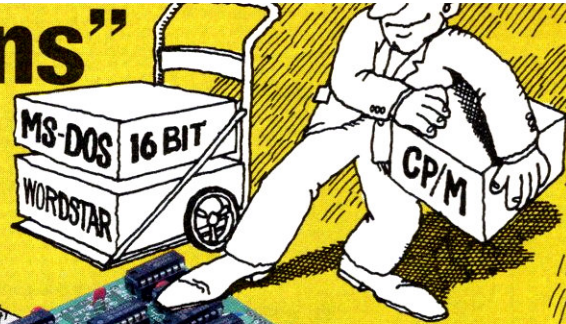
**1355 SHOREWAY ROAD
BELMONT, CALIFORNIA 94002**

**Phone Orders Welcome (415) 592-8097
Telex No. 176043**

5/84
Dealer inquiries invited. For Technical Information, call (415) 595-3994

*APPLE and APPLE IIe are registered trademarks of APPLE Computers.
**VisiCalc is a registered trademark of Visi Corp. Inc.

Bridge the "applications" generation gap.



Bridge the gap between your needs and your Apple® with the "next generation" APPLI-CARDS™ from Personal Computer Products, Inc.

CP/M® APPLICATIONS WITH APPLI-CARD™

It doesn't matter one bit if you're in business, science or education, because the APPLI-CARD bridges the gap between you, your Apple, and the powerful world of CP/M.

The APPLI-CARD is a plug-in board with complete hardware and software which allows your Apple to run the thousands of CP/M application programs available today!

Features:

- **Popular CP/M Applications** such as dBASEII, SuperCalc, and WordStar are now compatible on your Apple!
- **Powerful 6MHz Processor** to increase program execution speed by up to 3 times faster!
- **On-Card 64K RAM** which eliminates the older slower method of sharing the Apple's memory!
- **In the Apple 6502 Mode** use the APPLI-CARD memory for a high speed electronic disk drive!
- **40-Column Scrolling and 70 Column Hi-Res**, two distinct operating modes for those who do not have 80-column video cards. APPLI-CARD will also support most popular 80-column video boards!
- **Compatibility** with the Apple II, II Plus, IIe, and Apple-compatible machines!
- **Expandability!** The APPLI-CARD will grow with your needs. Optional RAM Extenders add either 64K or 128K of additional memory. Use this extra memory with our APPLI-DISC™ software as a high speed electronic disk drive which in many instances eliminates the need for an expensive 2nd or 3rd mechanical disk drive.

APPLI-CARD FOR THE APPLE III WITH FREE WORDSTAR®

The "new generation" Z-80 card that not only opens the door to the thousands of CP/M application programs available, but turns your Apple III into an industry standard word processor. Make your Apple III a powerful CP/M computer!

Features:

- **Package includes** a \$495 word processor, **WordStar, FREE!**
- **Compatibility** with other popular CP/M applications programs such as SuperCalc and dBASEII.
- **Speed, speed, speed!** The APPLI-CARD gives you a powerful 6MHz processor. Increase your program execution speed because your card will be twice as fast (or more) than other Z-80 cards!
- **On-board 64K-128K RAM!** The APPLI-CARD has 64K RAM standard, but you can add up to 128K any time your heart desires!
- **A true Apple SOS implementation.** The APPLI-CARD is fully compatible with your SOS environment!
- **Supports standard Apple III peripherals!** Use the Apple III interface and your APPLI-CARD is compatible with your favorite Apple III peripherals including the Profile Hard Disk System.
- **It grows on you!** The APPLI-CARD grows with your needs. A built-in expansion connector opens the door to various add-on products. Also, you can add new peripherals to your Apple III and your APPLI-CARD will use these through its sophisticated software design.

THE 16-BIT MS-DOS™ "88CARD"™

Now you can upgrade your Apple II, II Plus or IIe to the speed and power of the large memory space of a 16-Bit System! Your Apple all of a sudden becomes a 16-bit microcomputer! The "88CARD" combines cutting edge hardware technology with the comfort and reliability of your Apple!

Features:

- **The 88CARD Hardware includes** a fast and powerful 5MHz 8088 microprocessor and 64K of on-card memory. Add this to a 64K Apple to give a total of 128K for execution and development!
- **With the same 8088 Microprocessor** as the IBM PC, you can run standard MS-DOS 16-bit software.
- **Increased storage space** for professional applications. The 88CARD offers a larger Data-Base storage capability for your software. Many applications have more than double the available working space with their 16-bit rather than in the 8-bit version.
- **Increase the efficiency** of your Apple, while increasing your productivity, and bring your Apple to the "Next Generation" 16-bit world.

™
 **Personal Computer Products, Inc.**

THE LEADER IN COPROCESSING TECHNOLOGY

CIRCLE 333 ON READER SERVICE CARD

11590 West Bernardo Court/San Diego, CA 92127/Phone (619) 485-8411/Telex: 499-293

APPLE II, IIPUS, IIe, III and Profile are registered trademarks of APPLE Computer Corporation. CP/M is a registered trademark of Digital Research. MS-DOS and MBASIC are trademarks of Microsoft Corporation. Z-80 is trademark of Zilog Corporation. WordStar is a registered trademark of MicroPro International Corporation. SuperCalc is a trademark of Sorcim Corporation. dBASEII is a registered trademark of Ashton-Tate. APPLI-CARD, APPLI-DISC, and 88CARD are trademarks of Personal Computer Products, Inc. IBM is a registered trademark of International Business Machines. All prices, specifications, and promotions subject to change without notice.

and \$5 per hour, and a typesetting service charging \$2 per 1000 characters.

On the no-fee side, General Videotex plans to start a Business Program Library within Delphi that will contain spreadsheet, inventory, and accounting programs, and plans to offer educational tutorials covering a wide range of subjects. Several multiplayer games are under development, including Parsec, adventuring through the galaxy; Time-lords, exploring the fourth dimension; and Scales of the Gods, battling monsters in a medieval fantasy world.

Safecracker, another game under development, promises to be particularly interesting to hackers. Delphi sets up an elaborate security system surrounding an electronic safe. The safe contains an amount of play money. The first sub-

▶ **With the passage of time, Delphi of modern America may become as popular and preeminent as the Delphi of ancient Greece.**

scriber to crack the security system, open the safe, and report the correct amount of play money to Delphi will receive public recognition and \$100 in system time. Safecracker might even keep the hackers out of Department of Defense computers.

An agreeable system with innovative features makes Delphi an appealing telecommunications service. Although it has been in operation for a little over a year and does not contain as many offerings as the more established telecommunications services, Delphi's future looks promising. The system is fun to use. It encourages interaction between subscribers through the Iamwhois service. It treats you like a person, giving you an ID name instead of an ID number. The addition of more services can only increase its allure and usefulness.

Delphi has started out well for a telecommunications newcomer. It offers a good selection of information, communication, and entertainment services. With the passage of time, Delphi of modern America may become as popular and preeminent as the Delphi of ancient Greece. +

When you need competitive prices on Verbatim diskettes, you need SJB Distributors.

SOFTWARE HOUSES:
Blank'n Bulk Available
Call today about our quantity pricing.
Dealer Inquiries Invited.
C.O.D. accepted.
Vsa/MC accepted.



ALSO AVAILABLE
Flip'n File
Printer Ribbons
Library Cases

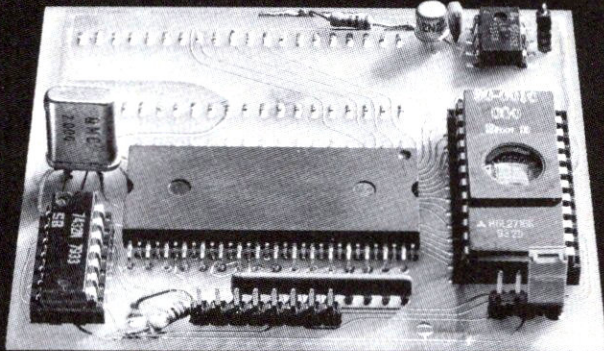
We're SJB. One of the fastest growing distributors in the country. And the reasons are simple. Our prices are competitive and we deliver fast.

SJB DISTRIBUTORS INC.

3524 Dividend Drive/Garland, Texas 75042/800-442-1048 In Texas
800-527-4893

CIRCLE 123 ON READER SERVICE CARD

QUENTIN



QUENTIN! DESIGN WITH THE USER IN MIND...
The feature that Apple forgot.

QUENTIN AP-810 Type Ahead Buffer is a must for every serious Apple IIe user who wants to improve their efficiency. A full 80 character buffer allows you to type at your own speed without waiting for the computer.

QUENTIN AP-810's bottom

line... quiet quality, speed, reliability, and high performance at a reasonable price...QUENTIN!

For more information see your local computer dealer. Or, phone or write Quentín:

Quentín Corporation, 9207 Eton Ave., Chatsworth, CA 91311
(818) 709-6500

Dealer Inquiries Invited.

Quentín is a registered trademark of Quentín Corporation. Apple/Apple IIe are registered trademarks of Apple Computer, Inc.

CIRCLE 120 ON READER SERVICE CARD

ANNOUNCING

A LIBRARY OF SOFTWARE PROGRAMS FOR **APPLE II & IIe** COMPUTERS

A+DISK MAGAZINE

Now you can build a library of programs for your Apple™ at a fraction of the usual cost

Each issue of **A+ Disk Magazine** provides you with up to 10 programs for as little as \$2.00 each.

A+ DISK MAGAZINE is making it easier than ever before to build a library of computer software for your Apple II series microcomputer. Because now you can save 34% on the programs you need to expand the use of your personal computer. Issue after issue, **A+ DISK MAGAZINE** gives you business and

finance aids, utilities, subroutines, games, home and personal applications... all for as little as \$2 per program.

And when you consider that many of today's most popular programs sell for \$50, \$60, \$80 and more, your savings can be *enormous*... much more than the cost of your subscription to **A+ DISK MAGAZINE**.

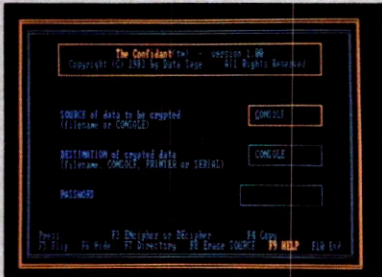
Along with your subscription to **A+ DISK MAGAZINE**, you'll receive



up to 10 thoroughly-tested, ready-to-run programs and files on a floppy disk. Complete with comprehensive, illustrated User Manual, **A+ DISK MAGAZINE** is easy, efficient, and very economical.

Here's just a sampling of what you can expect in every issue:

Programming tools: Create cross-reference listings for your



BASIC programs. Use your text editor on your BASIC programs. Convert data between BASIC and VISICALC® formats.

Business and finance aids: Compute loan payment tables. Calculate the Present Value and Internal Rate of Return for your investments. VISICALC templates for Real Estate, Lease/Purchase and Tax Shelter analysis. Create advanced pie, bar and line chart graphics.

Home/personal applications: Whether you need your own income tax return helper... a personal cash flow analyzer... a speed reading trainer... proven ways to maintain a mailing list... or SAT test preparation aids, **A+ DISK MAGAZINE** has it all.

Utilities and diagnostics: **A+ DISK MAGAZINE** shows you

Personal Finance Consolidated Inquiry		July 11, 1981
8 salary	freelance	125.00
23 interest	interest	750.00
100 food	monthly shopping	88.34
102 rent	monthly rent	570.00
144 insurance	car ins. 1st pay	166.00

how to use your Apple to simulate a conversational terminal with control of disk or printer logging... print graphics, screen images on your printer... backup, copy, delete, un-delete or type files with simple menu commands... plus more.

Data files: From tax tables, to population statistics, from dictionaries to economic times series, **A+ DISK MAGAZINE** involves you as never before.

Games: Adventures! Strategies! Test your skill, intelligence and luck.



The latest software developments at your fingertips for a fraction of the cost.

There's no need to type listings into your computer. With **A+ DISK MAGAZINE**, all you do is boot the disk and go! The accompanying User Manual explains everything in clear, easy-to-understand terms. So you'll be able to run the programs as soon as you receive your first issue of **A+ DISK MAGAZINE**.

Subscribe to A+Disk Magazine and save up to 34%—\$60 off with this Introductory Offer!

A+DISK
MAGAZINE

P.O. Box 2469
Boulder, Colorado 80322

YES Please accept 1 issue 3 issues 6 issues
my subscription for \$2995 for \$69 for \$119
to **A+ DISK MAGAZINE** for: I SAVE \$20.00! I SAVE \$60.00!

Name _____
Address _____ 8H195
City _____ State _____ Zip _____

Check one: Payment enclosed* Bill me

Charge my*: American Express Visa MasterCard

Credit Card No. _____ Exp. Date _____

*10% discount for cash or credit card orders—U.S. only.

MAIL NO-RISK COUPON TODAY—AND SAVE UP TO 34%!

Canadian and foreign orders shipped via Air Printed Matter only; add \$5 per issue and include payment with order in U.S. funds.

Program Submissions

If you wish to submit a program for inclusion in future issues, please write to: **A+ DISK MAGAZINE**, Author Submissions, One Park Avenue, New York, N.Y. 10016.

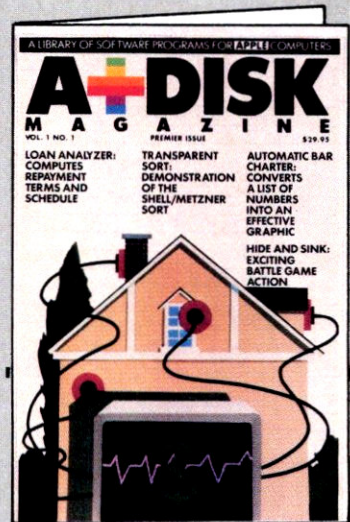
Guarantee

- All programs are fully tested and guaranteed to run. Damaged or faulty disks will be replaced at no charge.
- If you wish to cancel a subscription, simply return the most recent disk in its sealed package and you will receive a full refund for this copy and all unmailed issues.

Product Specifications

Programs will run on Apple II series computers using Apple DOS 3.3 and require a minimum of 48K. Most programs will be written in Applesoft Basic—however some machine language code may be used.

Programs and documentation are copyrighted by Ziff-Davis Publishing Company. All rights of reproduction in all forms and media strictly reserved.



GOLDEN'S APPLES ARE BECOMING DELICIOUS

Morley Golden has a firm grip on his construction company because he has learned to use micros to his advantage.

For six years, Morley Golden, 41, has been running one of San Diego's largest construction companies—not bad for a guy who started as a part-time laborer and has held, as he says, “every job there is to be held” on the operating side of the business. It's not surprising because his firm, M.H. Golden Construction Co., was started by his grandfather in 1927; Morley became chief executive officer when his father retired in 1977.

Morley Golden isn't just another boss's son. To stay at the top of the heap in the rough-and-tumble general contracting business, a company needs something to give it an edge over the competition. For Golden that something is computers. While his company has been changing San Diego's skyline, Golden has been putting together what he and others believe to be one of the best computer “back rooms” in the business.

“We think we've got the most comprehensive system in the industry,” Golden says. “As far as our internal management goes, we use it for everything, literally: estimating, bidding, scheduling, job costing—a total integrated system. A lot of people have components, but very few people have *all* the pieces;

we think we've got all the pieces and are continually refining the system.” Over the years the company has gone through four generations of mainframe computers, beginning with a batch-processing IBM mainframe that has evolved into an interactive, 16-terminal Hewlett-Packard 3000 minicomputer system that Golden installed six years ago. The latest refinement in that evolution is a handful of Apple II personal computers.

Despite Golden's mainframe muscle, it's the Apples, which started out as a novelty for the boss four years ago, that are becoming the workhorses for his \$90-million-a-year general construction concern. With the aid of such off-the-shelf software as VisiCalc (a spreadsheet), DBMaster (a database-management program), Desktop Plan (a financial-planning aid), and similar applications programs, Golden's Apples have mushroomed from Morley's single unit that he used at home occasionally to nearly a dozen machines receiving intensive attention throughout the company's offices and in the homes of its top executives.

For example, M.H. Golden now uses the Apples for budgeting, business projections, mailing lists, and company expense analyses. Combining Apple graphics with numerical tables, Morley developed a unique income-analysis package that has replaced the quarterly job-progress reports called “guesstimates.” It shows him at a glance when one of the company's three dozen projects is out of line. By hooking a modem to the telephone line and using the micro as a terminal, his accountants can now get investment information



from several public database services such as Dow Jones. They're able to call the company's commercial bank to get daily readouts of the firm's bank accounts and the latest money-market conditions. This has improved the company's cash and investment management. Even secretaries, usually not amenable to the idea of using micros for word processing, are creating memos, letters, and internal reports on these little machines.

Different Jobs for the Apple

The mainframe is still the backbone of the firm's important bidding analysis and the huge database that goes with it, but the Apples are continuing to grab important jobs from the larger machines. Recently the Operations Department developed a VisiCalc-based Billing Schedule to track projects on an actual cash-flow basis. Rather than estimate cash outlays in quarterly chunks and then divide each quarterly total during the four months as most construction firms do, Golden's Billing Schedule permits project managers to identify the points where major cash disbursements are made. This improves cash-flow management by showing project managers how much money is needed and when. As with several other projects, this schedule used to be handled on the HP, but it took longer to get less detail—and it required a programmer.

"All of our receivables are monitored on the Apple—not on the 3000," Golden says, as are all of the firm's budget and monthly cash projections.

Why Apples for all of this and not the mainframe? One reason is security. "Somebody has to get his hands on the right 5¼-inch disk to know what I'm thinking," Golden explains. But the real reason, he says, is that the Apple is "convenient and it's friendly."

It's also quick. In one case, Golden recalls, a problem occurred requiring an unusual change in the billing format for one of the company's projects. It was a one-time peculiarity, but to change the format on the mainframe computer would take three weeks and would require a programmer. "We came in on the weekend, and by noon on Saturday had it solved on the Apple."

Golden's Start with Apples

Golden's introduction to personal computing was unusual in several respects. His initial contact with micros was so casual as to be almost frivolous. "About four years ago when personal computers started coming out, I said, more as a lark than anything else, 'Why not?' and bought an Apple." A self-

confessed "gadget freak," Golden looked at the competition but chose Apple on the basis of its versatility, its expandability, and the availability of good software.

He took his new toy home and put it through its paces with various programs such as VisiCalc and Apple Writer and some traditional games. The idea was to see what he could do with the machine; the *last* thing on his mind was business. "I had no intention whatsoever of ever getting it involved in a business application," he says. "That just evolved." Indeed, with a \$500,000 Hewlett-Packard 3000 churning away in the back room and terminals scattered throughout the premises, Golden's little 11-pound, \$2500 Apple II would appear superfluous.

It wasn't long, however, before VisiCalc and Desktop Plan started crowding out Snoggle and Space Warriors; a few months later, Golden put the company's planning budget on the Apple. "I used

▶ The Apples are continuing to grab important jobs from the larger machines.

Desktop Plan to go back and develop a history and do the departmental budgeting for year-end planning," he says. One thing led to another: "I got into bonus distributions and salary analyses and things like that."

His first ambitious project is the cash-flow-analysis package—using Desktop Plan and VisiCalc—that tracks receivables and allows him to spot abnormal income flows for any of the company's three dozen ongoing construction projects. By graphing historical income data with past jobs, he constructs high and low limits in a pair of "banana curves" representing the range of monthly income flowing from any given construction project. If the income of any month falls outside that range, it's a red flag—something is probably wrong. "Either somebody's billing too fast or too slowly, or the job is falling behind schedule or something isn't right," he explains.

Golden feels it's typical of the construction industry to monitor jobs in progress by checking expenses because it's easier to do this by keeping track of subcontractor costs. He believes "the

income side is more indicative of the progress of the job and the overall big picture."

Although he was curious to learn BASIC seven years ago (he and his senior vice-president learned it from the HP-3000 manual and wrote some applications programs for that system), Golden says he has no inclination to delve into the mysteries of computer languages. "I have not wandered off into FORTRAN or COBOL or Pascal or any of the other stuff. I'm quite comfortable in BASIC and I intend to stay with it," he says. "I do not intend to branch out—because I shouldn't be doing it in the first place," he adds, displaying a certain amount of executive guilt.

Paradoxically, most of Golden's programming has been done on the mainframe. In fact there are a number of personal programs on the HP that he's never bothered to transfer to the Apple: a checking-account program, an inventory of his mechanical bank collection, and some football-statistic programs he wrote for his father. (His retired father, a hobbyist statistician, retrieves these programs on the telephone with an Apple that Morley gave him for Christmas.)

He hasn't programmed on the Apple because the need has not arisen. "I have found that between VisiCalc, Desktop Plan, VisiPlot, and ApplePlot—depending on my mood as to which one I want to use—and DBMaster I have solved all of the business problems I have run across without having to go out and author software."

The Company and the Computers

The company now has two Apple IIs in the accounting department. Golden calls them his "Ferraris" because they're "souped up" models, each with an 80-column screen, a Keyboard Enhancer for uppercase and lowercase letters, and a Z80 SoftCard, which converts the Apple to run CP/M-based software. The firm also has one each in the Operations and Marketing departments and one in Golden's office area, where it is accessible to other senior VPs. In addition, five of the company's senior execs now have their own micros at home—all Apple IIs except for a lone Osborne portable.

How much time does the boss spend on his micro? "Are you asking me, or are you asking my wife?" he responds, betraying a certain sensitivity common in personal-computing circles. Golden says he works on the Apple in "fits and starts." It might be as little as three hours in four weeks "but I have also gone for four weeks and spent three

System Saver® didn't become the Apple's number one selling* peripheral by being just a fan.

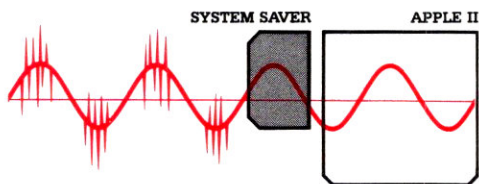
What made over 100,000 Apple® owners fall in love with System Saver? The answer is simple. It's the most versatile, most convenient, most useful peripheral ever made for the Apple.

System Saver filters out damaging AC line noise and power surges.

70-90% of all microcomputer malfunctions can be traced to power line problems.** Problems your System Saver guards against.

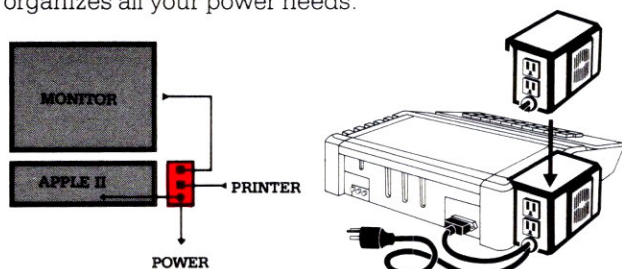
Power line noise can often be interpreted as data. This confuses your computer and produces system errors. Power surges and spikes can cause severe damage to your Apple's delicate circuitry and lead to costly servicing.

System Saver clips surges and spikes at a 130 Volts RMS/175 Volts dc level. A PI type filter attenuates common and transverse mode noise by a minimum of 30 dB from 600 kHz to 20 mHz with a maximum attenuation of 50 dB. You end up with an Apple that's more accurate, more efficient and more reliable.



System Saver makes your Apple more convenient to use.

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.

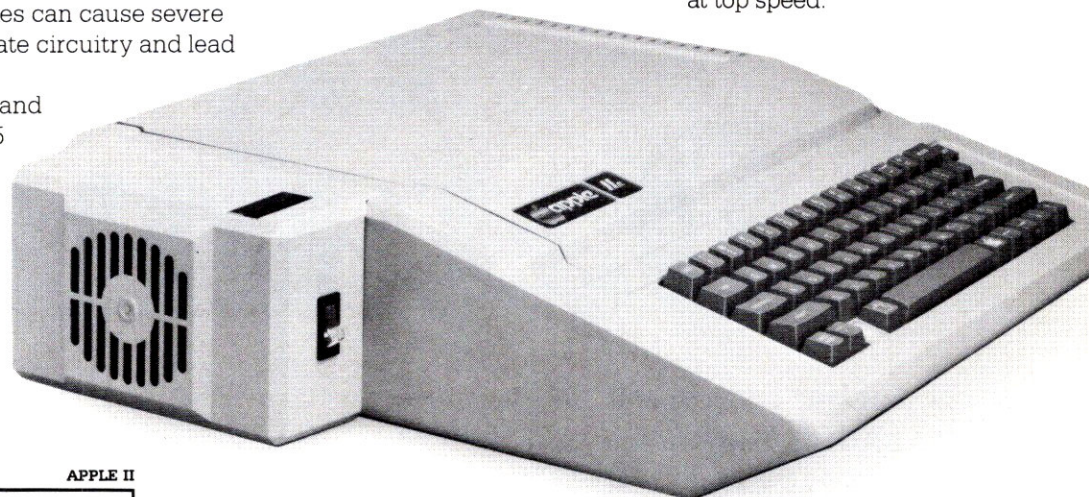
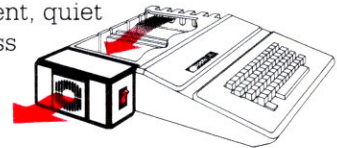


It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

System Saver lets your Apple keep its cool.

Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.



So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

Compatible with Apple stand



\$89.95 at Apple dealers everywhere.

**K KENSINGTON
MICROWARE**

251 Park Avenue South, New York, NY 10010
(212) 475-5200 Telex: 467383 KML NY

*Softsel Computer Products Hot List. **PC Magazine, March 1983.

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

System Saver is a registered trademark of Kensington Microware Ltd. © 1983 Kensington Microware Ltd. System Saver is patent pending.

IBM PC APPLE II^E EAGLE PC COMPAQ COLUMBIA AND MORE

Data- Matched By Datamac

Introducing Datamac's Trustor Information Modules. Hard Disk Mass Storage For More Micros.

Today, more serious users of micro-computer power need more storage than ever before. Because for those to whom a micro means business, mass storage means more of it.

But the mass-storage choices have been somewhat less than satisfactory. Because most are built for "just this" or "just that" micro.

Now, with Datamac's Trustor Information Modules—in 10-megabyte, 30-megabyte, and 30-megabyte plus tape back-up versions—the choice is clear. And it's impressive. Smart-looking and space-saving, Trustor Information Modules are data-matched to a full range of today's most popular micros, not just one. The IBM PC. The Apple II and II^E. The Eagle PC. The Compaq. The Columbia. With more being added to all the time.

But there's also an inside story where data-matching is just as important. Trustor Information Modules utilize top-quality components designed

and tested *as a system*, not as a coincidental collection of drives, controllers, and power supplies.

Trustor Information Modules are more reliable, more cost effective, and just plain more sensible mass-

storage solutions. For the dealer, because more compatibility means fewer storage peripherals that have to be kept in stock. And for the user, because more compatibility means more convenience in getting on-line—and more

versatility in getting something that isn't obsoleted as needs change and expand.

Get data-matched today. Pick up the phone and call Marketing Services at (408) 720-0800.

**DEALER
OPPORTUNITIES
AVAILABLE.**



DATAMAC

432 Lakeside Drive
Sunnyvale, CA 94086
(408) 720-0800

CIRCLE 112 ON READER SERVICE CARD

company's headquarters. He states that "other than those trained in computer programming, the mainframe doesn't lend itself to people trying to become knowledgeable about learning how to program or do anything on it. It seems like it's only for the sophisticated, or at least it has that connotation; with the in-house system you have to know sophisticated programming languages, and you can't really sit down and do the quick and dirty kinds of things [that you can do on the Apple]. Somehow the Apple is less foreboding or doesn't seem as com-

plex, and people are attracted to it in the sense of saying, 'Maybe I'll sit down and try and learn some of this BASIC programming.'"

There are redundancies in the two systems, he says, "but each has its own place. We use the mainframe for number crunching, for its database, and for processing payroll checks, but [the Apples] satisfy a real need for a workstation with personal acceptance." Compared with the Hewlett-Packard, an Apple II is seen as a forgiving, approachable machine "where you don't have the fear that if

you push the wrong button the machine will spit punched tape all over the place."

Flourishing Micros

If there is a single key to M.H. Golden's success with computing in all forms, it's the positive attitude toward data processing that pervades the company, the feeling that data processing *isn't* just a necessary evil, isn't something that you did because you *had* to. "We all wanted to make data processing work," Golden says. "We trust it."

In the same vein, the use of personal computers has been supported and spontaneous. "Nothing has ever been forced by management edict," Morley explains.

In the end it is the boss, of course, who sets the tone for the entire organization, and in that sense Morley Golden has created the perfect atmosphere for micros to flourish. "He's a real proponent, and that helps," says Todd. "He's enthusiastic about it, and that can't help but filter down. And when you see him using [the Apple] on a Saturday morning and see that the output and benefit he's

Because our new Micro Cookbook makes it easier than ever for you to bake, broil, roast and fry 'em.



Not only by giving you more than 150 recipes—which it does. But by simplifying the whole art of cooking. You see, Micro Cookbook eliminates messy, confusing recipe files. Instead you simply insert our program into your computer and select any recipe your heart, or stomach, desires. Ask for a recipe by name, ingredients or category.

The recipe you select can be one of the mouth-watering dishes we include—or you can create a diskette of your own favorites. And you can constantly modify your selections, adding new triumphs and removing recipes that, ah, bomb.

These, and Micro Cookbook's other features, will make your life in the kitchen a breeze.

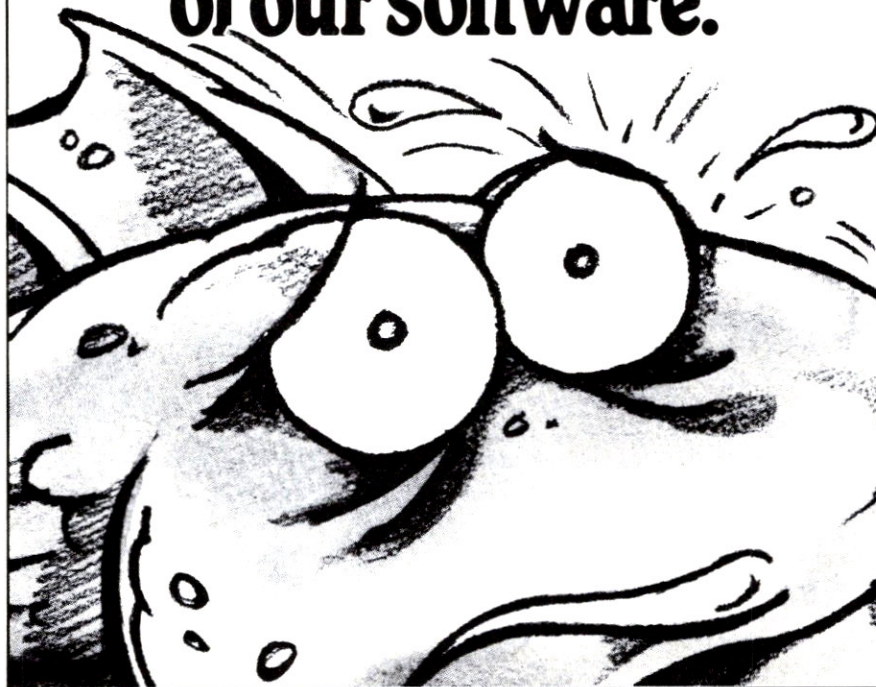
With this in mind, is it any wonder Micro Cookbook makes this guy so nervous?

Versions available for Apple II+, IIe (80 col) and IBM PC (64K, PC DOS). The cost \$40. Advanced Functions Package (requires Micro Cookbook) for IBM PC (128K, PC DOS or MS DOS) and Apple II+, IIe (64K, 80 col). The cost \$30. Soups & Salads, Appetizers, or Dessert options, \$12 each. Check your dealer first. MC VISA check, phone or mail order accepted. Please specify computer and add \$2 handling.
APPLE, IBM and MS DOS are registered trademarks of Apple Computer, Inc., IBM Corporation, and Microsoft, Inc., respectively.

VIRTUAL COMBINATICS

P.O. Box 755, Rockport, MA 01966
(617) 546-6553

Why fish are terrified of our software.



CIRCLE 296 ON READER SERVICE CARD

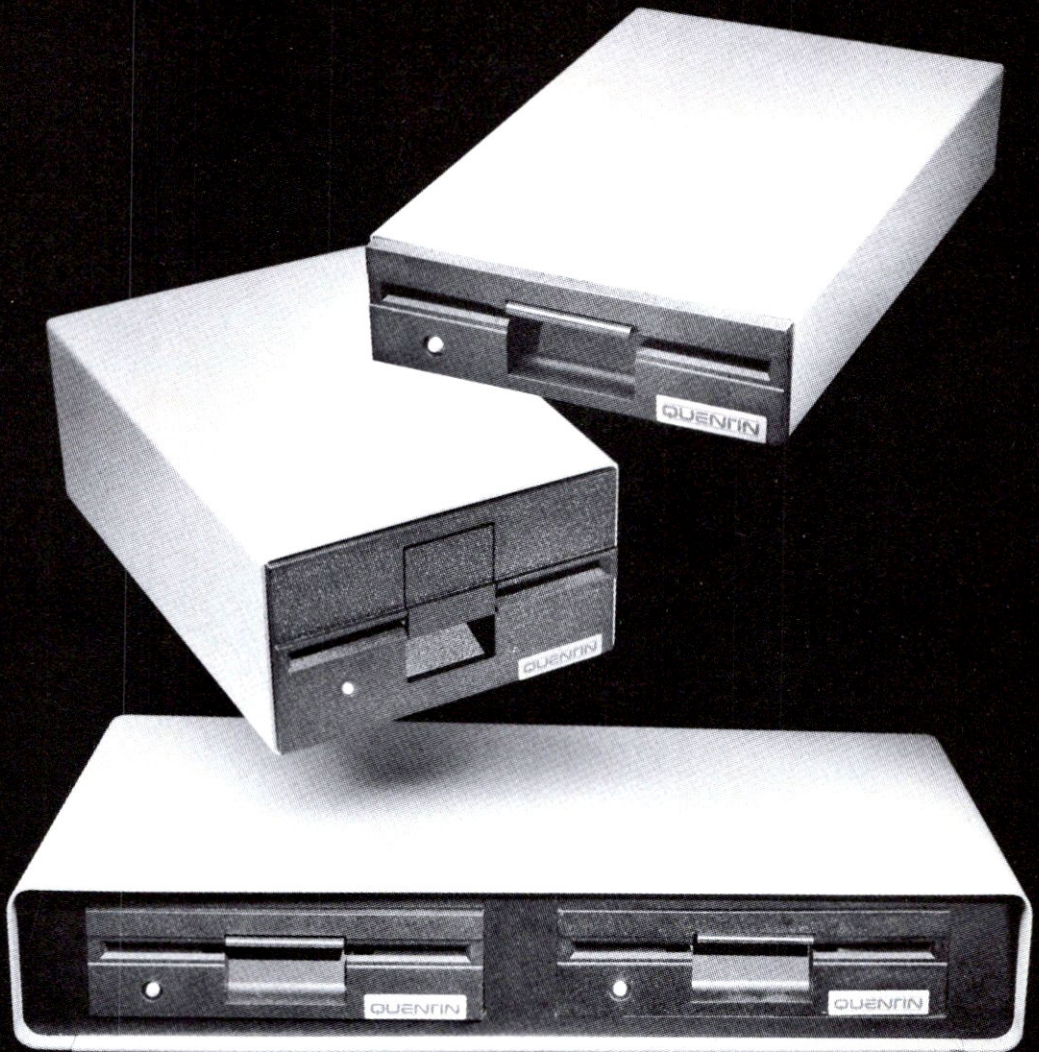
An Apple II is seen as a forgiving, approachable machine.

getting out of it has a justification, then you take the next step and say, 'How could that help me in what I'm doing?'

Todd elaborates on that: "Different people are finding applications that they're doing in their particular areas that they feel could be done more effectively and efficiently on a machine—everything from investment analysis at home to statements of bidding, job budgeting, or job control. We have several project managers who are using the cash-flow/cash-projection routines to manage and control the jobs they are working on, and a lot of people are using them for quasi-personal uses—not the check-book-balancing kinds of things—but doing a budget or an analysis of a particular investment opportunity or the sale or refinance of a home."

Meanwhile Golden's people continue to siphon projects from the mainframe into their Golden Apples. "We're still trying to evaluate when we cross over the line and abandon the big system," Todd says. "We haven't gotten to that point yet—but we're thinking about it." +

QUENTIN



QUENTIN! DESIGN WITH THE USER IN MIND...

Quiet Quality, Reliability, Value...Compatibility

QUENTIN'S 5-1/4" Floppy Disk Drive AP series (AP-100, AP-105, and AP-110) are all designed specifically for the **Apple** and **Franklin** user. Each unit is 100% compatible with the Apple II, IIe, and Franklin 1000 series.

QUENTIN gives you 14% more storage capacity and is fast, quiet, and reliable.

QUENTIN gives you a choice. You can use the full height unit, AP-100, that gives you a 50% faster seek rate than the

comparable Apple unit. Or, you can opt for the Slim Line AP-105 that has even more speed in less space.

QUENTIN'S AP-110 Twin Slim Line gives you two drive capability and it fits conveniently on the computer to save even more space.

QUENTIN'S AP series bottom line... quiet quality, speed, reliability, and high performance at a reasonable price... QUENTIN!

For more information see your local computer dealer. Or, phone or write Quentín:

Quentin Corporation, 9207 Eton Avenue, Chatsworth, California 91311 / (818) 709-6500

Dealer Inquiries Invited.

Quentin is a registered trademark of Quentin Corporation. / Apple II/Apple IIe are registered trademarks of Apple Computer, Inc. / Franklin is a registered trademark of Franklin Computer Corporation.

CIRCLE 118 ON READER SERVICE CARD

NOW YOUR APPLE® CAN HOOK TO ANY MAINFRAME.

Apple is a registered trademark of Apple Computer, Inc., CP/M is a registered trademark of Digital Research, Inc., Dow Jones News/Retrieval is a registered trademark of Dow Jones, Inc. The Source is a service mark of Source Telecomputing Corporation, CompuServe is a registered trademark of CompuServe, Inc.



If you have an Apple II, Apple II Plus, or Apple IIe, we have good news for you. Now there are two inexpensive software programs that can turn your Apple into a much more valuable tool.

Softerm 1 connects you with information services.

Softerm 1 lets you retrieve information from services such as *The Source*,sm *CompuServe*[®], and *Dow Jones News/Retrieval*[®]. Plus, gives you the ability to access bulletin boards and send or receive electronic mail. Other features include user-defined keyboard macros, built-in phone book for automatic dialing, terminal mode line capture simultaneously to print or disk, copy screen to print or disk, and terminal status display.

Softerm 2 connects you with your company's computer.

This expanded version of Softerm lets you gain access to the information stored in your company's main computer from your home or office. With either version of Softerm, you can download information into your Apple and capture it on your own disk

in any format you choose—DOS, CP/M[®], or Pascal. Also included with Softerm is a source program for your host computer to ensure compatibility with Softerm's file transfer capabilities.

Makes your Apple work exactly like any major terminal.

Softerm 2 provides complete emulation of these terminals: ADDS Regent 20, 25, 40, 60; ADDS Viewpoint; Data General D200; Datapoint 3601; DEC VT102, VT52; Hazeltine 1400, 1410, 1500, 1520; Hewlett-Packard 2622A; Honeywell VIP7205; VIP7801, VIP7803; IBM 3101 Model 10 and 20; Lear Siegler ADM-3A, ADM-5 and TeleVideo 910, 925, 950. And the list is growing all the time. We'll send you a User's Guide, handy reference card, and a telephone number to call if you need more assistance.

CIRCLE 163 ON READER SERVICE CARD

Softerm can't become obsolete.

We constantly improve Softerm. And we make those improvements available to you 24 hours a day, 7 days a week. To update your program, just dial our computer and transfer the improvements to your disk.

Get Softerm now.

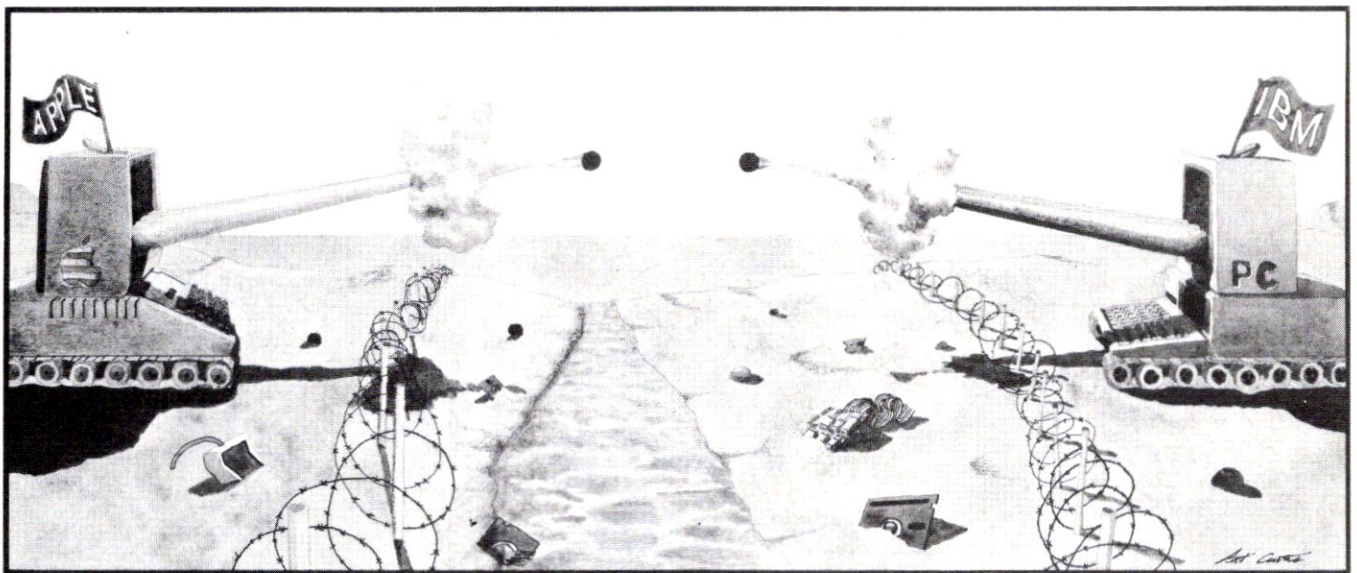
It's the inexpensive way to turn your Apple into a much more valuable tool for your home or office. Softerm 1 is only \$135; Softerm 2 is \$195. Both are available now from your local dealer or from Softronic, Inc. For more information or to order, call (901) 683-6850.

SOFTRONICS

3639 New Getwell Road, Suite 10
Memphis, TN 38118. (901) 683-6850

ELECTRONIC BRAINSTORMING BY JOHN UNGER ZUSSMAN

IBM sells personal computers;
Apple uses them.



THE APPLE/IBM DIFFERENCE

A war's going on between Apple and IBM, and it's not just a war of competing products. It's a war of competing approaches, styles, and philosophies. The outcome may well determine the type of computers we'll be using ten years from now—and how we'll buy them and how much they'll cost.

The differences between the two companies are apparent as soon as you enter their respective corporate offices. At Apple's headquarters in Cupertino, California, there's an Apple—sometimes two—on every desk. In addition, all employees get an Apple to take home on indefinite loan. Once employees have been with the company for a year, the Apple is theirs to keep.

Conditions are different at IBM's Entry Systems division in Boca Raton, Florida, where the Personal Computer is made. As *InfoWorld* columnist Doug

Clapp recently observed, Apple managers have computers; IBM managers have secretaries. The secretaries, in turn, have Selectric typewriters, not PCs. "I don't believe that small computers are as pervasive, or as effective,

**To IBM,
personal computing
is a business.
To Apple,
it's a passion.**

at IBM as they are at Apple," commented Clapp.

It's a long-standing tradition in the microcomputer industry for the cobbler's kids to go barefoot. Since start-up companies typically have little money,

any equipment generally goes to the technical staff. Managers and clerks make do with manual systems—an arrangement that often continues, through sheer inertia, well past the early financial crises.

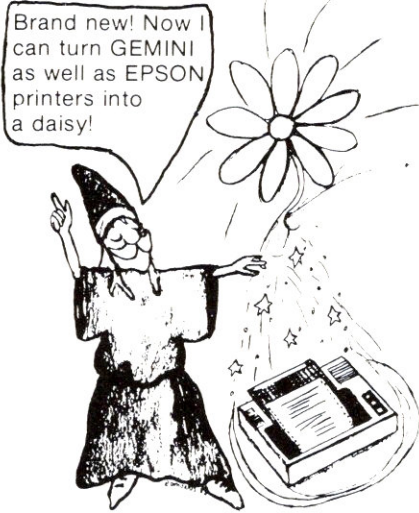
Still, IBM is hardly a start-up. It's difficult to believe the company couldn't put a PC on every employee's desk if it wanted to. The fact is, even at Entry Systems, IBMers seem more oriented toward *selling* personal computers than toward *using* them. They work *on* micros; Apple people work *with* them. To IBM, personal computing is a business. To Apple, it's a passion; the business aspect is almost a sideline.

How Did We Get into This Mess?

Both companies entered the personal-computer business reluctantly, though they came from vastly different directions. Apple founders Steve Jobs

TURN DOT MATRIX INTO A DAISY . . .

Brand new! Now I can turn GEMINI as well as EPSON printers into a daisy!



with the **NicePrint Card** (formerly SUPER-MX Card) for the **Apple II, II+, or IIe**.

The standard of printing excellence is the daisy-wheel printer. The **NicePrint** interface card improves EPSON or GEMINI printers so they have just about the same quality print as the daisy-wheels! And this high quality is easily available to all Apple software, even copy-protected diskettes.

Here is a sample of dot matrix printing. **Change it into a daisy with NicePrint!**

Four optional font styles are available in addition to the standard Roman font shown above that simply plug into the card:

LETTER GOTHIC is modern looking.
ORATOR is easy to read and good for speeches.
SCRIPT adds the personal touch.
OLDE ENGLISH is very formal and elegant.

BETTER THAN GRAPPLER!

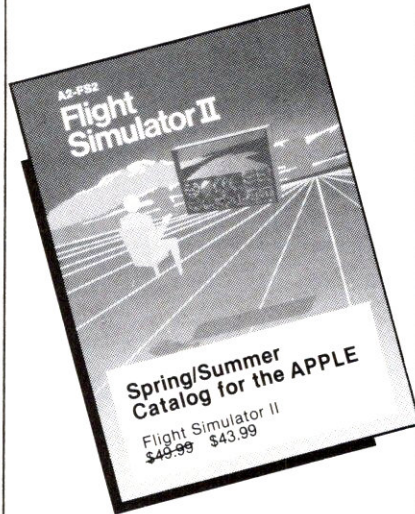
The **NicePrint** card has all the Apple Hi-Res graphic dump commands that the Grappler has including: double dumps (both pages side by side), dump from page 1 or 2, double size, emphasized, rotated, strip chart recorder mode, and text screen dump.

Spies Laboratories

(pronounced "speez")
 P.O. Box 336
 Lawndale, CA 90260
 (213) 644-0056

Apple II is a TM of Apple Computer, Inc.
 Grappler is a TM of Orange Micro, Inc.

CIRCLE 238 ON READER SERVICE CARD



Fly into Spring With Strictly Soft Ware

Send for free catalog today.

Strictly Soft Ware 1-614-587-2938

To receive your free catalog right away, send this coupon to the address below. Do you want our Apple or IBM Catalog?

NAME _____

STREET _____

CITY _____

STATE _____

ZIP _____

()
 PHONE _____

Strictly Soft Ware
 P.O. Box 338
 Granville, OH 43023



A+

CIRCLE 365 ON READER SERVICE CARD

and Steve Wozniak built their first computer, in that legendary garage, for their own amusement. They were surprised when their friends and fellow tinkerers also wanted computers; but, finally convinced, they set out to build a computer that others could use. The result, the venerable Apple II, still sells strongly going into its eighth year, in an industry where a five-year product life span is enviable.

IBM initially spurned the micro market, clinging to its mainframe and minicomputer product lines until it could no longer deny the reality of the personal-computer revolution. Ironically, the success of products such as Apple II compelled IBM to take notice. Once persuaded, IBM devoted its efficient, methodical, calculated approach—and its abundant resources—to developing a personal computer.

The result, the IBM PC, is a masterpiece of market and industry positioning, more than of technological sophistication. In fact, its engineering is notably conservative. The PC used mature, tried-and-true technology that other companies had already surpassed. But the PC matched precisely the needs of its intended market—corporate managers and operators of small businesses.

Moreover, for the first time in IBM's history, the engineering was open. IBM included five expansion slots in the PC and published detailed technical specifications. Independent companies had no trouble developing PC-compatible hardware and software.

It's significant that IBM's technology has consistently lagged behind that of these third-party vendors. For example, the independents offered double-sided disk drives, hard disks, and color monitors for the PC long before they were available from IBM. Similarly, within three weeks of IBM's announcement of the PCjr, two companies announced enhanced PCjr keyboards.

What IBM has built is less a computer than a bandwagon. It has made up for its late entry by actively fostering a market movement. In other words, IBM engineers have developed products that others want to use.

Apple engineers, in contrast, have developed products *they* want to use. They've relied on being brilliant—which is both Apple's great strength and its great weakness. Apple's major products to date—the Apple II, the Lisa, and the Macintosh—are bold, innovative, and technically advanced, almost experimental.

Apple's engineers, trusting their own instincts, have occasionally guessed wrong. For example, Apple made several efforts to develop its own disk drives for the Lisa and the Macintosh. It finally abandoned the project and customized a Sony drive instead.

Most often, Apple's instincts have been right on target, though. That's why the Apple II has lasted so long and why the Lisa and the Macintosh have received so much acclaim. It's instructive that the Apple III—the only product Apple designed for others—is its least successful product.

Apple, designing for itself, tries to find its own engineering solutions to all foreseeable problems. For example, it has actively developed its own proprietary operating systems, starting with Apple DOS for the Apple II. Even when Apple supported industry-standard system options, such as UNIX on Lisa, it published a long list of suggested programming rules for interaction between programs and users.

Brilliant vs. Smart

While Apple was busy being brilliant, IBM was busy being smart. IBM initially offered three standard operating systems (MS-DOS, CP/M, and the p-System) and recently announced a fourth (UNIX). IBM lets the market make the choices and the improvements.

Here is another example. Apple has tried to maintain absolute control over its computers. It has curtailed mail-order distribution channels, patented its technology, and actively prosecuted manufacturers of Apple-compatible machines. So far, IBM has taken no action against the PC-compatibles. In fact, by registering no patents and publishing its specifications, IBM has encouraged imitation.

These actions have made Apple somewhat of an innovative loner, an image the company is promoting in its recent advertising campaigns. In one TV commercial, an Apple user is working alone in a cavernous room ahead of (but also isolated from) a crowded roomful of other computer users. In another ad, a manager has clearly spent all night at the office, working alone with his Lisa computer. He calls home with an exhausted smile to report he'll be back for breakfast.

Apple obviously wants to appeal to people who fit its corporate image— young (baby-boom generation), innovative, and independent. Apple users, the ads suggest, are loners too—they demand brilliance and aren't content to

ANNOUNCING creative computing's 1984 BUYER'S GUIDE

TO PERSONAL
COMPUTERS &
PERIPHERALS



Advice you can trust on selecting personal computers, peripherals and electronic games

Unless you have the memory of a computer there's no way you can keep track of all the games, programs and peripherals available for your computer. And even if you could, you'd still have a problem figuring out what's best for your needs and how to get the most for your money.

That's why you need the 1984 Buyer's Guide to Personal Computers & Peripherals. It's a comprehensive collection of product reviews and consumer-oriented shopping advice put together by the experts at *Creative Computing* magazine.

You'll get a rundown of what's new on the market. Analysis of new product performance, reliability, operation, applications, cost—even what kind of repair service you can expect. Easy-to-understand comparisons between different models. Tips on bugs and design problems. Plus "inside" information you won't get from manuals or salespeople.

Don't buy until you've consulted the 1984 Buyer's Guide to Personal Computers & Peripherals! Order your copy today.

Send to: NQ2C
Creative Computing Buyer's Guide
CN 1914, Morristown, NJ 07960

YES! Please rush me Creative Computing's 1984 Buyer's Guide to Personal Computers & Peripherals. Enclosed is my check or money order for \$3.95 plus \$1 for postage and handling.

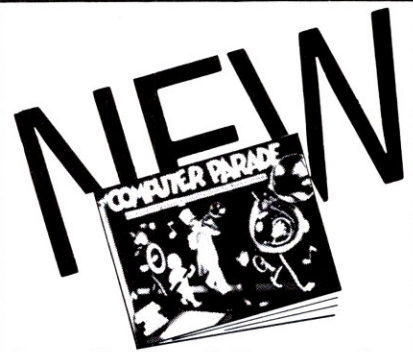
Mr./Mrs./Ms. _____
(please print)

Address _____

City _____

State _____ Zip _____

Please make check payable to Creative Computing Buyer's Guide. CA, NJ and NY State residents please add applicable sales tax. Price outside U.S.A. is \$6.



Let Colonel Byte take your child on a trip through Cybernia

*They'll learn all about
computers along the way!*

Growing up in the computer world will be easier if your child understands computers. And there's no better place to start than with the computer that's in your home—and with the help of this delightful book.

Computer Parade reads like a story book. Yet it actually teaches the basics of computer operation.

Computer Parade traces the adventures of Katie and her brother after they fall into the family computer. Once inside the computer, they find themselves in the imaginary land of Cybernia where they meet Colonel Byte. Colonel Byte takes them to a computer parade, where they learn how computer music is made. All along their fanciful journey, the threesome encounters friendly and ferocious dragons, computer bits, eeks and aaks. And of course they're always on the lookout for program bugs.

Any youngster age 4-10 will delight in *Computer Parade*. It's easy to read and richly illustrated in full color.

Help your child grow up computer literate by ordering your copies now.

MAIL TODAY TO:
CREATIVE COMPUTING PRESS
Dept. NQ3C 39 East Hanover Avenue,
Morris Plains, NJ 07950

Please send me _____ copies of *Computer Parade* for \$9.95 each, plus \$2.00 shipping & handling per book.

Total Amount \$ _____ 9P

Payment Enclosed. (CA, NJ and NY State residents please add applicable sales tax.)

Charge my:
 American Express MasterCard Visa

Card # _____ Exp. _____

Signature _____

NAME _____
(please print)

ADDRESS _____

CITY _____

STATE _____ ZIP _____

*Outside U.S., add \$3 for shipping and handling.

Check here to receive a FREE catalog of computing books, magazines and guides.

Also available in your local bookstore or computer store.

**For Faster Service,
PHONE TOLL FREE: 800-631-8112**

(In NJ only: 201-540-0445)

use technology that isn't thoroughly up to date.

But brilliance isn't always smart. Consultants Barbara and John McMullen recently observed computer stores that carried both the Lisa and the PC. "Invariably there is a much larger crowd around Lisas than around PCs," they reported, "yet the stores always sell more PCs than Lisas."

Apple has recently shown encouraging signs that it is conscious of industry standards. It has dropped the price of the Lisa dramatically, increased its emphasis of UNIX on the Lisa, and announced support for Rana Systems' innovative new 8086/2, which gives IBM PC compatibility to the Apple. These decisions may not be brilliant, but they are smart.

Take the Rana expansion option, for example. It contains an Intel 8086 co-processor, 256K bytes of memory, and two floppy-disk drives. All together, they allow an Apple II or IIE to run MS-DOS, the most popular PC operating system. Shortly after Apple blessed the 8086/2, Lotus Development Corporation announced a version of its integrated application program, 1-2-3—by far the best-selling PC software package—to run on Apples equipped with

the Rana option. Score one for Apple.

The Macintosh, on the other hand, is unabashedly brilliant, even revolutionary. It's also built from the ground up and ignores virtually every established standard in the business; no color, no cursor keys, no expansion slots, small disk drive, yet another proprietary operating system. "Who cares?" asks Ap-

We need an Apple that's both brilliant and smart to keep IBM from dominating the industry and slowing the pace.

ple. "These are the standards that have alienated millions of potential computer users." A good point.

Apple means to set a whole new standard, to steal the standard-setting business away from the IBM PC (which stole it, in turn, from the Apple II). Is this brilliant? Of course. Is it smart? I don't know. It's risky. If it

works, it's smart.

Last year, every software company I knew of had boarded the IBM bandwagon. All my programmer friends were working feverishly at their PCs, leaving their dusty Apples in the corner. Even software developers such as Mitch Kapor (Lotus), Dan Bricklin (Software Arts), and Fred Gibbons (Software Publishing), who'd made their first million on the Apple, seemed intent on making their second on the IBM.

Now they're writing for the Macintosh. But they've still got one hand on their PC.

In the mainframe world, a long-standing joke had it that the market consisted of Snow White (IBM) and the seven dwarfs (Burroughs, Honeywell, NCR, Univac, RCA, General Electric, and Control Data). (This was an old joke—way before Apple, even before DEC.) If Apple abandons its brilliance and becomes merely smart, it will surely be destined for dwarfdom.

Conversely, should Apple continue to be brilliant but not smart, it might not survive at all. That would be a shame. We need an Apple that's both brilliant and smart to keep IBM from dominating the industry and slowing the pace. **+**

New DAVID-DOS II™ Compared With Other DOS's

Now you can speedup Text-file handling two ways

DAVID-DOS II is a new edition of DAVID-DOS with added speed, commands, and features. New Read, Write and Save routines are high speed. DAVID-DOS II updates full disks like Apple's Master Create. (The programs on your disks are not touched). DAVID-DOS II Inits blank disks with Basic, Binary or Exec HELLO in seconds. Ten new commands operate identical to existing DOS commands. Use them from the keyboard or in Basic programs. They accept A & L parameters.

Ten New DOS Commands

1. TLOAD speed loads all Text Files, random or sequential, to ram.
2. TSAVE speed saves all Text Files, random or sequential, from ram.
3. TLIST Lists all Text Files, random or sequential to screen/printer.
4. DUMP Memory to screen/printer in Hex with Ascii on right side.
5. DISA disassembles Binary to screen or printer.
6. AL prints last loaded program Address & Length in decimal & hex.
7. HIDOS moves DOS to Language Card & continues operation of program.
8. / is a one keystroke Catalog in addition to the original command.
9. DATE prints with any clock. Also File Dating with clock or manual.
10. FIND prints address's of hex found in 64k memory. Hidos cmd only.

Compatible

All DOS entry addresses have been preserved. DOS is original length and compatible with most software. David-Dos II is copyable and creates fully copyable updated disks. DAVID-DOS II is licensed by programmers for inclusion in the software they sell. Init areas were used for David-Dos II. Works with all Apple IIs including IIE80 Col, Franklin & Hard Disks, such as Corvus & Xebec. Requires 48K. Complete documentation for screen or printing and many utilities are on the disk.

All times in seconds (Time Test programs available)		DAVID DOS-II	ProDOS	DIVERSI DOS	DOS 3.3
TEXTFILES (100 Sectors) (791 Strings, 32 chars ea)	TSAVE	8.0	NO	NO	NO
	TLOAD	6.2	NO	NO	NO
	WRITE	29.3	28.0	29.4	88.4
	READ	24.3	16.3	24.3	83.8
	PRINT/READ	44.2	45.9	45.1	117.1
(442 Sectors, 7 x 500)	APPEND	142.3	142.9	151.1	1231.2
APPLESOFT (100 Sectors)	*SAVE	7.1	16.4	6.4	33.1
	LOAD	5.0	4.0	5.0	23.5
INTEGER (100 Sectors)	*SAVE	7.3	NO	6.6	33.4
	LOAD	4.9	NO	4.9	23.4
BINARY (100 Sectors)	*BSAVE	7.8	18.4	7.3	28.7
	BLOAD	5.8	4.8	5.8	24.5
48K PROGRAM SPACE (With 3 Bufs avail)	APPLESOFT	36.352	NO	36.352	36.352
	INTEGER	36.352	NO	36.352	36.352
	BINARY	36.352	34.816	36.352	36.352
64K PROGRAM SPACE (With 5 Bufs avail)	APPLESOFT	46.592	31.232	45.658	35.162
	INTEGER	46.592	NO	35.162	35.162
	BINARY	46.592	40.704	45.658	35.162
NUMBER OF DOS COMMANDS		37	29	31	28
CLOCK FILE DATING		YES	YES	NO	NO
MANUAL FILE DATING		YES	NO	NO	NO
ONE KEYSTROKE CATALOG		YES	NO	YES	NO
AUTO USE INTEGER CARD ANY SLOT		YES	NO	NO	NO

Each Program was tested twice W/Apple Clock Card on a newly formatted disk containing DOS.
*Add 5 seconds for Verify. Apple II, Applesoft & ProDOS are trademarks of Apple Computer

To Order: Send Check or Phone Visa/MasterCard.
Add \$2.00 Shipping. Overseas add US \$4.00
Calif. add 6%. All orders airmailed.

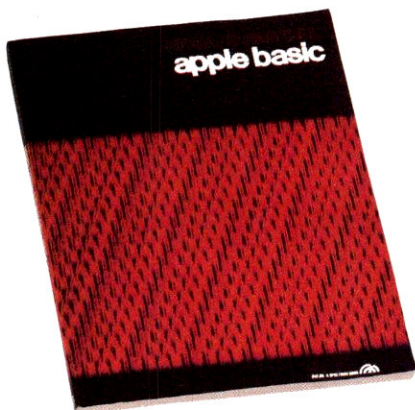
\$39.95

DAVID DATA

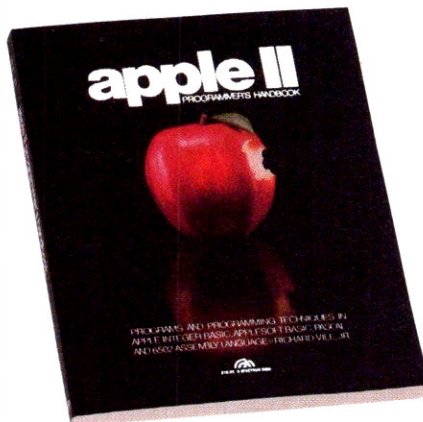
12021 WILSHIRE BLVD., SUITE 212H
LOS ANGELES, CA 90025 (213) 478-7865

CIRCLE 385 ON READER SERVICE CARD

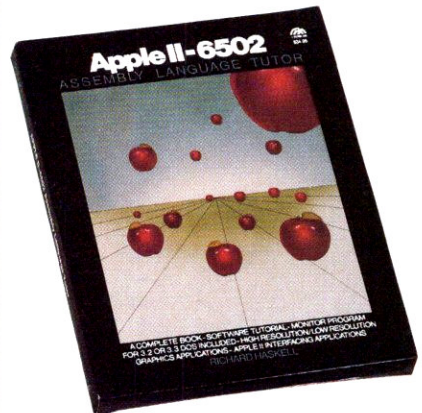
Prentice-Hall speaks a language other publishers have forgotten. English.*



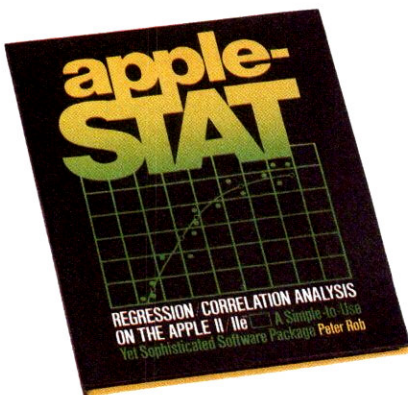
APPLE BASIC by Richard Haskell. A step-by-step, illustrated intro that shows how to write programs for financial management, graphics, games, math problems, and more. \$12.95



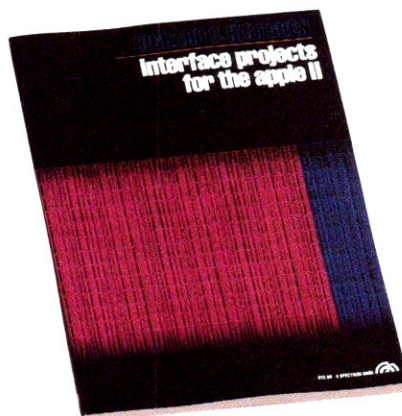
APPLE II PROGRAMMER'S HANDBOOK by Richard Vile, Jr. Teaches four most common Apple programming languages: Integer BASIC, Applesoft BASIC, Apple (UCSD), Pascal, and 6502 Assembly Language. Plenty of applications. For intermediate programmers. \$16.95



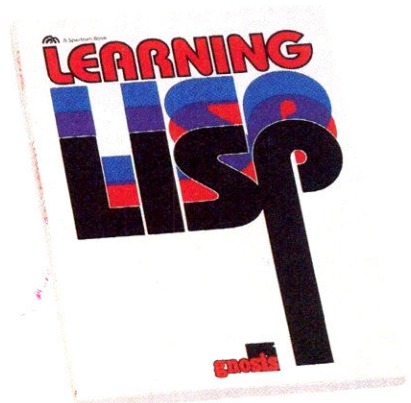
APPLE II-6502 ASSEMBLY LANGUAGE TUTOR by Richard Haskell. A specially designed book/disk tutorial that makes it easy to learn assembly language programming and interfacing techniques. \$34.95



APPLESTAT: Regression/Correlation Programs for the Apple II/IIe by Peter Rob. Easy-to-use, yet sophisticated statistical management system in book/disk package. Includes convenient HELP feature. \$49.95



INTERFACE PROJECTS FOR THE APPLE II by Richard C. Hallgren. Hardware-oriented projects that are easy to build, and enable users to discover Apple II's vast capabilities. \$12.95



LEARNING LISP by Gnosis. An intro to the much talked-about language of artificial intelligence. Packed with examples and exercises. Disk available. \$14.95

PRENTICE-HALL/THE LEADER IN COMPUTER PUBLISHING

For more information about our computer books and software, write to us at the address below. Dealer inquiries welcome.
Prentice-Hall, General Publishing Division, Englewood Cliffs, N.J. 07632

*We guarantee that all our guides are easy to read and simple to apply without the aid of a reference library, a computer salesperson, or a niece who just graduated from M.I.T.

CIRCLE 104 ON READER SERVICE CARD



No Hidden Charges
No Charge for Credit Cards
No Shipping Delay for Personal Checks

SAVE!

ATARISOFT
 Centipede \$28.00
 Defender \$28.00
 Pac-Man \$28.00
 Robotron 2084 28.00

AVALON HILL
 T.A.C. \$28.00
 Telengard 28.00

AVANT-GARDE CREATIONS
 Computer Golf 2 \$25.00

BEAGLE BROTHERS
 Alpha Plot \$28.00
 Apple Mechanic 21.00
 Beagle Bag 21.00
 Beagle Basic 28.00
 DOS Boss 20.00
 Double Take 25.00
 Flex Text/Type 21.00
 Frame Up 21.00
 Pronto DOS 21.00
 Tip Disk #1 15.00
 Typefaces 15.00
 Utility City 21.00

BLUE CHIP
 Baron \$42.00
 Millionaire 42.00
 Tycoon 42.00

BRODERBUND
 A.E. \$25.00
 Bank Street Writer 48.00
 Choplifter 25.00
 Drol 25.00
 Gumball 21.00
 Lode Runner 25.00
 Spare Change 25.00

CALIFORNIA PACIFIC
 Ultima/Akalabeth \$25.00

CBS SOFTWARE
 Goren: Learning Bridge
 Made Easy \$56.00
 Mastering the SAT 105.00
 Mystery Master 25.00
 Success With Math ea. 20.00

DATAMOST
 Aztec \$28.00
 Bilestoad 28.00
 Casino 28.00
 Swashbuckler 25.00
 Thief 21.00

DATASOFT
 Zaxxon \$28.00

DECISION SUPPORT
 The Accountant \$99.00
 Business Accountant 225.00

DESIGN-WARE
 Creature Creator \$28.00
 Crypto-Cube 28.00
 Spellcopier 28.00
 Trap-A-Zoid 28.00

EDU-WARE
 Algebra 1-4 ea \$28.00
 Algebra 5 & 6 35.00
 Compu-Read 21.00
 Decimals 35.00
 Fractions 35.00
 Prisoner 2 25.00
 Rendezvous 28.00

EINSTEIN
 Einstein Compiler \$99.00
 Memory Trainer 68.00

DOW JONES & CO.
 DJ Connector \$40.00
 Investment Evaluator 110.00

Market Analyzer 275.00

Market Manager 235.00

Market Microscope 559.00

HAYDEN SOFTWARE
 Go \$25.00
 MicroMath ea. 21.00
 ORCA/M 99.00
 Pie Writer 2.2 112.00
 Sargon III 35.00

HOWARD SOFTWARE
 Tax Preparer 1983 \$169.00
 Tax Preparer 1984 CALL

INFOCOM
 Deadline \$35.00
 Enchanter 35.00
 Infidel 35.00
 Planetfall 35.00
 Starcross 28.00
 Suspended 35.00
 Witness 35.00
 Zork I, II, III ea 28.00

KOALA TECHNOLOGIES
 Koala Touch Tablet \$89.00
 Coloring Book 21.99
 Spider Eater 21.00

KRELL SOFTWARE
 Krell Logo \$75.00
 Krell SAT 249.00

L & S COMPUTERWARE
 Crossword Magic \$35.00

LIGHTNING SOFTWARE
 Master Type \$28.00

MICROLAB
 Death in Caribbean \$25.00
 Dino Eggs 28.00
 Miner 2049er 28.00

MICROMAX
 Cubit \$28.00
 (Call for pricing on
 MICROMAX hardware)

MICROSOFT
 MultiPlan \$175.00
 Olympic Decathlon 21.00
 Typing Tutor II 20.00

MONOGRAM
 Dollars & Sense \$79.00

MUSE
 Advanced Blackjack \$35.00
 Castle Wolfenstein 21.00
 Caverns of Freitag 21.00
 Eating Machine 35.00
 Robot War 28.00
 Super Text 79.00

ODESTA
 Chess 7.0 \$49.00
 Checkers 35.00
 Odin 35.00

OMEGA MICROWARE
 Chart Trader + \$149.00
 Inspector 45.00
 Locksmith 5.0 75.00
 Watson 35.00

ORIGIN SYSTEMS
 Exodus: Ultima III \$40.00

PENGUIN
 Bouncing Kamungas \$15.00
 Comp. Graphics Sys. 49.00
 Coveted Mirror 15.00
 Crime Wave 15.00
 Graphics Magician 42.00
 Minit Man 15.00
 Pensate 15.00
 Pie Man 15.00
 Quest 15.00
 Short Cuts 28.00
 Special Effects 28.00
 Spy's Demise 15.00
 Spy Strikes Back 15.00
 Thunderbombs 15.00
 Transylvania 15.00

PHOENIX SOFTWARE
 Masquerade \$25.00
 Sherwood Forest 25.00

SCREENPLAY
 Ken Uston's Professional
 Blackjack \$49.00

SENSIBLE SOFTWARE
 Bookends \$99.00
 Sensible Speller 99.00

SIERRA ON-LINE
 Adv. #0 Mission
 Asteroid \$15.00

Adv. #1Mystery
 House 15.00

Adv. #2 Wizard & the
 Princess 25.00

Adv. #3Cranston
 Manor 25.00

Adv. #4 Ulysses 25.00
 Adv. #5 Time Zone 70.00

Adv. #6 Dark Crystal 28.00
 Dragon's Keep 21.00

Frogger 25.00
 Learning W/Leeper 21.00

Mr. Cool 21.00
 Quest for Tires 25.00
 Sammy Lightfoot 21.00

Troll's Tale 21.00
 Ultima II 42.00

The Artist 60.00
 Homeward 37.00
 Screenwriter II 89.00

SILICON VALLEY SYSTEMS
 Word Handler \$45.00
 List Handler 40.00
 Spell Handler 45.00
 The Handlers Pkg. 99.00

SIR-TECH
 Wizardry \$35.00
 Knight of Diamonds 25.00
 Legacy of Llylgamyn 28.00
 Wiziprint 20.00

SIRIUS
 Critical Mass \$28.00
 Gamma Goblins 12.00
 Gorgon 20.00
 Gruds in Space 28.00
 Orbitron 12.00
 Repton 28.00
 Type Attack 28.00
 Wayout 28.00

SOFTWARE ENTERTAINMENT
 Electronic
 Playground \$20.00
 Stellar 7 28.00

SOFTWARE PUBLISHING
 PFS: File \$95.00
 PFS: Report 95.00
 Masquerade 95.00
 PFS: Graph 95.00
 PFS: Write 95.00
 (Specify for II or IIe)

SPINNAKER
 Alphabet Zoo \$21.00
 Delta Drawing 35.00
 Face Maker 25.00
 Kindercomp 21.00
 Most Amazing Thing 28.00
 Snooper Troops ea. 32.00
 Story Machine 25.00
 Trains 28.00

STRATEGIC SIMULATIONS
 Bomb Alley \$42.00
 BroadSides 28.00
 Carrier Force 42.00
 Computer Ambush 42.00
 Computer Baseball 28.00
 Computer
 Quarterback 28.00

Cosmic Balance ea. 28.00
 Eagles 28.00
 Fighter Command 42.00
 Fortress 25.00
 Galactic Adventures 42.00
 Geopolitico 1990 28.00
 Germany 1985 42.00
 Knights of the Desert 28.00
 North Atlantic '86 42.00
 Prof. Tour Golf 28.00
 RDF 1985 25.00
 Ringside Seat 28.00
 Tigers in the Snow 28.00
 Warp Factor 28.00

STONEWARE
 DB Master V.4 \$279.00

SUB-LOGIC
 Flight Simulator II \$35.00
 Night Mission Pinball 21.00
 Saturn Navigator 25.00
 Space Vikings 35.00

UTILICO SOFTWARE
 Essential Data
 Duplicator \$60.00

ULTRASOFT
 Mask of the Sun \$28.00
 Serpent's Star 28.00

VISICORP
 VisiCalc \$175.00
 VisiCalc IIe 175.00
 VisiCalc Adv. IIe 220.00
 VisiFile 175.00

XEROX EDUCATION
 Chivalry \$35.00
 Fat City 28.00
 Old Ironsides 28.00
 Stickybear ABC 28.00
 Basketbounce 28.00
 Bop 28.00
 Numbers 28.00
 Opposites 28.00
 Shapes 28.00

HARDWARE

JOYSTICKS AND PADDLES
 Hayes Joysticks CALL
 Kraft Joystick 40.00
 Kraft Paddles 35.00

MODEMS
 Apple Cat II \$295.00
 Apple Cat 212 580.00
 Micromodem IIe 259.00
 (Works with all Apples)

PRINTER INTERFACES
 Grappler + \$125.00
 Grappler/16K
 buffer 199.00
 Orange Interface 75.00

80 COLUMN CARDS
 Ultraterm \$279.00
 Videoterm CALL

BLANK DISKS (box of 10)
 Elephant SS/SD \$22.00
 Elephant SS/DD 25.00
 Maxwell SS/DD 30.00
 Verbatim SS/DD 28.00
 Disk File Box
 (holds 60) 20.00

MISCELLANEOUS HARDWARE
 Alaska Card \$99.00
 Microsoft
 Softcard 225.00
 System Saver 65.00

RIISING SUN SOFTWARE
4200 PARK BLVD.
OAKLAND, CALIFORNIA 94602
(415) 482-3391

Ordering Information: We'll accept any form of payment—cash, personal check, money order, VISA/MasterCard, or C.O.D. Send cash at your own risk. Add \$2.00 for UPS shipping; \$3.00 for Blue Label Air. California residents add applicable sales tax. ALL orders shipped same day received. If we are out of stock on a particular item we will include a special bonus with your order when shipped.



CALL TOLL FREE
800-321-7770 (outside California)
800-321-7771 (inside California)



A+ ▶ THAT'S ENTERTAINMENT

▶ GAME REVIEWS

LODE RUNNER

Brøderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170

List Price: \$34.95

Requires: Apple II, II Plus or IIe; 48K;
one disk drive; joystick optional

CIRCLE 499 ON READER SERVICE CARD

The Bungeling Empire, overlords of the galaxy, plunders planet after planet through a series of oppressive fast-food taxes. The Galactic Commandos are a shadowy group of elite freedom fighters who discover the Bungeling's underground treasure filled with gold. The commandos send a strike team, equipped with fast-firing lasers and even faster feet, to take back the Bungeling Empire's ill-gotten booty.

Lode Runner, a hectic arcade game, puts a laser in your fist and wings on your feet as you become a Galactic Commando. Your mission is to infiltrate the treasury, evade the numerous Bungeling guards, and recover all the chests of gold.

The treasury consists of 150 different screens, or rooms, crisscrossed with brick archways, stairs, ladders, hand-over-hand bars, and brick floors. Numerous chests inhabit each of the rooms.

As a commando, you run across floors and arches, scamper up and down ladders, swing along hand-over-hand bars, bound down stairs, and free-fall gently to the ground in pursuit of the gold. Often, Bungeling guards stand between you and the chests, forcing you to draw the not-so-dreaded laser pistol.

Your laser pistol blasts only bricks, not guards, and then only certain types of brick. You must be literally one step ahead of a guard to drill guard-swallowing pits in the brick. The guard falls into the pit, allowing you to dash by as the guard struggles to climb out.

These pits start to fill in of their own accord after a few seconds, although the time is long enough to let the guard escape. If you drill two adjacent pits, the guard will clamber out of the first, fall into the second, and then get squashed when the pit falls in. Pulverized guards reappear at the top of the room.

The Bungelings didn't build an empire by being complete bunglers, so although most of the chests lie exposed on floors and archways, some are buried under layers of brick. This situation forces you to drill a series of contiguous pits, leap into the large hole, and drill

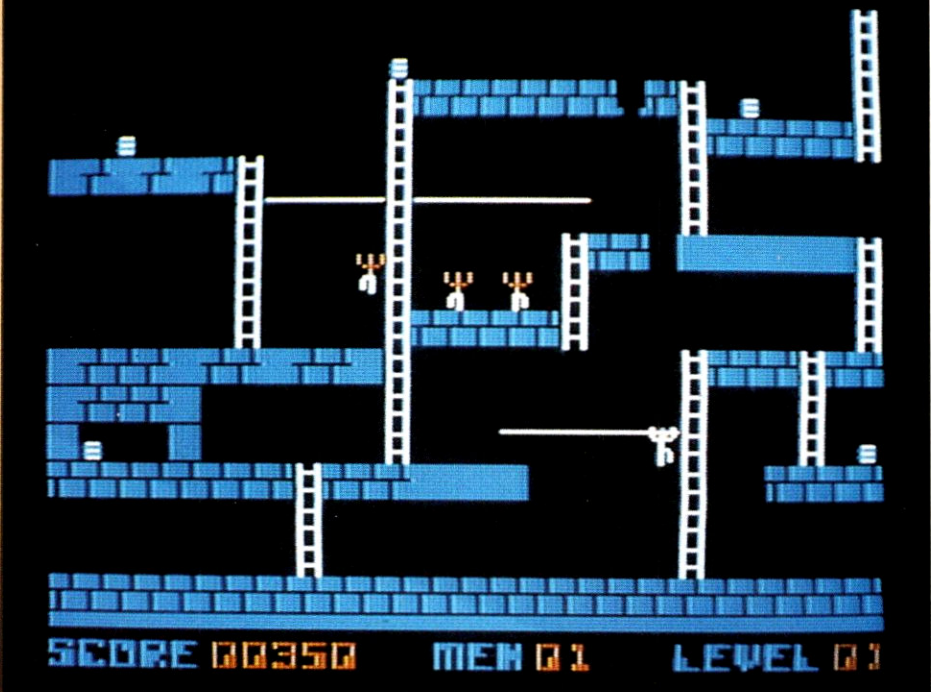
through the next layer before the pit starts collapsing. Eventually, you can break through the last layer and free-fall to the chests.

You may drill bricks only to your left and right, not underneath your feet. If you stumble into a one-brick-wide pit, you cannot climb out or drill downward. You are completely stuck and must watch the relentless process of the pit filling up, which eventually eliminates one of your multiple lives.

Commando Commands

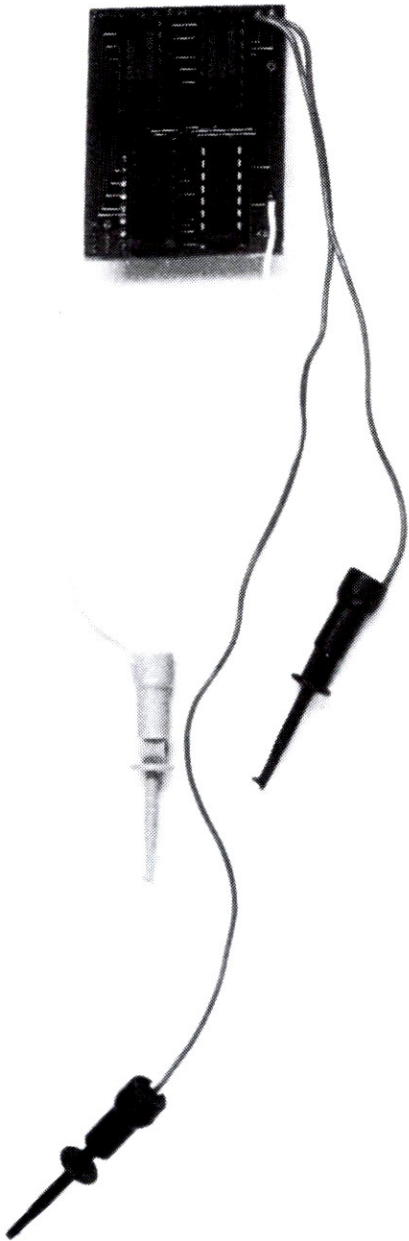
The controls guiding your commando around the screen are fast and responsive. You can use either a two-button joystick or the keyboard. I prefer the joystick because the keyboard commands seem awkwardly placed.

The I, J, L, and K keys represent moving up, left, right, and down, respectively. The U and O keys represent



SPEED YOUR INPUT...

...with this **Keyboard Buffer** from **Central Valley Electronics**. Add 64 bytes of input buffer to your Apple II or Apple II plus. Comes with shift-key modification, installation instructions, and one full year warranty.



Contact your local dealer, or buy direct by sending a check or money order for \$45.00 plus \$2.00 for handling to:
Central Valley Electronics
 Box 33102 Dept. 1009 Kansas City, MO 64114 (Missouri residents add 6% sales tax.)
Dealer Inquiries Invited

A+ THAT'S ENTERTAINMENT

drilling left and right, respectively. This configuration possesses the advantage of needing only one hand for operation. It also requires a tremendous amount of digital dexterity. Proficient typists can probably manipulate the keys fast enough to maneuver commandos out of trouble, but fumble fingers are in big trouble.

Meanwhile, your left hand flaps in the breeze. Brøderbund should have at least made the A and S keys control the drill-left-and-right actions, or, better yet, let players choose their own keys. Of course, the joystick solves all these problems.

Designer Doug Smith did include several thoughtful commands. Repeatedly pressing the left arrow slows down the overall game speed; pressing the right arrow speeds up the game. Control-X and Control-Y flip the x- and y-axes on the joystick, ESC pauses the game, and Control-S toggles the sound on and off.

Smith also programmed in two "cheat" keys. Lode Runner has 150 screens, which, if played consecutively, can chew up a lot of time. Pressing Control-Shift-N advances you one screen, either for practice, or just to see what the other screens look like. Should you

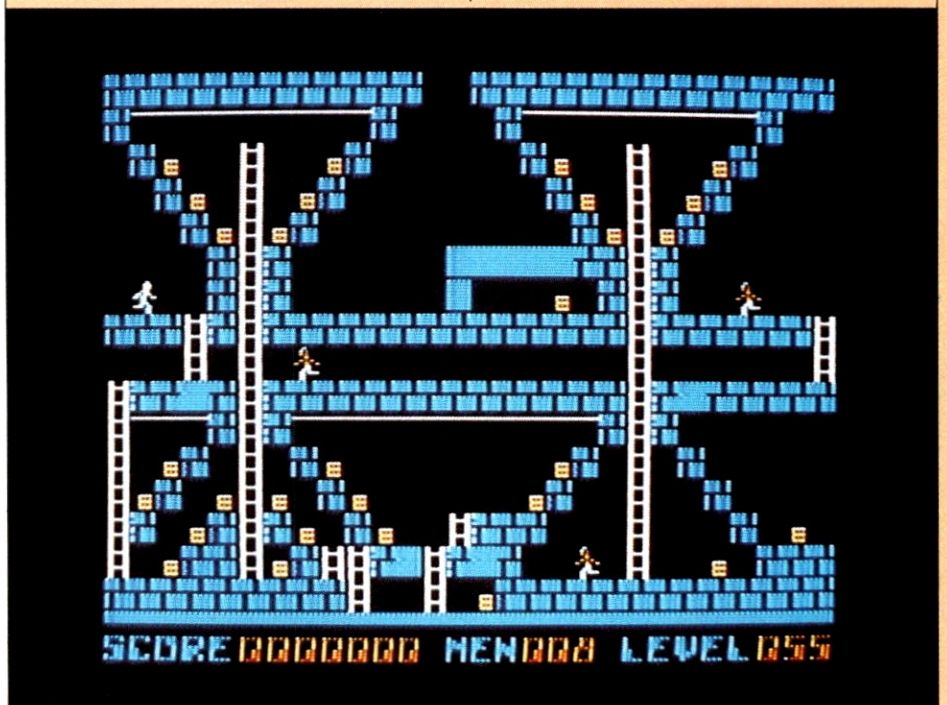
require a few extra commandos to get through the more difficult screens, pressing Control-Shift-P adds additional lives.

The Bungeling guards do a pretty good job of protecting the chests of gold. On occasion they can be absolutely ingenious as they pin you in a corner or catch you between two of them. They also carry the chests around the room while chasing you. On the one hand, the guards carry the chests toward you. On

▶ Lode Runner resembles a Pac-Man-Berzerk hybrid.

the other hand, you must dig pits aggressively to trap the guards and take away the chests.

Lode Runner's graphics are simple and functional, in part, I think, to make room for the 150 screens. The commandos are colored blue and white, and the guards are dressed in a tan shirt, white pants, and blue cap. The bricks are colored blue, the ladders and bars white, and the chests look like red-and-white striped barrels.



The sound effects are as simple as the graphics. The game emits a single beep when you run over a chest, sounds staccato beeps when you dig a pit, and whistles like a descending bomb when you free-fall.

The eight-page rules booklet contains relatively clear instructions for playing the game. Only two pages are actually devoted to game instructions, with the balance discussing an interesting option called the "game generator."

As the name implies, the game generator lets you design, alter, play-test, and save your own unique screens. For such a versatile program, the game generator is surprisingly easy to use.

You start with a blank screen and move the cursor around using the I, M, J, and K keys. To place an object, you press one of the ten numbered keys. For example, pressing 3 puts a ladder on the screen. Pressing 7 draws a chest. Changing your mind is as easy as pressing a different key. You can save up to 150 screens per disk.

Lode Runner resembles a Pac-Man-Berzerk hybrid, with lots of running and chasing and a decent amount of shooting. Yet for all the arcade thrills, some screens test your reasoning as much as your reflexes, especially in figuring out how to drill for buried treasure without getting caught in a rapidly filling pit.

While most arcade games are adding color, backgrounds, and other aesthetic embellishments, Lode Runner keeps its graphics simple. This is not necessarily a shortcoming. After all, poor graphics will ruin a game, but unimaginative graphics will not add to a game's appeal.

The game does give you an astronomical number of different screens, 150 to be exact. In addition, you can create an infinite number of your own screens with the game generator.

Lode Runner will keep you running almost indefinitely with its array of fast, fun, and challenging screens. You can create your own games and then fine-tune the speed to match your reflexes. Lode Runner races with excitement and seems destined to be a lode of fun.

Russ Lockwood

DEATH IN THE CARIBBEAN

MicroLab, Inc.
2699 Skokie Valley Road
Highland Park, IL 60035
(312) 433-7550

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive

List Price: \$35

CIRCLE 500 ON READER SERVICE CARD

Gather 'round, me hardies, to hear a tale about a hoard of pirate gold buried on a lost Caribbean island. Aye, you've never seen a treasure so grand, but beware, mates. Death plagues every path. Only the cleverest of ye adventurers can hope to pass the frightening array of obstacles, find the treasure, and escape the island alive.

▶ **Only the cleverest of ye adventurers can hope to pass the frightening array of obstacles, find the treasure, and escape the island alive.**

Death in the Caribbean, a high-resolution-graphics adventure game, pits your cunning and creativity against a host of natural and supernatural perils. As you explore a lush, tropical island, you pick up items, evade malevolent monsters, negotiate geological hazards, and discover clues to the treasure.

Your quest starts in back of a house, where you immediately learn that this game differs from other adventure games. In most games, you enter the house, pick up a few necessary items, and begin your adventure. In Death in the Caribbean, however, if you try to enter the house at the start of the adventure, you receive the message *Stay out of the house. We have treasure to find!*

To control your movements, you use the standard array of one- and two-word

THE BEST WORD PROCESSOR IN THE WORLD! Well... Maybe...

For The Apple II, II+, and IIe,
Softinson Data Corporation Presents:

THE SOFTGLOW WORD PROCESSING SYSTEM

There are many word processors available for the Apple Computer, each having different features and functions, and each claiming, in some way, superiority to the others. Trying to pick "the best one" to meet your requirements can seem like an impossible task. Softglow, from Softinson Data Corporation, may be the answer. Its features are listed below in some detail, and its price is inexpensive enough to justify its purchase even if you already own a word processor.

Some Facts—Softglow:

- is a true full screen editor for the Apple II, Apple II+, and Apple IIe—at all times, "what you see is what you get."
- is written completely in assembler language—system response time is very fast—screen update is instantaneous.
- uses standard DOS text files—so it's compatible with many other word processors.
- has fast loading of text files—up to 5 times normal speed.
- has standard word processing features—such as word wrap around, alpha lock, tab, and global search and replace; and some nonstandard ones such as soft hyphens and non-break spaces.
- supports lower case, the shift-key modification, and enhancer (under the keyboard) boards.
- utilizes the full capabilities of the Apple IIe.
- has fully buffered input—characters cannot be lost no matter how fast they are entered.
- software is unprotected—so making backup copies is no problem.

And Some Figures—Softglow Has:

- 12 Cursor Control Commands—including move cursor by word, page, and paragraph.
- 5 Modes of Updating Text—insert, delete left, delete right, replace, and case change.
- 9 DOS File Commands—uses standard DOS file-commands are: load, save, delete, catalog, lock, unlock, rename, verify, and initialize.
- 9 Block Commands—including delete, move, and copy a marked block; save and append a mark block to a file; and load a file at the current cursor position.
- 11 Find and Replace Options—including forward and backward search, wild card, whole word search, ignore upper and lower case, and replace all.
- 16K RAM Card—used, if available, for added text space.
- 25 Printer Format Commands—including left, full, center, and right justify; multiple headers and footers; draft copy; file insert and file chaining; the printing of text to any slot, or to a file for later printing or sending; and hyphen help.
- 20 Configuration Parameters—so the system can be customized to individual applications.
- 2K Macro Area—any characters typed at the keyboard can be entered as a macro, to be invoked by a one or two character sequence. Form letters are easily produced using this feature.
- 3 User Defined Files—configuration parameters, macro definitions, and tab stop positions can be loaded automatically at power-up, or loaded anytime while running the editor.
- 32 User Defined Tab Positions.

And The Best Figure Of All:

- \$49.95—check or money order.

Sound complicated? It really isn't. Softglow is extremely easy to learn, and yet, unlike so many others, advanced enough to meet your future word processing needs. It's just possible that, for you, Softglow is the BEST WORD PROCESSOR IN THE WORLD!

To use the Softglow Word Processing System, you will need:

- An Apple II, Apple II+, or Apple IIe, with a minimum of 48K of memory.
- One or more 16-sector disk drives (DOS 3.3).
- A TV set or video monitor.
- A printer with interface card to print out documents.

Apple is a registered trademark of Apple Computer, Inc.

Send \$49.95, plus \$2.00 shipping and handling, to:



Softinson Data Corporation
P.O. Box 230
Penfield, New York 14526

Make check or money order payable to Softinson Data Corp. New York State Residents include 7% sales tax

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

CIRCLE 261 ON READER SERVICE CARD

A + MAGAZINE/MAY 1984 ▶ 131

WHY PAY MORE AT A STORE?

ACCESSORIES

Kensington Sys Fan	64 95
Koala Pad	84 95

MONITORS

Amdek	
Color 11" 13"	299 95
Color III+ RGB 13"	369 95
Amber 12" (GRN \$17.55)	145 95

USI	
Color 14"	285 95
Amber 12" (GRN \$7.55)	144 95

Sakota	
Color 13"	274 95
Color 13" RGB	518 95
Green 12"	109 95

Taxan	
Color 13"	293 95
Color 13" RGB1	307 95
Amber (GRN \$7.55)	154 95

DISK DRIVES

Dana	
D-1 143K w/o cont	219 95
D-1 143K w/cont	284 95

Prometheus	
1/2 Height w/o cont 143K	229 95
1/2 Height w/cont 143K	304 95

Micro Sci	
A2-143K w/o cont	239 95
A2-143K w/cont	309 95

Indus	
GT 143K w/o cont	243 95
GT 143K w/cont	294 95

Vista	
143K w/o cont	249 95

PRINTERS

Okidata	
ML-80 Par	265 95
ML-82A Par/Ser	308 95
ML-83A Par/Ser	549 95
ML-92/P	439 95
ML-93/P	699 95

Transtar	
315 Color	459 95
Pics Option	89 95

Dynax Daisy	
HR-1 Par	579 85
DX-15 Par	439 95

Amdek	
Digital Plotter	819 95
DXY-100 Plotter	592 95

Data Products	
Microprism Ser/Par	499 95
Prism 80 Ser/Par	959 95
Prism 132 Ser/Par	1099 95
Color Option	267 95

MODEMS

Prometheus	
1200	385 95

Hayes	
Micromodem IIe/w/s/c	245 95
Smartmodem 1200	497 95
Smartmodem 300	215 95

Novation	
212 Apple Cat	595 95
Apple Cat II	277 95

SOFTWARE

pfs write (file), file report or graph	83 95
Home Accountant	49 97
Bank Street Writer	49 97
Dollars & Sense	69 95
dBase II	439 95
Friday	199 95
DB Master	229 95
Multipian (DOS)	167 95
Visicalc	178 95
Sensible Speller IV	85 95
Data Perfect	99 95
Incredible Jack	119 95
Pie Writer	99 95
ScreenWriter II	85 95
Personal Investor	99 95
Copy II+	24 95

GRAPHIC INTERFACE CARDS

Orange Micro	
Orange Interface	65 95
Grappier +	133 95
Grappier 16K	186 95
Microtek	
Dumping GX	99 95
Dumping OK	133 95
Dumping 16K	167 95
Practical Peripherals	
Printerface	54 95
Graphiccard	71 95
PKASO II	130 95

MODULES

Titan	
Accelerator II	469 95
Neptune 64K + 80 Col	197 95

Saturn Systems	
32K Ram	159 95
64K Ram	261 95
128K Ram	351 95

Synetix	
Flashcard 147K	\$CALL
Flashcard 294K	\$CALL

Copy Cards	
Wildcard	\$CALL
Wildcard II	\$CALL
Snapshot II	\$CALL
Snapshot III	\$CALL

QUALITY ENGINEERING

P.O. BOX 540, LITTLE ELM, TX 75068

We accept personal checks (2 wks to clear), money orders, VISA/MASTER-CARD, C.O.D. (Add \$2) Add \$3.00 for shipping and handling. Monitors and printers add \$10.00. TX residents add 5% sales tax on all items except software. Prices/availability are subject to change without notice. I carry a full line of Apple compatible products. For a price quote call 214-370-0301, 7:00 a.m. to 11:00 p.m. CST.

ORDERS ONLY CALL 800-428-7825 ext. 42
IN CA. 800-428-7824 ext. 42
24 hours a day, 7 days a week.



Questions and Inquiries
214-370-0301



commands. For instance, typing *look* gives you a description of what you can see. Some of the words, mostly compass points, are abbreviated. For example, typing *n* is the same as typing *north*.

When you use two words, the game expects a verb and a direct object—for example, *unlock door*. Unfortunately, the programming is not as sophisticated as in other adventure games because it ignores any commands in excess of two words. Thus, *unlock door with key* translates as *unlock door*. If you require an indirect object to complete a task, *Death in the Caribbean* will prompt you

▶ You look forward to viewing each beautifully sculpted screen and search for clues as the adventure unfolds before your eyes.

for it by asking *With what?* You then respond with the object of the preposition, such as *key*.

Well, me hardies, I'm off to explore the island. It's got a bloomin' treasure for the taking, and I can leave my black flag at home.

I follow a path north past swaying palm trees and purple flowers until I reach a crossroad. I turn west and come to the top of a cliff. I want to get to the bottom, so I say to myself *climb down*. I'm asked *what*, so I answer *cliff* and immediately plunge hundreds of feet to my doom.

Designers Philip and Bob Hess certainly do not make exploring easy for you. This game is not another follow-your-nose adventure game. When they named the game *Death in the Caribbean*, they used a capital *D*.

Illustrator Barbara P. Lawrence provides brilliant graphics for the game. You feel as if you are standing on the edge of a cliff or wandering along a

treacherous jungle path. You look forward to viewing each beautifully sculpted screen and search for clues as the adventure unfolds before your eyes. Best of all, the graphics appear quickly, taking about three seconds between each screen.

After an untimely demise, you proceed to a final resting spot that you have to experience to fully appreciate. Your fresh grave, complete with a tombstone etched with R.I.P., occupies center screen under a pitch-black sky. Behind the grave, a stone wall marks the edge of the cemetery. A bird sits on the wall. In such eerie surroundings, you expect a vile vulture, or at least an omniscient owl. To keep events in humorous perspective, however, a grinning pelican perches on the wall.

By Blackbeard's eyepatch, me hardies! I have more lives than a cat, and fate returns me to the front of the house. I must be more careful, lest I tempt fate twice.

I walk back to the crossroad, but this time turn east. I wander through the lush countryside and eventually find a wagon. I pull and push the wagon, but cannot move it. I stroll along another path, but it ends in a rock slide. I double back, and eventually reach an old church.

The church proves a pretty sight, with elegant stained-glass windows all around. I try the doors, but they are locked. I break a window, but am admonished *Don't be so destructive! Use violence only when necessary!* A key must be somewhere on this island. I continue to explore.

I find a large hole in the ground at a trail ending in a T junction. A sign stands nearby. It says, *Danger! Man-Eating Ants*. I decide to heed the warning to use violence only when necessary and exit quickly to the south.

Lo and behold, I find a purple box. I say to myself *open box* and then see that *the box is opened*. *The lining of the box is beautiful!* I see an object inside that looks like a key. I take the key and head back to the church. I reach the ant hole, but before I can run to the west, the ants burst from the hole. I greet the grinning pelican again.

WRITE YOUR OWN APPLE GAMES

Includes 40 exciting pre-programmed games to get you started!



The game includes detailed graphics for more than just pretty appearances. Unlike pure-text adventure games, *Death in the Caribbean* requires you to make decisions based on the graphics and text. In several places on the island, the text omits certain important details. For example, you see the key inside the

▶ **Unlike pure-text adventure games, *Death in the Caribbean* requires you to make decisions based on the graphics and text.**

purple box, but the text dwells only on the lining. In another instance, you see logs bridging a crevasse. The text describes the bottomless crevasse but fails to mention the logs.

The game does not contain extensive documentation, so you can't look for hints in the rules. It gives you a half page of general instructions about com-

mands, how to save up to nine games on the disk, and loading in saved games. You also get a brilliant, four-color map of the island.

The map marks all the trails on the island and provides numerous pictorial hints. For instance, it shows a lethal cliff splitting a trail in two. Given the circumstances surrounding cliffs and falling objects, other hints—such as a crevasse, a swamp with an alligator, and a pasture with a raging bull—should be considered dangerous.

If you have trouble figuring out how to get past obstacles, such as a cliff or an ant hill, MicroLab will answer your questions over the phone.

By Captain Hook's hook, me hardies, 'tis a devious place, this island is. Yet fate returns me to the house again. Only this time, Providence whispers secrets to me, so I can get a better look around. Nay, I cannot reveal them, for then they are no longer secrets.

I pass the rock slide, then the ant hole. I pick up a wagon, a ring, then a key. I enter the church without harming a single section of stained glass and find a trapdoor. Unfortunately, the basement is dark and I need a lantern to see my way around.

Write Your Own Apple Games is your ticket to thousands of hours of solid game fun.

But it's more than just a game book. While you're enjoying more than 40 exciting new programs, you'll be learning—quickly and easily—the most advanced techniques of computer game design.

In *Write Your Own Apple Games*, Stuart Anstis explains each game to you in logical, step-by-step subroutines. You'll see crucial game graphics exactly as they should appear on your screen.

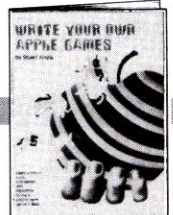
Then you'll learn how to rearrange the basic subroutines to create countless game variations.

If you know BASIC, you're ready to learn state-of-the-art game techniques, including how to create smooth, flicker-free screen movement. Generate flashing "neon-sign" graphics. Keep game scores. Use random numbers in game design. And much more.

Write Your Own Apple Games gives you all the skills you need to start designing your own original computer games for fun—and profit!

And because writing your own games gives you greater control of your Apple's numerical and graphic capabilities, you'll be opening the door to fantastic new possibilities for using your computer.

Start having some serious fun with your Apple computer. Send for your copy of *Write Your Own Apple Games* today.



MAIL TODAY TO:
CREATIVE COMPUTING PRESS

Dept. NQ5C
39 East Hanover Avenue, Morris Plains, N.J. 07950

Please send me _____ copies of *Write Your Own Apple Games* for only \$12.95 each, plus \$2.00 shipping & handling per book. # 2W.

Total amount \$ _____

Payment Enclosed. (CA, NJ and NY State residents please add applicable sales tax).

CHARGE MY: MasterCard
 American Express Visa

Card No. _____ Exp. Date _____

Signature _____

Name _____ (Please print)

Address _____

City _____

State _____ Zip _____

*Outside the U.S.A. add \$3 for shipping and handling.

Check here to receive FREE catalog of computing books, magazines and guides.

For faster service, **PHONE TOLL FREE** (In NJ only:
800-631-8112 201-540-0445)

Also available in your local bookstore or computer store.

R+ THAT'S ENTERTAINMENT

I leave the church and walk to the graveyard, where I come across a grave and a shovel. I take the shovel. After all, you need a shovel to unearth buried treasure. I look at the tombstone.

It reads Hood. I don't recall ever meeting a Captain Hood. Perhaps Robin Hood? Nay, squid brain, what would Robin Hood be doing on a lost island? This is the Caribbean, not England. Palm trees don't grow in Sherwood Forest, and coconuts certainly don't migrate. I must be getting daft. I leave and round up some rope and wood.

Then I see it. It flickers in front of me for a few seconds, then disappears. It is a puffy, white cloud wearing a green hat with a feather. Shiver me timbers! It's the ghost of Robin Hood! Make that Robbin' Hood, for he steals my key.

I bolt from the spot, climb down the cliff, and run along twisting jungle

paths. Before I get a quarter of the way across the island, Robin Hood returns and steals my wood. Then my ring. Surely a way exists to exorcise this pilfering poltergeist.

I race across the entire island, passing enchanting scene after scene but find no X marking the spot of the treasure. I do find a green hat with a feather, which makes me think I can dematerialize this specter that spirits away my hard-earned possessions. Unfortunately, I am also in quicksand. I cannot free myself and sink beneath the shifting sands. That blasted pelican comes into view again.

Death in the Caribbean can be downright frustrating sometimes, although you usually end up kicking yourself for making dumb mistakes and omissions. Imagination, resourcefulness, and a touch of logic should get you out of most situations. You're not going

to complete the game in an afternoon. This adventure will take a long time to solve.

As with any adventure game, manipulating objects with command words takes some patience and practice. Actions that seem logical are sometimes considered illegal. For instance, you cannot smash a stained-glass window to unlock the church door from the inside.

No skull and crossbones about it, Death in the Caribbean breathes new life into adventure gaming. It embodies all the necessary elements for a successful adventure game—lots of helpful items, vexing problems, a touch of humor, and a ghostly thief—and adds spectacular graphics.

Well, me hardies, I failed to find a single doubloon, which means the treasure still lies buried on the fantasy island.

Russ Lockwood

THE SENSIBLE SPELLER™ IV CORRECTS SPELLING MISTAKES IMMEDIATELY.

The most popular new word-processing product introduced for the Apple computer in 1982 was not a word processor—it was the SENSIBLE SPELLER IV proofreading program.* A perfect complement to your current Apple word-processing program, the SENSIBLE SPELLER IV is fast, friendly, and gives you the features you need in a spelling checker.

First in features**

It only takes a minute or two for the SENSIBLE SPELLER to scan through a ten-page document and compare each word against its 80,000-word dictionary. Each misspelled word is shown to you in the middle of a small excerpt from your document, so you won't waste time trying to remember how you used the word.

You can immediately correct the misspelled word by replacing it with the proper spelling. The SENSIBLE SPELLER even suggests the correct spelling for your misspelled words!

First in dictionaries

The SENSIBLE SPELLER includes the largest, most authoritative dictionary available for the Apple computer. Over 80,000 words are supplied, direct from the official Random House Dictionary. And there is unlimited room to add your own special words. The official Black's Law Dictionary is available separately.

First in word-processor compatibility

The SENSIBLE SPELLER works with more Apple word processors than any other spelling program, including: DOS 3.2, DOS 3.3 (Apple Writer—all versions, Bank Street Writer, Magic Window, Screen Writer, etc.), SuperText, Word Handler, CP/M (Wordstar, etc.), and PFS: WRITE word processors.

The SENSIBLE SPELLER is available for \$125 and runs on all Apple II+, II+, and Apple-compatible computers with one or two disk drives.



**Sensible®
Software, Inc.**

24011 Seneca
Oak Park, MI 48237
(313) 399-8877

Please add \$1.25 for shipping.
Visa/Mastercard/Check/COD welcome!

*April 1983, Softalk magazine reader survey.
**Not all features are available with CP/M. PFS: WRITE and Word Handler.

PFS: WRITE is a trademark of Software Publishing Inc. Apple, and Apple Writer are trademarks of Apple Computer, Inc.; Bank Street Writer — Brodebund; Black's Law Dictionary — West Publishing; CP/M — Digital Research Corp.; Screen Writer — Sierra On-Line, Inc.; SuperText — Muse Software; Word Handler — Silicon Valley Systems; WordStar — Micropro International

**Now works with
PFS: WRITE**

CIRCLE 403 ON READER SERVICE CARD

▶ GAME FEATURE

HI-RES MASTERTYPE

A shoot 'em up game that teaches you how to type

Hi-Res MasterType by Bruce Zweig has to be considered one of the classic Apple software packages. Since 1981, individuals at home and in schools and businesses have taken advantage of this unconventional typing program. If you are unaware of this product, welcome to the high-technology revolution. Simply by playing a fast-paced computer game, you can learn how to type or improve your typing skills. If your keyboard speed or typing rudiments need work, Zweig's program can make you more productive while you have fun.

Hi-Res MasterType is so versatile that it may appeal to you even if you think you don't like computer games. You can control the pace and start at the home row (ASDFGHJKL;) which, as human typing tutors know, is the launching pad for touch-typists. You can also design your own lessons for specific purposes and save them on separate data disks.

The Wizard of MasterType

When you enter MasterType's world, you will learn that letters and words can be dangerous if you fail to find them quickly on the keyboard. You must learn the keyboard in order to win this computer game, which is part of the Space Invaders, shoot 'em up, genre.

After the colorful logo has appeared on the screen, the program asks you to choose from a selection of lessons, including one that you have created yourself. The program disk contains 18 different lessons that become increasingly more difficult. The first three lessons cover the home-row keys. You begin trying to type the single letters that appear in the corners of the screen and proceed to three-, four-, and five-letter words.

The next five lessons review the rows above and below the home row and feature longer words. Lessons 9-13 provide practice, starting with three-letter words and increasing to nine-letter words using all letters. Lessons 14-17 review numbers and shifted and unshifted symbols. Lesson 18 lets you practice words from the BASIC computer language such as FOR, NEXT, and PR#6.

Once you have chosen your lesson, the program takes you to the main menu. Here you can choose to play in the Beginner mode, which is the easiest game, change various options, watch an uninterrupted demo, or quit the entire game.

The Change option takes you to an eight-choice submenu. Choice 1 lets you toggle the Beginner mode, in which words are only one letter long and you don't have to press the space bar after each letter, on or off. Choices 2 and 3 lower and raise the speed goal, respec-

tively, which determines how fast you must type the words. An average initial speed goal is 14-29 words per minute. The fourth option lets you change your lesson or end the game altogether.

For more of a challenge, choice 5 switches from the Cadet mode to the Commander mode. If you don't choose the Beginner mode, you start out as a Cadet, which enables you to see what you type in the middle of the screen. When you're a Commander, the letters don't appear in the center of the screen as you type them. Thus, the game becomes more difficult to play, as your technique develops.

Sound is optional, and you can turn it on or off with option 6. You can change the screen display from all uppercase letters to lowercase with choice 7, a useful option for Apple IIe users who want practice in using the Shift key for uppercase letters.

MasterType in Space

After you have selected your lesson,



Videx
INC.™

Innovation

State-of-the-Art products, such as UltraTerm® our 128-column display card, providing more of what you need when you need it.

+

Quality

Each Videx Product is fully tested, TWICE, before it ever reaches your computer. That's why Videoterm has the best track record in the business.

+

Support

Ask your Dealers and friends! Quick, Competent help, just a phone call away, has made Videx the recognized leader in customer support.

=

Excellence

Videx...It all adds up...for YOU!

You can't buy better products to enhance the power and ease-of-use of your personal computer.

Videx
INC.™

For More Information Call us at
(503) 758-0521
1105 N.E. CIRCLE BLVD
CORVALLIS, OR 97330

CIRCLE 141 ON READER SERVICE CARD

A+ THAT'S ENTERTAINMENT

mode of difficulty, and speed, you move on to the game itself. In the middle of the screen is your home base. Single letters or words in the four corners appear and constantly move toward your base. You must correctly type the word or the letter and perhaps press the space bar in order to blast an enemy. The four enemy "craft" approach your home base until you have typed the letters or words in the appropriate corners of the screen. If you fail to type the correct series of letters quickly enough, your shields, and eventually your home base, will fall prey to the advancing words and letters.

Once you have typed a word or letter, a bolt of lightning destroys that word or letter as it approaches your home base.

▶ Enemy 'craft' approach your home base until you have typed the letters or words.

Remember, though, that you still have three more enemies to zap. More words or letters appear in the corners until the wave of attackers ends or you make too many mistakes.

The game is fast. Like the best arcade games, the parts that require fast action were written in assembly language, and the BASIC portions were compiled.

You score points if you successfully defend yourself—you score the most points when you are in the most difficult mode, the Commander mode. If you do not type quickly or accurately enough, the words will eventually destroy your home base. After each attack wave, you get a chance to practice any words or letters that are especially difficult for you.

Also after each wave, your score appears on the screen. This information diagnoses your abilities and prescribes whether you should work on the same lesson or move on. You can print out this evaluation, which includes your point score, average speed per minute, final speed, number of words typed,

words destroyed, mistakes, previous high score, and lesson number. Reported speeds are accurate, with an 8% deviation. You also get a reinforcement message such as Your score is good or A winner.

Creating Your Own Lessons

One of the better features of Hi-Res MasterType is that it lets you come up with your own lessons, which gives the program continued flexibility even after you have mastered the 18 lessons the program disk contains. Every time you create a lesson, you must give it a name, add your own instructions or reinforcers, and include 40 different words. Words can contain from 1 to 9 characters but cannot have any blank spaces. The instructions advise you to start each word with a capital letter if you are using a IIe.

You can save lessons on any standard DOS 3.3 initialized disk, so the number that you can create is unlimited. Games are stored as text (T) files and require three sectors of disk space. You won't have any trouble accessing your own lessons from the program disk, and editing or deleting files is simple. For students, we suggest spelling and vocabulary lists as sources of words for games they create, so MasterType can serve as a learning aid in more than one discipline.

We've been using Hi-Res MasterType with students for the past two years, and our initial, positive opinion of it has not changed. If anything, we've found it to be even more effective and enjoyable than we originally thought. It's such a pleasant supplement to regular typing drills.

▶ PRODUCT INFORMATION

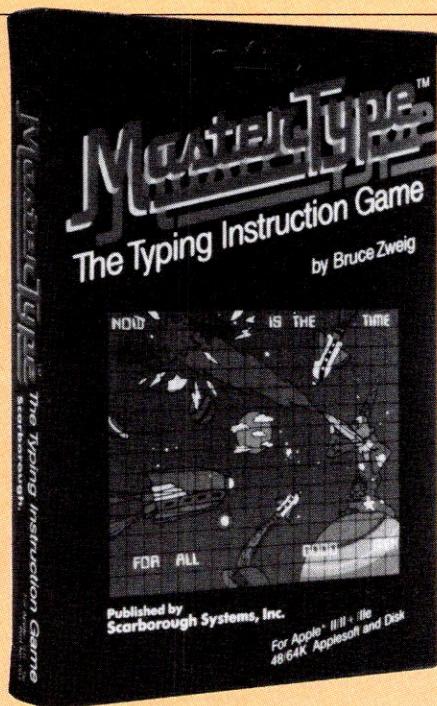
Hi-Res MasterType, Version 1.7

Scarborough Systems, Inc.
(originally from Lightning
Software, Inc.)

25 North Broadway
Tarrytown, NY 10591
(914) 332-4545

List Price: \$39.95

Requires: Apple II, II Plus, IIe, or III in the Emulation mode; 48K RAM; DOS 3.3; one disk drive; black-and-white or color monitor.



We've seen this program in action with students of all ages. Business and word-processing teachers in our region have used it in their classes, as have teachers in elementary and middle schools, where typing is not yet a part of the curriculum. We have also used it in several adult computer classes, and it has always been a popular and effective item.

MasterType seems suitable for elementary students, as soon as their fingers are big enough to cover the home row. The earlier children start learning how to type correctly, the less likely they will be to develop bad keyboard habits later on.

Users of the program will find all important instructions on the screen. If you are using a IIe, you have to turn on the Caps Lock key in order to make your selections from the main menu. After that, you can use either uppercase or lowercase letters, or both.

Since you have to access the program disk whenever you change lessons, you must keep it in your disk drive at those times. Otherwise, this well-protected product can be shared among computers.

Like many current programs, Hi-Res MasterType checks to see if it is op-

erating on an Apple II Plus or IIe, during the start-up process, and behaves appropriately. The program has versions for computers other than the Apple, so it must work with several different types of keyboards, emphasizing the standard typewriter keys. You have to remember that on the II Plus and IIe, keys such as ", ', and @ are in unusual locations.

Versatile Manual

MasterType's 50-page manual contains general typing instructions as well as specific instructions for each computer the program works with. It also provides strategies for playing the game, including ways to avoid getting blown up and methods for scoring bonus points.

New Company for Support

Lightning Software, the original publisher of Hi-Res Master type, was very helpful to its customers. Program disks were under warranty for 30 days and were replaced free of charge if problems arose. After 30 days a replacement disk cost \$5. Registered users also received a MasterType newsletter informing them of new lessons or enhanced programs.

In September 1983 Scarborough Systems purchased Lightning Software. We do not know of any specific changes that this company has made in the support of MasterType.

Living Legend Lives On

We highly recommend this product. It has become easier to use since its initial release, the manual is more comprehensive, and the price is lower. Enhancements such as these are tough to beat and should assure that Hi-Res MasterType will remain on the best-seller list for years to come. +

▶ PRODUCT NEWS

Electronic Playground

Electronic Playground is an educational program designed for children ages 3-8 years. It is divided into three parts: Matchbox, a three-part game that allows matching of shapes, uppercase to

COMMUNICATION PROBLEMS?



PERSON-TO-PERSON™ PROVIDES THE INTEGRATED SOLUTION

Data, voice and mail, PTP 1.1 handles them all. PTP keeps a single comprehensive phone, address and memo database. With this file, it prints, dials and runs computer communications. Perfect for the home. A productivity tool for business.

- Dials voice calls, can use non-Bell long-distance, send tone-dialed data
- Displays any address in 2 seconds, revise memos during calls
- Print an envelope, filing card, mailing list or merge-print form letters
- Up or download data files or electronic mail
- Auto log-on or prompted auto answering with auto up or downloading
- Alternate voice and data

PTP has interactive prompting and is totally menu-driven. It's convenient, versatile, fast and friendly.

Person-to-Person. The integrated communications database for the Apple II and //e from Trutec Software.™ Only \$69.95.

Ask your dealer for a demo. Or order direct by phone or mail. Credit card orders accepted by phone. By mail send check or money order. Add \$3.00/shipping. California residents add 6% sales tax. Dealer inquiry invited.

Minimal system: 48K, 1 disk drive. Optional: modem* printer, 16K card, 2nd disk drive, 80 column card, //e features. Capacity (64K) about 1400 listings per file. Also suitable for general filing.

*Modems supported: Hayes Micromodem II or IIe, Smartmodem 300 or 1200 (with Apple Super Serial Interface), Novation Apple-Cat II and compatibles of these.

Apple is a registered trademark of Apple Computer. Micromodem II and Smartmodem are registered trademarks of Hayes Microcomputer Products. Apple-Cat II is a trademark of Novation.



1700 Solano, Berkeley, CA 94707
Orders: 800-621-3744 (In CA 415-525-4901)

CIRCLE 366 ON READER SERVICE CARD

A+ MAGAZINE/MAY 1984 ▶137

A+ THAT'S ENTERTAINMENT

lowercase letters, and numbers; Magic Blackboard, a drawing and coloring program; and Heidi's Program, which offers a flood of colors and sounds when you press different keys.

The program features a Hi-Res Picture Catalog that allows you to save, load, and delete pictures using a joystick. It also uses icons. (List Price: \$24.95)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; joystick
Software Entertainment Company
537 Willamette
Eugene, OR 97401
(503) 342-3495

CIRCLE 504 ON READER SERVICE CARD

Basketball Computer Game

Boston Celtics star Larry Bird and Julius Erving ("Dr. J") of the Philadelphia '76ers helped programmer Eric

Hammond create a game that simulates a real-life basketball experience. Called Julius Erving and Larry Bird Go One-on-One, the disk-based game reproduces these players' images and captures their moves and strategies.

The game includes a 24-second shot clock, a game clock, a scoreboard, plus a backboard that shatters when a player makes a ferocious dunk. Players can choose one character and play against the computer, or two players can play against each other. Players can play either for a set length of time or until they reach a set score. (List Price: \$40)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; joystick
Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171

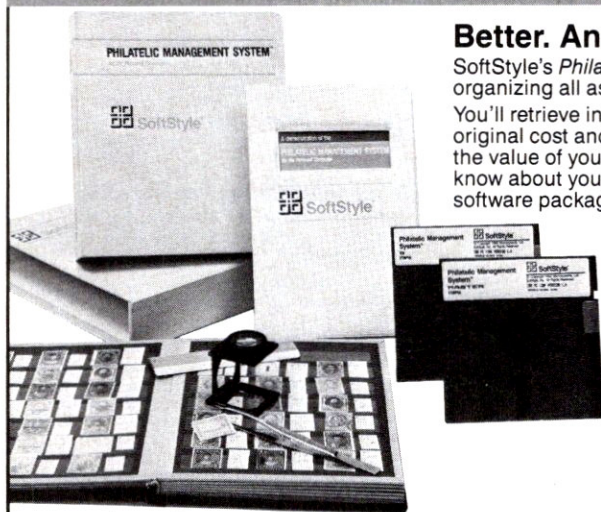
CIRCLE 505 ON READER SERVICE CARD



Regatta

The action in Regatta (for one or two players) begins at one of four lakes on a course marked by three buoys. Each player sets sail and controls the tiller to maneuver through the course. A clock,

Now SoftStyle offers two philatelic systems.



Better. And the best.

SoftStyle's *Philatelic Management System*TM is the most powerful system available today for organizing all aspects of your stamp collecting.

You'll retrieve instant data about your singles, blocks, sheets, covers and other items... with original cost and current value... tracking price lists, catalogs, and even dealers. You'll know the value of your collection or any part of it. It's a snap to find out most anything you want to know about your collection. In all, there are over 40 integrated programs in this well-proven software package. It's the best.

Inventory Module. If you wish, you can start with the Inventory Module of this great system. It includes everything you need to control your stamp inventory with over 20 selected programs from the complete *Philatelic Management System*. For a nominal charge you can easily expand to the complete system since the Inventory Module is fully compatible with the complete system.

Demonstration Package. Try our Demonstration Package for just \$15. See for yourself why the Inventory Module is better... and the complete *Philatelic Management System* is the best. Check your choice below and place your order today:

- Free Brochure.**
- Demonstration Package.** Introductory manual and demonstration diskette. \$15, credited to your package purchase.
- Philatelic Management System/Inventory Module.** Over 20 selected programs, demonstration package, installation guide and professional instruction manual. \$159.
- Philatelic Management System.** The complete system with over 40 programs plus all of the above. \$295.

Your computer type (needs 128K and 2 diskette drives):

- IBM PC
- Apple III
- Apple IIe

Order toll-free: (800) 367-5600

MC/VISA accepted or send check/MO. Add \$2 shipping/handling for U.S. & Canada, others \$12. For IBM specify SS or DS disks.

SoftStyleTM

SoftStyle, Inc. • Suite 205, Dept. P • 7192 Kalaniana'ole Hwy.
Honolulu, Hawaii 96825 • Phone (808) 396-6368

CIRCLE 101 ON READER SERVICE CARD

visible on the screen, tracks elapsed race time, and the program saves record-breaking times for future reference. As in actual sailing, a penalty accrues to a player's time whenever the sailboat hits a buoy or runs aground.

An illustrated manual describes strategies and explains basic nautical terms such as running, reaching, tacking, and yawing. (*List Price: \$29.95*)
Requires: Apple II, II Plus, or IIe; 48K RAM; Applesoft; DOS 3.3; one disk drive; game paddles or joystick optional
Howard W. Sams & Company, Inc.
4300 West 62nd Street
Indianapolis, IN 46268
(317) 298-5400

CIRCLE 506 ON READER SERVICE CARD

Four Educational Games

Ten Little Robots is designed to introduce children ages 2-7 to the computer.

It includes five different learning games: Little Robot Story, a nursery tale that introduces subtraction and prepares children for reading; Robot Letter Match; Count the Robots; Robot Addition; and Robot Sketch, a painting game.

Ships Ahoy is designed for children ages 5-13. You sail your ship across the sea and avoid a treacherous mine by correctly answering math problems. You can choose whether to add, subtract, multiply, or divide and can select a difficulty level. The package includes three other games: **Mine Sweeper**, in which you use a joystick to detonate the mine whose value correctly completes an equation that appears at the top of the screen; **Treasure Hunt**, a maze game; and **Sailing Sketch**, a painting game.

Race Car 'Rithmetic is a math game for one to four players. Players compete

on their own level in a race to the finish line. You can select your own operation (addition, subtraction, multiplication, and division), difficulty level, and time factor. It also includes an arcade-style **Race Car** game.

Funbunch, a language-arts game, is available on three levels: grades 1-6, junior-high school, and high-school to adult. Each level includes over 2000 words and phrases, and you can also enter your own. It includes a **Computer Doodle** drawing game. (*List Price: \$39.95 each*)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive
Unicorn Software
Liberace Plaza, Suite 8
1775 East Tropicana Avenue
Las Vegas, NV 89109
(702) 798-2727

CIRCLE 503 ON READER SERVICE CARD

**20 MB
Hard Disk
only \$1645!**

PLUG IN AND GO! We have a full line of Apple compatible 5-25 MB removable cartridge and/or fixed drive systems. All drives come complete with:

- Cabling
- Installation instructions
- 120 day no-hassle warranty
- Factory tested

Send for our **FREE** catalog—Circle the reader response number!
Call Toll Free to order: 1 (800) 531-5002. In Texas call (512) 441-7890.

CIRCLE 133 ON READER SERVICE CARD

**Slimline & Full size
Floppy Disk Drives
from \$199.95**

Controller cards
only \$59.95

6301 B Manchaca Rd. Austin, TX 78745

**M
I
C
R
O
S
O
F
T
D
E
S
I
G
N**



Jury Trial II

Jury Trial II, an advanced version of Navic's courtroom strategy game Jury Trial, features an enriched cast of characters supported by individual dossiers in the accompanying documentation. Among the new personalities are Mr. Wallbanger, the town drunk, and the

Among the new personalities are Mr. Wallbanger, the town drunk, and the voluptuous Linda LaVerne, a flirtatious nightclub dancer.

voluptuous Linda LaVerne, a flirtatious nightclub dancer.

Players, in their roles of prosecutor and defense attorney, attempt to stack the jury by choosing candidates biased in favor of their own respective sides, but even though the jurors exhibit favoritism, the trial is won or lost by the tactics of the competing attorneys.

Players interview the venerable county sheriff in order to develop case evidence, and during the trial the computer acts as judge. Players are re-assigned and challenged with a different case every time they play the game.

(List Price: \$49)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive
Navic Software
12150 Captain's Landing
North Palm Beach, FL 33408
(305) 627-4132

CIRCLE 508 ON READER SERVICE CARD

Crypt of Medea

It's a stormy night and you find refuge in the only available shelter, an eerie mausoleum. As you hear the gate slam shut behind you, your worst fears materialize—you are now trapped in the Crypt of Medea.

Thus begins an exciting new high-resolution adventure program. Crypt of

Medea takes you through dark travels in an underground of terror. You must pass through countless hidden passages and secret rooms if you ever want to see the light of day again.

But beware! All of the horrors you ever imagined await you at every turn. Avoid the ghoulish obstacles of the forbidden chambers or face eternal entombment. The program features simulated 3-D color graphics plus graphics and text animation. It also has Mockingboard capability, which allows the game to "talk" to players, although a Mockingboard is not necessary to play the game. (List Price: \$34.95)

Requires: Apple II, II Plus, IIe, or III; 48K RAM; Applesoft; one disk drive
Sir-Tech Software, Inc.
6 Main Street
Ogdensburg, NY 13669
(315) 393-6633

CIRCLE 509 ON READER SERVICE CARD

Stories Alive! Interactive Books

At crucial points in these stories, readers, by responding to a list of options the computer supplies, make real-life decisions that directly alter the plot. Each title has from 15 to 50 possible endings. The computer refers to the reader by name throughout the story; it also permits the reader to put in up to nine bookmarks for later exploration. The following titles are available now, with more to come in future months: *Island Love* by Brandy York; *The Mystery of Bat Cave* by Anne Schraff; *Approaching Terminal Station* by Richard Robinson; and *The Riddle of the Redstone* by Ann Marie.

(List Price: \$30 each)

Requires: Apple II, II Plus, or IIe
Home Computer Software
1307 South Mary Avenue, Suite 209
Sunnyvale, CA 94087
(408) 735-8400

CIRCLE 510 ON READER SERVICE CARD

Star Search

In Star Search, Pluto star base receives a signal from the direction of Epsilon Eridani and the players have their mis-

sion. Each player is captain of a ship and must choose crew and supplies to search for the signal's origin. You can gather information by flying probes through planets' atmospheres or even land a pinnacle with crew members.

You can enter an asteroid belt to conserve fuel, but be ready to dodge meteoroids or destroy them with your laser gun. You win the game by managing your resources well and making discoveries. (List Price: \$45)

Requires: Apple II; 48K RAM
Earthware Computer Services
P.O. Box 30039
Eugene, OR 97403
(503) 344-3383

CIRCLE 511 ON READER SERVICE CARD

Sorcerer

Sorcerer is the second release in Infocom's Enchanter series of fantasy adventures in the mystic arts. Players advance toward their goal through the use of magical powers that they acquire along the way. The program can understand a vocabulary of more than 1000 words.

The package contains the game disk;

Players advance toward their goal through the use of magical powers that they acquire along the way.

a user manual, *Popular Enchanting Magazine*; a colorfully illustrated rotating data wheel, called Creatures of Frozbozz Infotater; and a holding pouch. (List Price: \$49.95)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive
Infocom, Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031

CIRCLE 512 ON READER SERVICE CARD



Reliable.

You can count on 3M diskettes. Day after day.

Just like the sun, you can rely on 3M diskettes every day. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Apple® Compatible.

3M makes diskettes for use with Apple computers, including specially designed Fileware™ diskettes for the Lisa™ personal office system. Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.



Apple, Apple logo, Fileware and Lisa are trademarks of Apple Computer, Inc.

3M hears you...

CIRCLE 289 ON READER SERVICE CARD

3M

ASCII EXPRESS

Like a little bit of paradise.



No other telecommunications software offers you so much flexibility, speed or ease of use.

Whether you're a business professional dialing up far and distant places or an at home user talking on the local bulletin board, you'll love the variety of features only ASCII Express gives you.

Exclusive to ASCII Express are features such as the most extensive macro library for unattended call-up and receiving of information, a text editor for composing messages without a word processor, and it handles data transfer at speeds up to 9600 baud.

The ASCII Express supports a full range of 80-column boards and printer interfaces. It allows the sending of electronic mail—and it has the ability to emulate over a dozen different terminals.

There's an easy to understand manual and throughout the program you'll find help menus that make using the ASCII Express an absolute dream.

To learn how the ASCII Express can take you to paradise, see your local dealer, or call UNITED SOFTWARE INDUSTRIES at 213-556-2211.

ASK FOR ASK-EE

*Available for Apple, IBM PC, IBM compatibles, CP/M 80 and CP/M 86 machines.



Apple, IBM are registered trademarks of Apple Computer Inc. and International Business Machines Corporation respectively. © 1984 United Software Industries Incorporated. All rights reserved.

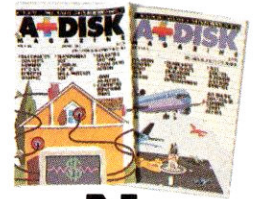
CIRCLE 295 ON READER SERVICE CARD

UNITED
SOFTWARE INDUSTRIES
1880 Century Park East, Suite 311
Los Angeles, California 90067

I N T R O D U C I N G

A+DISK

M A G A Z I N E



A collection of ready-to-run programs and documentation for Apple computers makes its debut.

It had to happen: With all of the computer magazines vying for your attention, now there's a magazine for your computer to read. *A+ Disk Magazine's* premier issue appeared in computer and bookstores in mid-March. The product, as its name implies, uses a magnetic disk instead of ink and paper to convey its message. The first edition includes ten ready-to-run programs for Apple II, II Plus, and IIe computers, together with a complete manual.

It represents, according to its designers, an entirely new way for authors to reach the owners and users of Apple II computers. "This is not a magazine on diskette," said Editor Morris Efron. "The printed page is still the best way to convey information for human eyes. The point of *A+ Disk Magazine* is to convey software in the easiest, quickest, and most efficient manner possible."

The monthly *A+ Disk Magazine* was developed by Ziff-Davis Publishing, publisher of *A+* magazine and many other popular "conventional-format" magazines devoted to computer users. The first issue had a press (and disk) run of 20,000 copies, which will run on any Apple II, II Plus, or IIe or compatible machine with at least 48K RAM, with Apple DOS 3.3 and one disk drive. The magazine sells for \$29.95 at computer and bookstores (\$119.95 for a six-issue mail subscription). Current plans call for nine issues per year.

"We took a good, long look at the

software on the market for the Apple and at the means of distributing that work to the user," Efron said. "One of the things we found was that the less-expensive programs—no matter how worthy—often were not reaching their markets. We look at the *Disk Magazine* as one way for small programs—works that might not otherwise achieve commercial success—to be packaged together, duplicated, and distributed as a unit," he said. "We can all share the tremendous costs of production.

"This way the product is out there, and the author can make some money,"

▶ **The product, as its name implies, uses a magnetic disk instead of ink and paper to convey its message.**

Efron continued. "And the user receives a similar benefit: a collection of programs that is worth more than the sum of its parts."

The magazine will actively seek contributions from readers for upcoming issues. For details concerning submission, send for the "Software Submission Plan," *A+ Disk Magazine*, Author Submission, One Park Avenue, New York, NY 10016. Authors are paid on a per-copy royalty plan, based on sales. "We want our readers also to be our authors," Efron said. "They will determine the content and the success of the magazine."

"The purpose of the *Disk Magazine* is not to supplant *A+* magazine," Efron said, "but rather to complement it.

We'll be able to include long programs that could not be listed in print, and our software will be debugged and ready to go."

Similarly, Efron said, the package will not be in competition in national distribution. "Our programs will complement these packages as well," he said. Efron said he expected such products as VisiCalc templates to be in future editions.

The *Disk Magazine* intends to offer a diverse selection of software in every issue, divided into five software categories: Business, Personal, Education, Utilities, and Games. Plans are to have at least one program in each category in every issue.

Among the features in the March issue, you'll find the following:

• **BUSINESS**

Loan Analyzer: Evaluate alternative fixed-payment mortgage and loan agreements, with or without balloon structures.

Bar Charter: Enter your data, bar captions, and graph title on a preformatted screen.

• **EDUCATION**

Transparent Sort: The quickest way to understand the Shell/Metzner sorting algorithm is to watch it happen step by step. Use an electronic blackboard to view the internal workings of the program at any speed.

Bank It: Designed by educators, this game offers entertaining reinforcement of essential arithmetic skills.

• **GAMES**

Sea Battle: It's a naval engagement on the high seas, and you're Supreme Commander.

Pyramid Match: The computer presents you with ever-larger numbers that you have to repeat. +

PICKING A PROGRAMMING LANGUAGE

Are you a beginning programmer? Here's some background information that will help you choose a language.

Have you been buying software packages for your Apple and wondering whether there is more to computers than what commercial application programs offer? Have you ever considered what it might be like to try writing your own programs? After all, people who write their own programs, even very small ones, get a good deal of satisfaction from meeting the challenge of doing so. If you are ready to try programming, though, you'll have to choose a programming language—BASIC, Logo, perhaps Pascal?

Obviously, you need some basis on which to decide. Not all languages are suited for all people or all purposes, which may account for the number of different languages. To guide you in your choice, this article will present the

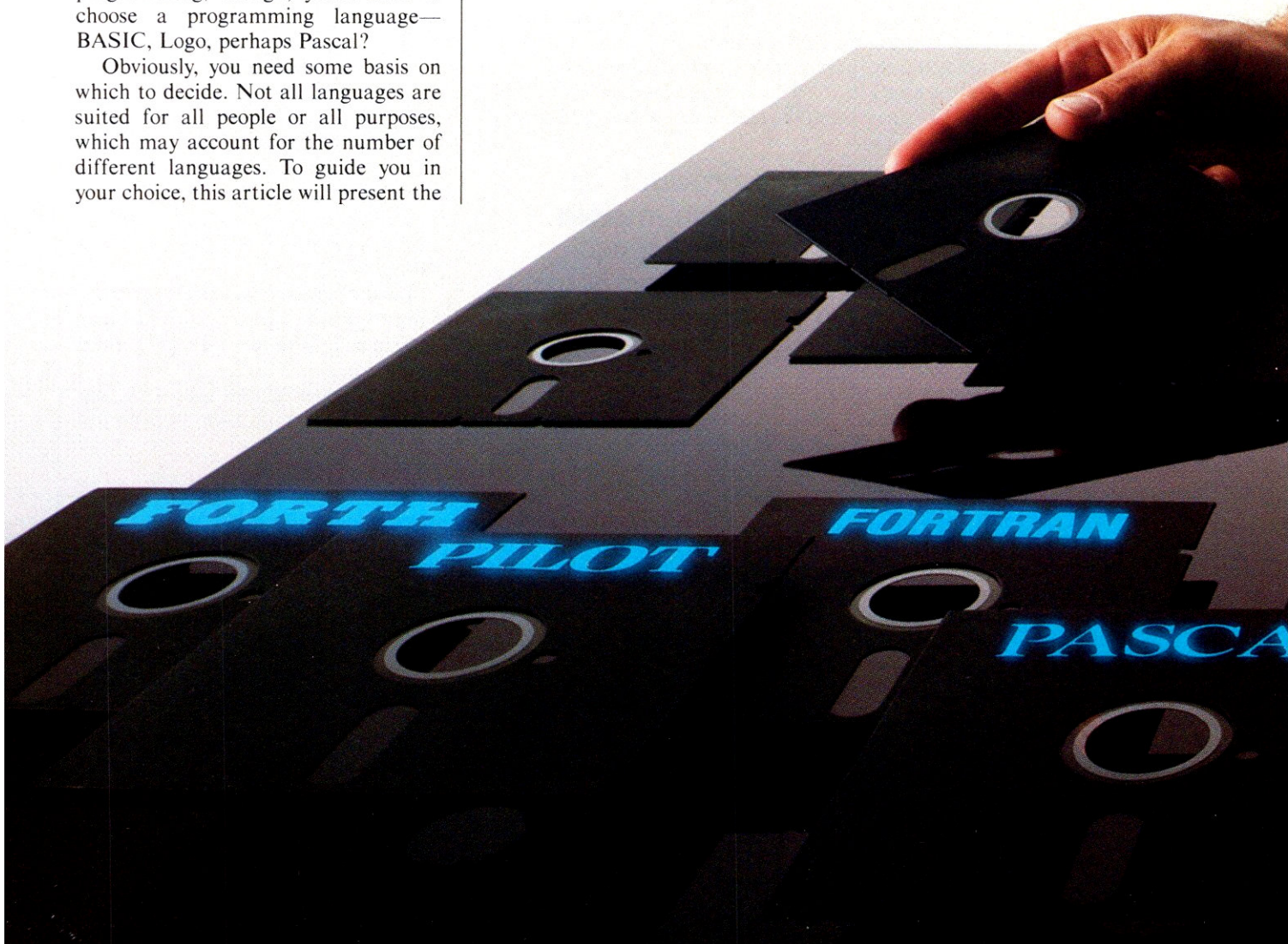
strengths and weaknesses of each of the major programming languages for microcomputers.

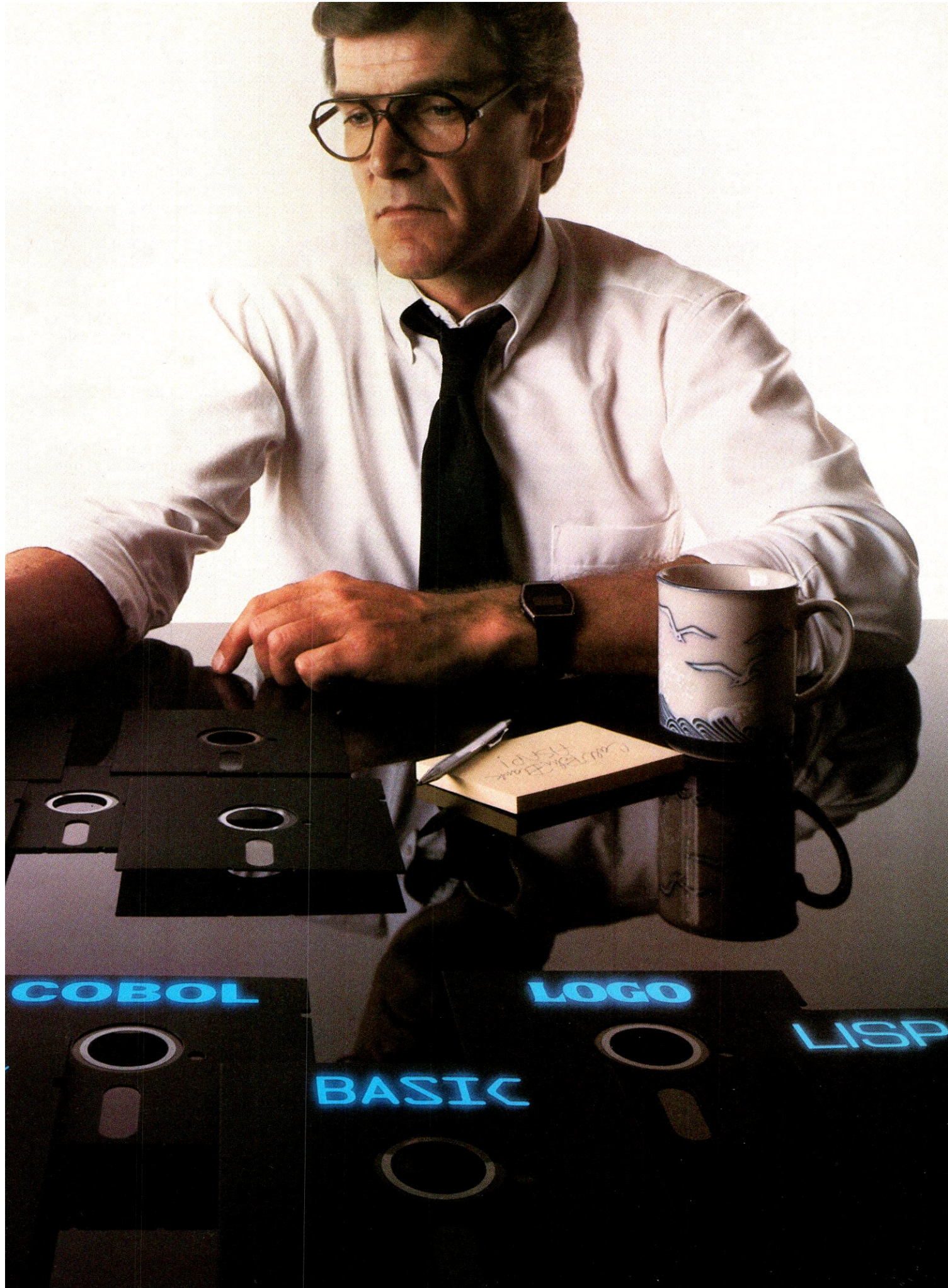
BASIC Is Basic

Probably the most popular programming language for beginners and hobbyists is BASIC, which is an acronym for Beginner's All-Purpose Symbolic Instruction Code. It was invented around 1964 by then Dartmouth professors John G. Kemeny and Thomas Kurtz to allow novices, particularly their students, to try their hand at programming without getting overly involved with syntax and format. You can get your feet wet without first having to

fuss about the different types of variables (integer, floating-point, string), forms of output (e.g., the number of digits in numerical answers), and the like.

BASIC is almost universal, since almost all microcomputers come equipped with some version (often called a dialect) of it. It uses familiar symbols, most notably the English alphabet and the ten digits 0 through 9, and most dialects have respectable graphics capabilities. Many of the commands use suggestively familiar state-





COBOL

LOGO

LISP

BASIC

ments, words, and commands, such as PRINT, LIST, and IF... THEN... You type in each line of code for the program on a line that you number, and the computer executes the program following the order of the line numbers, unless you direct it otherwise.

If one of the strengths of BASIC is the relative ease of learning it—coupled with its ready availability—then one of its disadvantages is the lack of structure of many dialects. Critics say

BASIC is almost universal, since almost all microcomputers come equipped with some version (often called a dialect) of it.

that most versions of this language actually encourage sloppy programming style, which in turn makes such programs harder for others to follow or debug (locate errors). Despite this criticism, BASIC is the de facto standard language for micros, and, hence, it is frequently the language that users of Apples and other personal computers learn first.

Since computers that are programmed in BASIC have to convert typed-in programs to machine language—either binary or hexadecimal numbers—BASIC is called an interpreted language. As with other such interpreted or “high-level” languages, BASIC programs tend to run relatively slowly. For most beginners, however, BASIC’s speed is more than adequate. Furthermore, BASIC compilers, software that converts (“compiles”) your code to machine language before you run it, can speed up your programs.

Do not expect a BASIC program you write on an Apple to run on another brand of computer. To convert your programs, you have to know the idiosyncrasies of each machine and which commands are comparable. Converting small programs isn’t a big problem, however.

Who Likes Logo?

Logo is another language that is easy to learn, and many consider it a better tool for children—and even for adults—than BASIC. This ease of learning is the main reason why Logo, invented in the 1970s, has become so

popular in elementary school—with both the kids and the teachers. Many people identify Logo by its “turtle” cursor, which children learn to move around the screen of their monitor.

Dr. Lawrence B. Golden, Associate Professor of Physics at Pennsylvania State University and an experienced computerist, even recommends Logo as a first language for adults, in preference to BASIC. With all computer languages, he explains, the most important consideration is the learning of algorithms, procedures to solve problems or reach goals. With Logo you can focus on algorithms without getting involved with much else. The language is structured yet easy to learn, and it provides quick positive reinforcement. Like BASIC, it is on the slower side and not well suited for complex calculations.

Machine Language or Assembly Language

Computers do not operate in the realm of words, but rather in that of numbers—in either binary or hexadecimal form. Machine language, which uses these numbers for programming, is the natural language of the computer. Working in machine language is very difficult, too difficult for most novices.

Assembly language is a language of mnemonics—memory devices—for machine language. It is easier to learn than machine language, but beginners should avoid it.

Why would anybody learn or use assembly language instead of something simpler? The reason is speed. As a low-level language close to the natural language of the machine, assembly language executes quickly. This asset makes it the language of choice for some arcade games, word-processing programs, and database programs. Some programmers prefer to write in a high-level language such as BASIC or Pascal, however, and then use a compiler to convert their programs to machine code. Compiled programs tend to be harder to modify than uncompiled ones, which is why not all high-level-language programs are compiled.

Parlez-vous Pascal?

Pascal, another high-level language, is popular, particularly at universities, as a first language, mostly because it is a structured language. That is, Pascal programs consist of smaller subprograms. Programming instructors use Pascal to teach good programming techniques, and its structure makes it easier to debug than BASIC. It has a speed advantage over BASIC, although

BASIC is a bit easier to learn. Pascal was created and developed by Nicklaus Wirth around 1970, and he named the language after the great 17th-century French mathematician Blaise Pascal.

Part of the fine structure of Pascal, its requirement that programmers declare variable types at the beginning of each program, facilitates error-spotting. Because it is a fine number cruncher, Pascal is a favorite of scientists, mathematicians, and engineers—it offers greater precision for various mathematical functions than BASIC usually does. Many database and word-processing programs for the Apple—PFS File, for example—are written in this versatile language. Moreover, other languages, such as FORTRAN and COBOL, are compiled with Pascal, and Pascal editors are popular.

Pascal has several major variants, but the UCSD (University of California at San Diego) version is probably the standard for micros.

COBOL—For Businesspeople Only?

COBOL (Common Business-Oriented Language), invented around 1960, is considered best suited for business applications. This reputation stems from its excellence for maintain-

Programming instructors use Pascal to teach good programming techniques, and its structure makes it easier to debug than BASIC.

ing accounting files and the like. COBOL is wordy and, consequently, somewhat difficult. Because of its extensive formatting capabilities—and the attendant detail—and the simple way calculations work—with all the limitations that this simplicity implies—COBOL tends to polarize computer users into lovers and haters of this language. Although COBOL is criticized as archaic, there is little chance that it will die soon. In fact, COBOL programmers are in greater demand than are programmers in any of the other popular languages. Not only is COBOL good for business uses, but all the COBOL programs that are already available perpetuate the language’s ex-

istence. In view of its demands, COBOL is probably not going to be your choice of a programming language unless you plan to write business software. **FORTRAN—for Whom?**

FORTRAN, which dates from the 1950s, stands for Formula Translator. As its name suggests, this language—unlike COBOL, for instance—is well suited to the calculating needs of the scientific and mathematical communities. Like COBOL, FORTRAN has its detractors who consider it a dinosaur. But, as with COBOL, the mass of FORTRAN programs and scientific subroutines that exist means that this language is not about to disappear. FORTRAN offers little in the way of graphics, so if this feature is important to you, you ought to forget it. On the other hand, this language has rich formatting capabilities to generate the kind of output you want, provided you are willing to learn how to do so. Traditionally, it has been the first language university students learn, although Pascal is more in vogue nowadays.

Forth—for You?

Forth is another programming language that claims many adherents and is available for personal computers, including the Apple. It was invented

about 15 years ago, making it one of the newer options. This language is much faster than BASIC, and has been described as a “high-level assembly language” well suited for systems programmers.

▶ **This language's distinction is the control it gives you, particularly in that you can customize the language with your own commands.**

Where Forth really excels—and its raison d'être, at least initially—is its use in controlling electronic and laboratory equipment such as automated movie cameras, portable monitors, and especially telescopes. In fact, it is considered the standard control language for astronomical observatories worldwide. This language's distinction is the control it gives you, particularly in that you can customize the language with your own commands. Forth adherents

are ardent in its promotion, but not many people program in this language. The language is still young, and it could catch on more in the years ahead. One Forth package available for the Apple is called Graforth.

Plus Lots of Others

Since computers have a well-established tradition of number crunching, it is not surprising that many specialty languages shine in this kind of application. Worthy of mention are APL, PL/I, LISP, and muSimp. APL is a terse language with unusual symbols. It is not easy to learn, but you'll find it versatile if you do learn it.

PL/I was invented as an all-purpose language, but it is actually quite specialized.

LISP (from List Processor) and muSimp are associated with artificial intelligence. For instance, programs such as muMath can do symbolic math, such as algebra and calculus (differential and integral). Programs in these languages can work with variables without assigned values, something that BASIC and the other languages we've touched on cannot do.

Ada is a language you will be hearing more about. Named after the 19th-century countess and mathematician

Beat the Street... STOCKCRAFT



TAX STRATEGY
TECHNICAL ANALYSIS
PORTFOLIO MANAGEMENT
OPTIMIZED TRADING STRATEGY

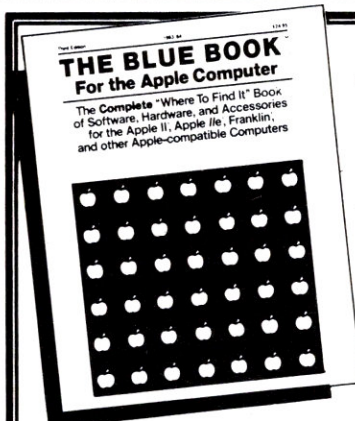
LIMITED TIME OFFER!
>> \$173⁰⁰ <<<
Regular Price \$250⁰⁰

Send For Free Brochure
 Demo Disk is also available \$16⁰⁰

DECISION ECONOMICS, INC.

14 OLD FARM ROAD, DEPT. A+
 CEDAR KNOLLS, NJ 07927 • (201) 539-6889

CIRCLE 124 ON READER SERVICE CARD



APPLE OWNERS!
Look it up in the Blue Book

New Third Edition

- An up-to-date, where-to-find-it Directory for over 4,600 Apple software & hardware products.
- Names & addresses of more than 700 suppliers of Apple software - with detailed descriptions of available programs and how to order them.
- Over 900 pages! An essential reference for every Apple Owner!

PLEASE SEND ME:

___ (copy/copies) of **The Blue Book** @ **\$24.95** each
 ___ free catalog of *Apple instructional books*.

**ADD \$1.50 POSTAGE FOR FIRST BOOK,
 75¢ FOR EACH ADDITIONAL**

Make checks payable to:

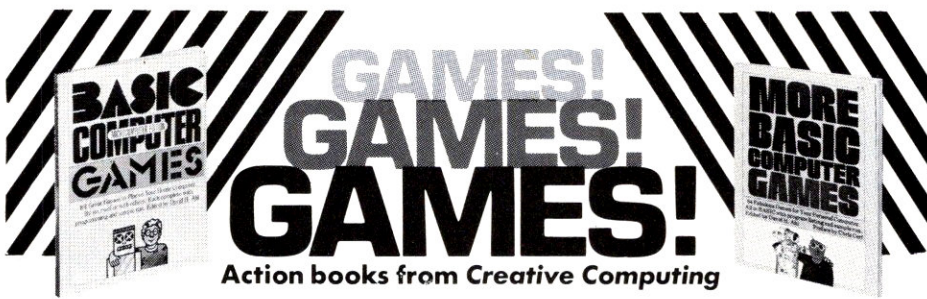
SINEQUANON P.O. Box 235, Cederhurst, N.Y. 11516

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CIRCLE 360 ON READER SERVICE CARD



Basic Computer Games, edited by David Ahl, is a great collection of 101 fascinating game programs, all written in easy-to-use Microsoft® BASIC. Play Craps, Combat, Lunar LEM Rocket, Boxing, Bowling—and 96 others. With introduction, notes on Microsoft BASIC, and conversion table for other BASICs.

More Basic Computer Games, edited by David Ahl and Steve North, is a challenging sequel with 84 exciting new games. Complete with sample runs, program listings and illustrations. All games run in Microsoft BASIC (conversion table included).

More Basic Computer Games also available in TRS-80® edition. Each volume is 8¼" x 11", softcover, illustrated.

Only \$7.95 each!

Registered Trademarks: Microsoft, Microsoft Consumer Products, Inc., TRS-80, Radio Shack Division of Tandy Corp.

For faster service,
PHONE TOLL FREE:
800-631-8112
 (In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.

Creative Computing Press

Dept. NQ4C 39 East Hanover Avenue
 Morris Plains, NJ 07950

Send me _____ **Basic Computer Games** at \$7.95* plus \$1.50 postage and handling each #6C

Send me _____ **More Basic Computer Games** at \$7.95* plus \$1.50 postage and handling each #6C2

Send me _____ **More Basic Computer Games, TRS-80 Edition** at \$7.95* plus \$1.50 postage and handling each #6C4

PAYMENT ENCLOSED \$ _____

*Residents of CA, NJ and NY State add applicable sales tax. Outside USA add \$3.00 per order.

CHARGE MY: (Charge and phone orders \$10 minimum)

American Express MasterCard Visa

Card No. _____ Exp Date _____

Signature _____

Mr/Mrs/Ms _____ (please print full name)

Address _____ Apt _____

City/State/Zip _____

Send me a FREE Creative Computing Catalog.

Ada Lovelace, it is being developed under the auspices of the U.S. Department of Defense. Because of the imprimatur of the DOD, this language will attract programmers, even if only professionally.

C, even more than Forth, produces code that executes rapidly. It is a structured language, frequently coupled with the UNIX Operating System. Many computer professionals think that this one will be a biggie.

PILOT is attracting interest not because of its computational features, one of its weakest areas, but rather because it is good for dialogues and computer-aided instruction, especially with children. Its most typical use is in question-answer situations involving word comparisons.

PROLOG, invented around 1970, merits mention because the Japanese have chosen it as the standard for their "fifth-generation" computers. Its name stands for Programming in Logic. It is

▶ APL is a terse language with unusual symbols. It is not easy to learn, but you'll find it versatile if you do learn it.

not an easy language, and it has some quirks. Still, if the Japanese succeed, it may become a language many of us—or our kids—will be learning.

So Which One Is for Me?

You can see that we have many languages to choose from—some estimate the number at about 200! Which one you should use depends on what you want to accomplish. No language is better than the others in all respects. As a general rule, easier languages, such as BASIC and Logo, probably have certain limitations, such as slowness, that others, such as Pascal, FORTRAN, COBOL, or Forth overcome.

The important point in starting to program is just that—starting. Learn something about programming in general, and not just the specifics of one language. Seek out some introductory books or magazine articles. The satisfaction of solving problems, even very simple ones, makes programming a rewarding task. It may not always be easy, but it will be worth it! **+**

MAXELL.
OUR SEAL OF APPROVAL
ON EVERY DISK.

Call today about our quantity pricing.
 Dealer inquiries invited.

TO YOUR COMPUTER WITH LOVE!

SJB DISTRIBUTORS INC.
 3524 Dividend Drive
 Garland, Texas 75042
 (800) 527-4893
 (800) 442-1048 In Texas

CIRCLE 126 ON READER SERVICE CARD

INCREDIBLY SPREADABLE.

Do spreadsheets faster and easier with complete cursor control on the programmable Iie Tender Keypad.

The Apple Iie* is a nice computer. Until you try to do a ledger, a VisiCalc** spreadsheet...or for that matter, any program that uses numbers. It could take days.

Cursors!

What you need is the Iie Tender. It's the Apple* keypad that gives you cursor control in all directions, as well as four programmable keys which can be permanently defined to any frequently-used key. And redefined at will.

At your fingertips.

You also get the four mathematical functions, a decimal point, comma, space bar and delete key. Plus, the Iie Tender is human engineered to provide you with a sure touch and less user fatigue, and comes standard with Coupler-Calc software to turn it into a fixed or floating-point calculator. It's even color-coordinated to match your Apple.

You can install the Iie Tender—without taking up an expansion slot—in about five minutes. And our interface allows disconnection in seconds without getting inside.

Try one.

Try the incredibly spreadable Iie Tender at your local Apple Dealer today. Or write or call us for more information.



625 Trailwood Court
Garland, TX 75043
(214) 270-0922

Dealer inquiries invited.



Standard, non-programmable models are also available for both the Apple Iie and Apple II+.* Ask your dealer for details.

*Apple Iie, Apple and Apple II+ are registered trademarks of Apple Computers, Inc.

**VisiCalc is a registered trademark of VisiCorp.

CIRCLE 255 ON READER SERVICE CARD

VUFAX

We make apples grow!



NOW THE INFAX 101A SUPPORTS APPLE III, S.O.S. AND APPLE II ProDOS!

THE INFAX 101A, 10 MEGABYTES BIG!

The Infax 101A disk drive subsystem has been designed specifically for Apple* owners interested in added storage.

The Infax 101A features a removable 10 megabyte data cartridge. Your Apple* can have almost infinite storage capacity with the new Infax 101A.

Look at the features the Infax 101A offers: ★ Highest performance, reliability of any removable disk drive. ★ Lowest cost 10 megabyte (formatted) data cartridge. ★ More resistant to shock and vibration than any other fixed or removable disk drive. ★ Fastest start/stop (cartridge replacement) time of any high performance disk drive. ★ Non-contact head to disk interface. ★ Micro-processor-based error correction. ★ User transparent error detection and correction. ★ Automatic start-up diagnostics, idle drive shutdown, error recovery procedures. ★ Host adapter/controller and software supports up to 4 drives simultaneously. ★ Cartridge write protect switch.

The Infax 101A comes with disk drive, data cartridge, power supply, cables and personal computer adapter. Software included supports Apple* DOS 3.3, Pascal and CP/M.** Also included are support software for quick copying, backup and file management. Slot independent. Supports auto-boot capability. Infax is a registered trademark of D² Products. *Apple, Apple III, Apple II ProDOS and S.O.S. are registered trademarks of Apple Computer, Inc. **CP/M is a registered trademark of Digital Research, Inc.



For additional information and the name of the dealer nearest you call (800) 241-1119 — in Georgia call (404) 981-6778. Or write: VUFAX, INC., 5301 Covington Highway, Decatur, Georgia 30035

CIRCLE 135 ON READER SERVICE CARD

A+ MAGAZINE/MAY 1984 ▶149

UNDERWARE

Software that's priced UNDER the competitions'

APPLE PROFESSIONAL

HAYDEN Just for You!

FREE DISK SLEEVE with each purchase!

The Speller	\$37
The Calendar	\$37
The Writer	\$45
The Producer	\$69
Sargon III	\$37

CONTINENTAL

FREE DISK SLEEVE with each purchase!

General Ledger	\$157
Accounts Receivable	\$157
Accounts Payable	\$157
Payroll	\$157
Property Management	\$349
Home Accounting	\$47
First Class Mail	\$60
Tax Advantage	\$47

SUNDEX

Certified Personal Investor	\$79
Certified Personal Accountant	\$79
Personal Payables	\$39

MICROPRO

WordStar	\$289
InfoStar	\$289
RepStar	\$259
ProPack (WordStar, Mail Mge., Spellstr., StarIndex)	\$389

GREAT SAVINGS ON

Monogram Dollars & Sense	\$77
TeleLearning University	\$119
CompuServe Start Kit 5 hrs	\$29
MSI Programmable Spreadsheet	\$69
Sierra HomeWord	\$49

APPLE EDUCATION

SPINNAKER

KidWriter ages 5-12	\$23
Delta Drawing ages 4-up	\$37
Alphabet Zoo ages 3-8	\$23
Hey Diddle ages 3-10	\$23
KinderComp ages 3-8	\$23
Rhymes & Riddles ages 5-9	\$23
Story Machine ages 5-9	\$26
Search Amazing Thing ages 10-up	\$29
Snooper Troops 1 ages 10-up	\$33
Snooper Troops 2 ages 10-up	\$33
Fraction Fever ages 7-up	\$23

AMERICAN EDUCATIONAL COMPUTER

Learn About Sounds (grades K-3)	\$39
Words In Reading I (grades 1-3)	\$39
Words In Reading II (grades 1-3)	\$39
Reading Comprehension I (grades 1-4)	\$37
Reading Comprehension II (grades 3-7)	\$37
Reading Comprehension III (grades 6-8)	\$37
Vocabulary Word Builder (grades 2-8)	\$29
Grammar Word Skill (grades 2-8)	\$29
U.S. Geography Facts (grades 2-8)	\$29
World Geography (grades 2-8)	\$29
Spanish Vocabulary (grades 2-8)	\$29

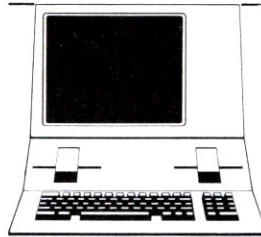
CBS SOFTWARE

Success with Math Series	
Addition-Subtraction	\$19
Multiplication-Division	\$19
Linear Equations	\$19
Quadratic Equations	\$19
Mastering the SAT	\$99

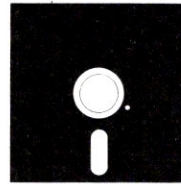
HAYDEN

Ages 4-10

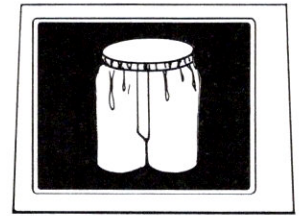
MicroAddition (D&C)	\$20
MicroSubtraction (D&C)	\$20
MicroDivision (D&C)	\$20
MicroMultiplication (D&C)	\$20
Monkey See-Spell (D&C)	\$20



HARDWARE



SOFTWARE



UNDERWARE

SCOTT FORESMAN For You!

Probe Primary	\$29
Probe Intermediate	\$29
Probe Jr. H.S.	\$29
Probe H.S.-adult	\$29

DESIGNWARE

Spellagraph	\$29
Trap A Zoid	\$29
Creature Creator	\$29
Spellicopter	\$29

APPLE ENTERTAINMENT

Hayden Sargon 2	\$27
Hayden Sargon 3	\$37
Epyx Temple Apshai	\$28
Epyx Jumpman	\$25
Epyx Oil Barons	\$39
Sega Star Trek	\$33
Sega Buck Rogers	\$33
Sega Congo Bongo	\$33
SubLogic Flight Simulator	\$27
InfoCom Zork 1, 2, 3	each \$26

PERIPHERALS

MONITORS For You!

BMC 13" Composite Color Plus	\$239
Amdek Color I	\$287
USI 14" Color	\$279
USI 12" Green Hi-Hi Res	\$129
USI 12" Amber Hi-Hi Res	\$139
TAXAN 12" Green	\$99
TAXAN 12" Amber	\$109
TAXAN 13" RGB Color	\$499
NEC JC 1216 RGB	\$419
NEC JB 1205 Amber	\$155

DISK DRIVES

RANA Elite 1	\$249
RANA Elite 2	\$385
RANA Elite 3	\$495
Controller with above	\$77

CONCORDE

Full High SS-SD 163K	\$239
Half High SS-SD 163K	\$249
Full High DD-DD 326K	\$339
Full High DS-DD 326K	\$339
Half High DS-DD 326K	\$359

MODEMS

NOVATION

Smart Cat 103-212 1200	\$415
212 Auto Cat	\$575
Cat	\$137
D-Cat	\$155
J-Cat	\$119
Apple Cat II (300 baud)	\$199
212 Apple Cat (1200 baud)	\$549

ANCHOR MODEMS For You!

With Power & Cable

Mark 7 300 baud	\$129
Mark 12 300-1200 baud	\$319
Volkmodem 300 baud	\$79

PRINTERS

NEC 8023A	\$379
NEC 8025	\$669
STAR GEMINI 10X	\$287
Okidata 82A	\$389
Okidata 83A	\$589
Transtar 1315 Color	\$489

GRAPHICS TABLET

CHALKBOARD POWERPAD (with Apple Start Kit) .. \$119

SOFTWARE PACKAGES

Leonardo Logo	\$39
Leo's Links	\$27
Programmers Kit	\$19
BearJam	\$25
KOALAPAD Apple	\$85

BOARDS & BUFFERS

PRACTICAL PERIPHERALS

Printerface	\$59
GraphiCard	\$79
MicroBuffer II- 16K	\$189
MicroBuffer II- 32K	\$219

JOYSTICKS ET AL

Apple Analog	\$39
Apple Mouse	\$49
Kensington System Saver	\$63

BLANK DISKETTES

MAXELL DISKS

MD1 SS DD Box of Ten	\$27
MD2 DS DD Box of Ten	\$40

VERBATIM

ValuLife SS DD Box of Ten	\$28
ValuLife DS DD Box of Ten	\$42

Such A Deal

12629 N. Tatum Blvd.
Suite 138
Phoenix, AZ 85032

CALL TOLL FREE
1-800-431-8697
602-957-3619

For Customer Service
Call: 602-955-3857

ORDERING & TERMS: Send cashier check, money order, personal/company checks allow 3 weeks bank clearance. VISA/MasterCard accepted. Provide phone number with order. SHIPPING: Software add \$4.00 for first piece, add \$1.00 each additional piece. Hardware add 3% or \$10.00 whichever is greater. Returns must have authorization number (call 602-958-9128 for authorization number). All returned merchandise subject to restocking fee and must come with all original packaging. No returns allowed after 30 days from shipping date. Prices are for cash. VISA and MasterCard add 3%. Prices subject to change without notice. All products subject to availability from manufacturers and/or suppliers. All prices in U.S. dollars. We pay shipping on backorders.

A+ PROGRAMMING CONTEST

WIN
A \$500 monthly prize
A \$1000 yearly grand prize

Here's your chance to have your software masterpiece published in a national magazine and win some cash too!

The rules are simple:

- Send us your program on a diskette and be sure to label the diskette with your name and address so we can return it. Also tell us what operating system and language you used and any special hardware requirements.
- Include a listing and an explanation of what the program does and how it works.
- You can write in any computer language for any Apple-family computer. Programs must be no more than 200 lines (4 pages) long and must be complete and bug-free.
- We'll pick winning programs based on a combination of usefulness, entertainment value, clarity of presentation, and/or topic. Rulings will reflect our personal preferences.
- We'll pay \$500 for the right to publish your program and \$1000 for the best program of the year. You must certify that your program is original and has not been published or distributed anywhere else.

• **Mail your entries to: A+**

11 Davis Drive
Belmont, CA 94002
Attn: Fred Davis

FOR YOUR APPLE II STOCK-FOLIO™

POWERFUL Software for Experienced and Beginning Investors.

EASY-TO-USE.

An 8th Grader can run STOCK-FOLIO!

Maintains Stock Price and Volume Data.
Hi-Res Data Bar Graphs.

Multiple Moving Averages, Relative Strength,
and Price Momentum for Trend-Spotting and
Decision-Making.

Manages Buy, Sell, Dividend, and Cash
Account Records. Summary Reports.

No Modem Needed. Quick Data Entry.

ONLY \$79.50 . . . Ask Your Dealer, or Order
Direct. We Accept VISA or MasterCard.
We'll Pay the Shipping.

FREE LITERATURE • CALL or WRITE
MICRO PROGRAM DESIGNS

5440 Crestline Road • Wilmington, DE 19808
Phone (302) 738-3798

CIRCLE 380 ON READER SERVICE CARD

FREE? DISKETTES

SAVE MONEY! Apple II+/e users can use the disk flipside, if another 'enable' notch is safely made.

The **DISK-NOTCHER** by **QUORUM** quickly **SOLVES** that **PROBLEM**.

It's like **FREE DISKETTES!**

- Stainless Steel Guide
- Easy Leverage Handle
- Clippings Catcher
- Square Notch Cut
- Black Finish
- Get THE BEST!



Certifix™

BE SAFE! Your 'FREE' disk is **CERTIFIED 100% ERROR FREE** with **CERTIFIX** by **QUORUM**. It **'LOCKS OUT' DISK FLAWS** and lets you use the rest. Displays status report & saves it to disk. Next, **CERTIFIX** automatically formats then offers to initialize with genuine **Apple DOS 3.3** too. Great for testing economy disks. **CERTIFY, FIX, & INITIALIZE every disk with CERTIFIX!**

100% Money Back Satisfaction Guarantee!

DISK NOTCHER is \$14.95 • **CERTIFIX™** is \$24.95
ONLY \$29.95 for BOTH!

Add \$1.50 s/h • CA add 6½% tax

QUORUM INTERNATIONAL, Unltd.
INDUSTRIAL STATION P.O. BOX 2134-A P
OAKLAND, CA 94614

CIRCLE 241 ON READER SERVICE CARD

ADVANCED COMPUTER PRODUCTS

SEND \$2.00 for 1984 CATALOG

64K RAMS Set of 9 \$50.00

IBM PC MULTICARD™

"MULTICARD" multifunction card for the IBM PC & XT expandable to 256K. Thousands of this popular card have already been shipped by ACP.

- 64-256K
- Parallel Port
- Serial Port
- 1 Year Warranty
- Disk Emulator Software
- Printer Spooler Software
- Clock/Calendar
- Clock Software

\$229⁰⁰ w/64K **\$229⁰⁰**

S-100 64K "CMOS" RAMCARD

Unbelievable Price!

\$299⁰⁰

Assembled and Tested

- ACP has sold over 1000 of these IEEE compatible, low-priced, high-reliability 64K Static RAM Cards.
- Single 5-Volt operation.

SIEMEN'S SALE

You can now purchase Shugart compatible 8" Disk Drives below your existing factory direct pricing!

These Prices are the lowest ever published.

***Siemen's SSSD FDD100-8 . . . \$169.00**

Also, with purchase of Disk Drives you can buy the Vista V-1000 Dual Case with Power Supply and Cable for only **\$375.00** . . . Regular Price \$495.00

Offer Limited! Factory Warranty 90 Days! Shipped Immediately from Stock! *DEM Quantities

8" Disk Drives \$169⁰⁰

DOT MATRIX PRINTER

COEX 80-FT

- 9x7 Dot Matrix, 80 CPS, Bi-Directional Printing
- 2K Buffered Memory
- 80, 96, 132 Columns, Graphics and Block Printing
- Selectable Char Pitch, Line Spacing and Feed

COEX Interface Card to Apple . . . \$49.95

\$199⁰⁰

APPLE II™ COMPATIBLE

Thin Line Drive

\$199⁰⁰

APPLE COMPATIBLE DISK DRIVES

VISTA Solo 5 1/4" Std.	\$199.00
CUMANA 5 1/4" Std	219.00
RANA Elite 1	249.00
Elite 2	399.00
Elite 3	499.00
Elite Controller	82.00
SUPER 5 Alps A40 Thinline	199.00
TEAC T40 Thinline	239.00
TEAC T80 Doublesided Controller	329.00
	58.00

TANDON 100-2

PC Compatible • Double Sided

\$229⁰⁰

TM100-1 \$179.00

Mounting Kit for IBM PC \$4.95

TOSHIBA Half-High

PC Compatible • Double Sided

\$179⁰⁰

OTHER DRIVES WE STOCK

TANDON 848-2 Thinline	\$479.00	SHUGART 801R	\$399.00
TEAC FD55B	199.00	QDC Datatrack 8	449.00
SEAGATE 10Mb Hard Disk	699.00	QDC 1800 DS (320K)	249.00
MPI 852	239.00	SEAGATE ST506 (6MB Win.)	499.00

Apple Compatible Software BUSINESS

APPLIED SOFTWARE Versaform	\$299.00
Versaform Hard Disk	399.00
ARTSICK Magic Window II	95.00
Magic Combo	149.00
ASHITA-DATE dBASE II (CP/M)	385.00
Friday (CP/M)	198.00
BPI (GL, AR, AP, Pay, Inv)	ea. 299.00
BRODERBUND Bank Street Writer	49.00
BUSINESS SOLUTIONS The Incred Jack	149.00
CONTINENTAL (GL, AR, AP, Pay)	ea. 189.00
Home Accountant	49.00
DATAMOST Real Estate Inv	99.00
DOW JONES Market Manager	249.00
Market Analyzer	289.00
Market Microscope	549.00
EAGLE Money Decisions	149.00
FOX & GELLER Quickcode	199.00
d Utility	89.00
d Graph	199.00
HAYDEN Pie Writer	99.00
Compiler Plus	79.00
Basic Compiler	45.95
HOWARDSOFT Tax Preparer	149.00
IRS Equity Analyzer	139.00
KENSINGTON Format II	99.00
LIGHTNING Mastertype	35.00
LIVING VIDEOTEXT Think Tank	135.00
MICROPRO Wordstar	249.00
Maintenance or Spellstar	139.00
Wordstar Prof. 4 Pak	449.00
Info Pak or InfoStar	Call
MICROSOFT Multiplan	179.00
Multitool Financial	79.00
Multitool Budget	119.00
MEGAHAUS Megawriter	49.00
PEACHTREE Series 40 (GL, AR, AP)	379.00
Series 3 (Text, Spell, Mail)	399.00
PERFECT SOFTWARE	Call
QUARK Word Juggler (Ile)	199.00
Lexichack (Ile)	99.00
Call for Apple III	
SIERRA ONE	
Screenwriter II	99.00
Screenwriter Professional	149.00
General Manager II	169.00
Dictionary	79.00
SOFTWARE PUBLISHING PFS:File	89.00
PFS:Graph or PFS:Report	89.00
STATE OF THE ART	Call
STONEWARE DB Master 4.0	249.00
BB Utility 1 or 2	79.00
SYSTEMS PLUS Act Plus (GL, AP, AR) Set	599.00
VISICORP Visicalc 3.3	179.00
Visicalc Enhanced	199.00
Visilite or Visilink	179.00
HOME & EDUCATION	
BRODERBUND Chopflier	\$28.00
Drol or Lodenur	28.00
Arcade Machine	44.00
Apple Panic	24.00
BUDGECO Raster Builder	21.00
Pinball Construction Set	29.00
COUNTERPOINT SOFTWARE	
Easy Games for Young Children	26.00
DATAMOST Aztec	29.00
Pig Pen or Shark Attack	23.00
DATASOFT Zaxxon	21.00
EDU-WARE Compumath	37.00
Algebra I, II or III	30.00
Compuared or Compusspell	23.00
EINSTEIN Memory Trainer	73.00
ELETT ARTS Music Construction	Call
HARCOURT Computer SAT	Call
HAYDEN Sargon II	29.00
INFOCOM Zork I, II or III	29.00
Deadline	36.00
KOALA Modules (8 available)	Call
LEARNING COMPANY	
Juggles Rainbow	36.00
Bumble Games	48.00
Gertrude's Secrets	59.00
L & S Crossword Magic	41.00
MICROFUN Miner 2049er	Call
MICROLAB	Call
MICROSOFT Decathlon	29.00
Typing Tutor II	19.00
MONOGRAM Dollars & Sense	74.95
ORIGIN Exodus: Ultima III	41.95
PENQUIN The Quest	16.00
SENSIBLE Sensible Speller	99.00
SIERRA ONLINE	
SIRTECH Legacy of Lyliamaya	29.00
Knight of Diamonds	29.00
SOUTHEASTERN Data Capture 4.0	54.95
SPINNAKER Alphabet Zoo	20.00
Delta Drawing	35.00
Fracture Fever	22.00
Kindercomp	21.00
Facemaker	28.00
SUBLOGIC Flight Simulator or Pinball	26.00
SUNDEX No. 1 Rated Home Finance	
CPA Personal Accountant	74.95
CPA Personal Investor	42.95
Personal Logo	\$99.00
TERRAIN Pays	75.00
TRANSSEND Transend I	29.00
VIRTUAL Micro Cookbook	29.00
UTILITIES SYSTEM	
Beagle Apple Mechanics	\$23.00
Apple Plot or Pronto DOS	26.00
Beagle Basic	26.00
DOS Boss	17.00
Double Take or Utility City	26.00
CENTRAL Point File	16.00
Copy II Plus	17.00
LOCKSMITH	79.00
MICROSOFT A.L.D.S.	85.00
Cobol 80	575.00
Fortran 80	155.00
PENQUIN CGS System	79.00
PHOENIX Zoom Graphics	31.00
SOUTHWEST Merit	49.95

Send for Complete Catalog of Software

APPLE™ COMPATIBLE DISK CONTROLLER

Only **\$49⁹⁵**

Apple Compatible Printer Interface

w/Apple to Epson Cable **\$49⁹⁵**

Apple IIe Compatible 80 Column w/64K

\$99⁹⁵

APPLE COOLING FAN

with Surge Suppression **\$49⁹⁵**

VISTA "SOLO"

Apple II/Ile Compatible Disk Drive

Totally compatible to Apple Drives.

Only **\$199⁹⁵**

Controller **\$49.95**

Just plug in and run.

Apple II 16K RAM CARD

Compatible with 280 Softcard™ . PASCAL CP/M™

Full 1 year Warranty. Top Quality by COEX

NEW LOW \$49⁹⁵

ACPI PRICE

Also from COEX, NEW EPSON Parallel Interface for Apple.

With cable **\$49.95**

VISTA A800

8" Disk Controller for Apple **\$299⁹⁵**

VISTA "DISKMASTER"

IBM Compatible 3", 5", 8" and V1200 Compatible **\$169⁹⁵**

MONITORS

TAXAN

MODEL	ACP PRICE
120 RGB Composite, Sound (Apple)	\$329.00
400 RGB Vision I Med. Res. (Apple, IBM, etc.)	329.00
410 RGB Med. Res. (Avail. Mar.) w/10, 10M, IBM	429.00
415 RGB Vision III Res. (Apple w/10, IBM)	559.00
420 RGB III Hi Res. (IBM Cabinet)	559.00
121 TTL Green 12" (IBM Cabinet)	179.00
122 TTL Amber 12" (IBM Cabinet)	189.00
100 105 Green Amber	139.00/149.00

CLEARANCE SALE

(Quantities Limited)

QTY	LIST	ACP
120 Apple III Switching Power Supplies	\$59.95	99.95
13 Zenith Z89X Computer	2199	1149.00
26 Zenith Z90-0 Computer	2499	1299.00
22 Zenith Z37 Disk Drive	1699	899.00
12 Zenith Z87 Disk Drive	999	549.00
1 Zenith Z87 Hard Disk	5995	3199.00

4 All Zenith New in original boxes with 90 day Factory Warranty from nearest dealer.

2 TI 840R0 w/friction	995	579.00
4 TI 840R0 w/fractor	1045	599.00
2 TI 840R0 Package Opt/fractor	1265	699.00
5 TI 840R0 Package Opt/fractor	1315	749.00
7 TI 850 Serial Printer	350	179.00
7 TI Professional Multiplan	350	179.00
20 TI Prof 64K exp to 192K Ramcard	999	549.00
1 Fortune System 10	7995	2995.00
1 Fortune System 20	10990	3995.00
3 Fortune 256K Ramcard	1095	599.00
35 Olivetti M20 Computer	2495	995.00
200 General Terminals CTC RS232	269.00	
40 Zenitec 8003/9003 Terminals	249.00	

apple computer Authorized Dealer

Complete Apple Support Facility
Complete Apple Service Center
We service most Floppy Disk Drives

Apple IIe w/28K, 80 columns \$1195.00
Apple IIe Starter System \$1395.00
Includes: Apple IIe w/64K, 80 Column Card, Monitor II & Disk II w/Controller 399.00
Disk II w/Controller 329.00
Monitor II Green III 179.00
Super Serial Card 189.00
80 Column Text Card w/64K 169.00
Imagewriter Dot Matrix Printer 549.00
Apple Products Available In-store Only

Apple Compatible Hardware

LIST	ACP
ALS CP/M 3.0 Plus Card	\$399.00
Power Control Center P12	99.00
COEX 16K Ram Card	99.00
Parallel Printercard w/Cable	99.00
Apple II Prototype Card	29.00
Apple I Extender Card	29.00
64K Extended 80 Column	199.00
CORVUS Hard Disk Omnitron	Call
EASTSIDE Wildcard (11 + w/64)	89.00
Wildcard 2 (Ile)	119.00
Wildcard Plus (64K in 10 sec)	149.00
FINGERPRINT Epson Enhancer	49.00
GIBSON Light Mod II	249.00
IS PKASO Interface (II/Ile)	199.00
PKASO Interface (III)	199.00
KENSINGTON System Saver	89.95
PC Saver	49.95
KEYTRONICS KB200 II + Keyboard	298.00
KOALA Graphics Pad	125.00
KRAFT Joystick	65.00
Game Paddles	50.00
MCT Speed Demon	295.00
MPC 128K Bubble Memory	875.00
IBM Supr Mod II RF Modulator	69.00
Supr RF Modulator	39.00
MICROPRO 6MHz Appicard + Word	Call
MICROSOFT Z-80 Softcard	395.00
Z-80 Softcard Plus	645.00
Softcard Premium Pak (II +)	695.00
Softcard Premium Pak (Ile)	495.00
MOUNTAIN COMPUTER	
CPS Multifunction	239.00
Music System	395.00
A/D Plus D/A	350.00
MICROTEC Dumping Buf. w/64K	349.00
ORANGE MICRO	
Grappier Plus	175.00
16K Bufferboard	175.00
Grappier Buffered w/16K	245.00
PCPI Appicard w/128K, 6MHz	595.00
8088 Coprocessor	595.00
Appicard w/128K, 4MHz	495.00
PERISOF (All Year Warranty)	
Printerlink II, Printer I/O	99.00
Messenger Univ. Serial I/O	135.00
Timelink Realtime Clock	110.00
Griffin Graphics I/O	175.00
Bufferlink w/16K Buffer	189.00
PRACTICAL PERIPHERALS	
Microbuffer 16K (Epson Parallel)	159.00
Microbuffer 32K (Epson Parallel)	199.00
Microbuffer 16K (Epson Serial)	179.00
Microbuffer 32K (Epson Serial)	219.00
Microbuffer In-line 64K (Parallel)	349.00
Microbuffer In-line 64K (Serial)	349.00
PROMETHEUS Versacard 4 in 1	199.00
QUADRAM Quadlink	680.00
Microfazer 16K (Parallel)	189.00
Microfazer 16K (Serial)	220.00
Microfazer 32K (Parallel)	225.00
SATURN TITAN	
32K Ramcard	219.00
64K Ramcard	349.00
128K Ramcard	499.00
Accelerator II Card	599.00
Neptune 64K + 80	199.00
Neptune 128K + 80	299.00
Neptune 192K + 80	389.00
STREET Echo II (Apple)	149.00
Echo II Serial (In-line)	249.00
SYNETIX Sprite I	149.00
Sprite II	249.00
Supersprite	395.00
Flashcard 144K	449.00
Shardscard 288K	629.00
TG PRODUCTS	
Joystick	59.95
Select-a-port	59.95
Trackball	64.95
Joystick w/Toggle IIe	64.95
VIDEX Videoterm (80)	345.00
Ultraterm (132)	379.00
Enhancer II	149.00
VISTA COMPUTER	
A800 8" Disk Controller	379.00
A500 5 1/4" Disk Controller	99.00
V1200 Amlyn 6.2Mb	1549.00
VOTRAX Type N Talk	259.00
Personal System	395.00

ROBOTS

LIST	ACP
ANDROBOT	\$159.00
Topo w/Speech	Call
Andrewag	95.00
Toposoft (II, Ile)	100.00
Topoteach (II, Ile)	159.00
Topologo	Call
F.R.E.D. (Educational Robot)	349.00
F.R.E.D. Soft (II, Ile)	79.00
RB5X	
RB5X Robot w/8K	1795.00
16K Memory Add-in	125.00
Robot Arm Option	895.00
Voice Option	195.00
Power Pack	94.00
Robot Control Language (II, Ile)	395.00
ZENITH HERO I	2495.00

IBM™ Apple Trademark of Apple Computer
IBM™ IBM Trademark of International Business Machines

TERMS: We accept VISA, MC, MCO, Cashiers and Personal checks. School and Company Rates. We do not charge your card until we ship. Personal checks require drivers license and credit card #. No Surcharge. Add on shipping and handling for UPS. We reserve the right to substitute manufacturer. We are not responsible for typographical errors. Retail Sale Prices May Vary.

TOLL FREE **800-854-8230**

Mail Order: P.O. Box 17329 Irvine, CA 92713
Retail: 1310B E. Edinger, Santa Ana, CA 92705
(714) 558-8813
542 W. Trimble, San Jose, CA 95131
(408) 946-7010

H O W T O

dBASE II

P A R T V I I

**In a tutorial series on dBase II, a popular
program for database management**

W

elcome to our ongoing series of tutorials on the increasingly popular microcomputer-data-management tool dBASE II. If you have been following along through the last six installments in *A+*, you should now be fairly adept in many of the rudimentary as well as some of the more complex techniques for creating databases, storing information in them, and keeping that information up-to-date. We've also covered most of the approaches for data retrieval, including the use of the sorted and indexed databases, character-string searches, and the various types of "operators" that can greatly enhance your ability to extract from a database precisely the information you need.

This time, we will experiment with the application, creation, and modification of "memory variables." You will also get a chance to investigate the Count command.

Tutorial Conventions

These tutorials contain many examples. Sometimes I ask you to type in a command, and then dBASE II responds. Just to differentiate between what you do and what dBASE II responds with, the lowercase words are the ones you type. Uppercase will still work, so it doesn't really make a difference; it's just clearer this way. Some examples may specifi-

cally ask you to type in uppercase, but such cases always involve a series of words between quotation marks. The dBASE II responses are usually in uppercase letters. All screen interactions are listed in a different typeface to distinguish them from the text. To make these sections more readable, we imply carriage returns, rather than including them here.

In the command-syntax examples, words between square brackets (e.g., [before]) indicate an optional phrase or "argument."

Memory Variables

Ever use a pocket calculator that had a memory? Such a device allows you to store a number until you need to use it for a later calculation or reference. It's helpful when you want to use the same number over and over. Some calculators even have two or more registers (storage areas) for temporarily remembering numbers.

dBASE II has the same feature, but with it you can have as many as 64 memory spaces active at one time. Also, you're not limited to storing only numbers in them. You can also store words, letters, and logical (yes/no) information. So, what does this ability mean to the average dBASE II user? Two things: more flexibility when you use dBASE II to look at and modify databases and the option of running

programs that can perform complicated and/or repetitive tasks for you automatically. Without these memory spaces, called "memory variables," creating programs is next to impossible. Even though a discussion and series of tutorial articles on programming in *A+* is down the line a way, you will find knowledge of memory-variable usage to be valuable now. Why? Because you can create and use memory variables in the Keyboard Input Command mode, as well as under program control.

Incidentally, dBASE has two basic categories of variables, memory variables and field variables. You are already familiar with field variables—they are the blank spaces in your database records into which you type information. Memory variables and field variables are similar, except that your database stores only field variables. Through the use of dBASE commands, you can modify or even interchange field and memory variables, but you must take care not to assign an existing field name to a memory variable, or dBASE will confuse the two.

So, why the term *variable*? Any temporary storage area whose contents can be altered is called a *variable* (for obvious reasons) as opposed to a *constant*. The name Jimmy, which you might type into the First:Name field in a database is a variable because the name might be Harold in the next record. In contrast, the value of pi (3.14...) is a constant, in that it never changes. You could, however, store 3.14 in a variable called "number" (for example). A variable is just a pigeonhole in which you can store data, including constants.

You can modify or even interchange field and memory variables, but you must take care not to assign an existing field name to a memory variable, or dBASE will confuse the two.

Before getting into the details, let's consider why you might want to use memory variables. Say you have a name-and-address file and you want one field in this file to contain a unique number for each person. You could type this number in manually for each person or use a memory variable and the Replace command to do this for you. You would store the beginning number of the series in a memory variable and replace the field variable in the first record with this number. Then you could tell dBASE to increment (add 1 to) the memory variable, skip+1 (move to the next record), write the new memory-variable number into that record, and so on. This procedure is just one of the many possibilities the use of memory variables creates. Now here are some of the details:

The rules of the game are as follows: dBASE allows 64 simultaneous memory variables, each with a maximum length of 254 characters. The total combined character count of all active variables may not exceed 1536. Variable names may be up to ten characters long and may include numbers and colons but no spaces (same format as field names).

As always, learning by experience is most efficient, so try these commands:

```
. store 3 to X
3
. ? X
3
. store 'Hello There' to Y
Hello There
. ? Y
Hello There
. store 4 to z
4
. store 456.034 to mem1
456.034
. ? mem1
456.034
. display memory
X          (N)    3
Y          (C)  Hello There
Z          (N)    4
MEM1      (N)  456.034
** TOTAL **    04 VARIABLES USED  00033  BYTES
USED
```

Getting a little thick for you? Don't worry. Actually it's very simple. All you did was tell dBASE to store a number or word in a memory variable. The memory variable did not exist before you stored the information in it. dBASE created it for you and also gave it the name you chose. Store 3 to X literally means "put the number 3 into a slot that I want you to call X."

Unless you issue the Set Talk Off command before this process, dBASE will echo the value to the screen as it stores the value away. The ? commands, as you may recall, simply mean "what is the current value of..." The Display Memory command lists out all the current memory variables, their contents, and their types. These are the same abbreviations you use to characterize fields when you create a database (C,N, and L). As with fields in a database, we can also create logical variables:

```
. store T to X
.T.
. store F to Y
.F.
. store Y to Z
.T.
. store N to A
.F.
. display memory
X          (L)   .T.
Y          (L)   .F.
Z          (L)   .F.
A          (L)   .F.
** TOTAL **    04 VARIABLES USED  00008  BYTES
USED
```

Well, this doesn't make sense, does it? Why did storing Y to Z result in .T. being placed there? The answer is that, unless you enclose a letter in quotation marks, dBASE assumes you are trying to create a logical memory variable. Logical variables can have only two different states, Yes or No. For convenience, dBASE allows True/False to work too, with the same results. Therefore, Y is the same as T, and N the same as F. Any other letter causes confusion:


```

. store L to A
*** SYNTAX ERROR ***
?
store L to A
CORRECT AND RETRY (Y/N) ? Y
CHANGE FROM :L
CHANGE TO : 'L'
store 'L' to A
MORE CORRECTIONS (Y/N)? N
L
. store 'A' to B
A
. store A+B to D
LA
. store A+'.'+B+'.' to D
L.A.
. display memory

A      (C)  L
B      (C)  A
C      (C)  LA
D      (C)  L.A.
** TOTAL **   04 VARIABLES USED  00012  BYTES
USED

```

When you place the L in quotation marks, dBASE assumes you want to store letters or words in the memory variable, resulting in a “string” variable, a variable without special mathematical or logical value. String variables can include any printable characters, including numbers. Notice that you can combine two string variables to form a third one using the + sign. This process is called “concatena-

Once you have some memory variables ferreted away, you can instruct dBASE to do things with them or even modify your databases with them or based on them.

tion.” In the last example above, we concatenated some periods in order to create L.A. out of L and A.

You can use the plus sign, as well as the other arithmetic operators (–, *, and /) to manipulate numerical memory variables:

```

. set talk off
. store 3 to x
. store 5 to y
. store ((x+y)-(y-x))/3 * 8 to z
. ? z
.
19

```

Once you have some memory variables ferreted away, you can instruct dBASE to do things with them or even modify your databases with them or based on them. Suppose you forgot to include the state sales tax in the Cost field of the following file. You could rectify your oversight by using the following commands.

```

. use camplst
. display structure
STRUCTURE FOR FILE: A:CAMPLIST.DBF
NUMBER OF RECORDS: 00007
DATE OF LAST UPDATE: 00/00/00
PRIMARY USE DATABASE
FLD      NAME      TYPE  WIDTH  DEC
001      Item      C     010
002      Weight    N     002
003      Cost      N     005    002
004      Owner     C     010

. list
00001  BACKPACK      10     65.00  KARL
00002  CANTEEN      3      12.50  FRED
00003  FLASHLIGHT    5      15.00  CECI
00004  FOOD          30     45.27  GROUP
00005  RAINGEAR      7      12.95  VALERIE
00006  STOVE         25     85.00  KARL
00007  TENT          12     62.33  LISA B.

. store .065 to x
. goto top
. replace next 7 cost with cost+(cost*x)
00007 REPLACEMENT(S)

```

```

. list
00001  BACKPACK      10     69.22  KARL
00002  CANTEEN      3      13.31  FRED
00003  FLASHLIGHT    5      15.97  CECI
00004  FOOD          30     45.01  GROUP
00005  RAINGEAR      7      13.79  VALERIE
00006  STOVE         25     90.52  KARL
00007  TENT          12     66.38  LISA B.

```

Mixing Variable “Types”

An important caveat is that you cannot mix variables of different types. If you try to concatenate a character string to a number, you’ll get a syntax error. Multiplying a number by a logical variable causes the same result:

```

. store 6 to y
. store 'mailing' to program
. display memory

Y      (N)  6
PROGRAM (C)  mailing

```

```

. store y+program to newvar
*** SYNTAX ERROR ***
?
store y+program to newvar
CORRECT AND RETRY (Y/N)? N

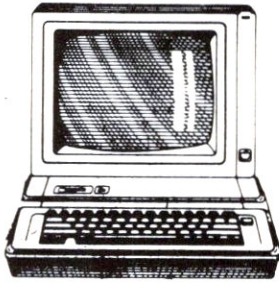
```

Macro Substitution

In most cases, you can refer to the contents of variables just by using the variable name. The arithmetic additions we performed above are typical examples.

Sometimes, however, you’ll find it necessary, or at least convenient, to refer indirectly to a series of letters stored in a variable. Say you want to perform a complicated procedure repeatedly. You could type in the command from the keyboard each time, or you could use the & symbol for a “mac-

THE BYTE GENERAL



3 Sierks Lane • Roslyn Harbor NY 11576

24 Hour Order Line: 516-625-0920

Technical Questions 516-484-6391
and Order Status:



Monitors:

Amdek Color I +	\$289.00
Amdek Color II + 13" High Res RGB	\$425.00
Amdek Color III 13" Med Res RGB	\$350.00
Amdek Video-300 Green	\$129.00
Amdek Video-300 Amber	\$150.00
Sakata Color Monitor Med Res	\$269.00
Taxan 12" Amber	\$109.95

Printers:

C. Itoh Prowriter 8510ap	\$340.00
C. Itoh Prowriter 1550	\$639.00
C. Itoh F-10 40cps Daisy Wheel	\$1125.00
C. Itoh Tractor Feed	\$199.00
C. Itoh Cut Sheet Feeder	\$450.00
Gorilla Banana Printer 30cps	\$199.00
Epson FX-80 160cps	\$520.00
Epson FX-100 15" Carriage	\$725.00
Gemini 10X	\$269.00
Okidata 92ml 160cps	\$425.00
Okidata 93ml 200cps (15" Carr)	\$725.00
Printer Paper 9 1/2 x 11	\$ 28.95
Cables for Above Printers	\$ 26.00

Modems:

Hayes 1200B Smartmodem IBM	\$389.95
Novation J-Cat	\$100.00
Novation Apple Cat II	\$250.00
Novation Smartcat 300/1200	\$400.00
Novation Apple Cat 212 System	\$525.00
Prometheus 1200	\$359.00
Signalman Mark I	\$ 75.00
Signalman 300/1200	\$255.00

Apple Disk Drives:

Apple Disk Controller Card	\$ 55.00
Rana Elite I Disk Drive	\$255.00
Shugart 40trk Apple Disk Drive	\$199.95
Slimline 40trk (Direct Drive)	\$199.95
Slimline 40trk (Belt Driven)	\$199.95

SPECIALS OF THE MONTH:

Elephant #1, SS/SD Soft	\$ 15.95
Elephant #2, SS/DD Soft	\$ 18.95
Elephant #5, DS/DD Soft	\$ 25.95
Elephant 5 1/4" Trunk	\$ 20.00
EMS Secrets of Memory	\$ 2.00

MPC 80 Col. Extended 64K	\$109.95
Hayes Smartmodem 300	\$199.99
Hayes Smartmodem 1200	\$469.00

Kraft Joystick	\$ 34.95
Koala Pad (Apple)	\$ 78.00

! NEW ! Micromodem IIe \$229.95

Operates on all
Apples

Includes:
Smartcom I Software
Free subscription
to the Source



Apple IIe Starter System Only \$1295.00

Includes:
Apple IIe 64K
Apple Green Monitor II
Apple Disk Drive w/Controller
80 Column Card
Tutorial Diskette



Extended 64K
Add only \$100.00



Fans/Surge Protectors:

Kensington System Saver Fan	\$ 65.00
Cool-Time Fan w/2 Outlets/Surge	\$ 35.00
Lemon Surge Protector	\$ 45.00
6 Outlet Surge Protector	\$ 29.00

CP/M Cards:

ALS CP/M Card	\$279.00
ALS ZCard II	\$120.00
CP/M Card (Clone Card)	\$ 79.00
Microsoft Softcard	\$225.00

Ram Cards:

Microsoft 16K Ram Card	\$ 65.00
Microsoft 256K Ram Card	\$365.00
16K Ram Card	\$ 55.00
Titan 128K Ram Card	\$350.00
Titan 128K + 80 Column (Apple IIe)	\$285.00
Titan 192K + 80 Column (Apple IIe)	\$365.00

80 Column Cards:

Smart Term II	\$129.95
Videx 80 Column Card	\$179.95
Videx 80 Column Combo Pack	\$209.00
Videx Ultraterm (160 Col. Card)	\$249.95

Printer/Modem Cards:

MPC Parallel Printer Card/Cable	\$ 55.00
Orange Micro Grappler Plus	\$115.00
Orange Micro Buffered Grappler	\$175.00

Apple Accessories:

CCS Clock Board	\$ 89.95
Thunderclock	\$ CALL
Wildcard I	\$ 90.00
Wildcard Plus	\$145.00

Terms for Sale: Master Card Or Visa Add 3% Service Chg. C.O.D. Orders only accepted on orders over \$100. with a 10% Deposit on a Credit Card, No Exceptions!!!! All Purchase Orders Must Include Prepayment. Minimum Order \$20. APO/FPO or U.S. Mail Service please add \$5. Upon receipt of a certified check or money order we ship the same day. All others please allow 10 business days for bank clearance. There is no sales tax on out of state shipments. New York State Residents please add 8.25% Sales Tax. All orders returned, refused or ordered in error are subject to a 10% restocking charge. Prices are subject to change without notice.



DEALER INQUIRIES INVITED
CIRCLE 305 ON READER SERVICE CARD


```

. display      memory
M1             (N)             10
M2             (N)             20
M3             (N)             30
M4             (N)             40
W1             (C)             Don't
W2             (C)             Worry
W3             (C)             Be
W4             (C)             Happy

. release all like m*
. display      memory
W1             (C)             Don't
W2             (C)             Worry
W3             (C)             Be
W4             (C)             Happy

. release all except ?4
. disp memo
W4             (C)             Happy
** TOTAL **    02 VARIABLES USED 000 13 BYTES
USED

```

Say you have laboriously created a list of variables that you would like to use on a regular basis or that a program uses for reference. You can avoid having to create them each time you enter dBASE; just use the Save and Restore commands. Typing:

```

. save to varlist
. restore from varlist

```

tells dBASE to save all the current memory variables in a file called VARLIST.MEM. Restore performs the reverse procedure—it clears out all existing variables in memory (as

if you'd issued the Release All command) and then loads the variables that you stored in VARLIST.MEM back into your computer. As with the Release command, Save allows the use of the All Like and All Except phrases, in case you want to specify only a subset of your variables. Including the word *additive* tells dBASE not to release any currently active variables when it loads new ones from the disk file:

```

M1             (N)             10
M2             (N)             20
M3             (N)             30
M4             (N)             40
W1             (C)             Don't
W2             (C)             Worry
W3             (C)             Be
W4             (C)             Happy
** TOTAL **    08 VARIABLES USED 00049 BYTES
USED

```

```

. save to varlist
. release all
. store 365 to days
. restore from varlist additive
. display memory

```

```

DAYS           (N)             365
M1             (N)             10
M2             (N)             20
M3             (N)             30
M4             (N)             40
W1             (C)             Don't
W2             (C)             Worry
W3             (C)             Be
W4             (C)             Happy

```

NOW... APPLE IMAGEWRITER* COMPATIBLE!

From Screen to Paper at the Touch of a Button

Textprint is the ONLY way to get fast, easy printouts of ANY screen, at ANY time, with ANY program - in color and black & white.

Push the red button that comes with PRINT-IT!™ - Your program pauses instantly; touch RETURN and whatever is on your screen - text, graphics or both - is printed in color or black & white.

Whether your Apple II, II+, //e or "look-alike" is for business or pleasure, you'll want the ability to pause and take snapshots of your screen displays and then continue from exactly where you paused, all at the touch of a button - games, business data, menus, educational instructions, graphics - even CP/M** - PRINT-IT!™ will print your screen at any time no matter what program you're running, as well as perform every function you expect of an intelligent printer card.

PRINT-IT!™ supports:

- Graphics - Low, high, double low, and double high resolution
- Text - 40 column as well as Apple //e and Videx*** 80 column cards
- Printers - All of the most popular printers, including color, are easily selected with a dip switch

PRINT-IT!™ is available at your local computer store now! If they don't have it in stock, ask them to get it for you.

PRINT-IT!™ is also available for \$199 directly from Textprint with an unconditional money-back guarantee. Just return it in good condition within 30 days of purchase, post-paid, for a full refund. Qualified educational and dealer discounts available.

Textprint's Model 2 (with most PRINT-IT!™ functions, except the push button pause/print feature) is the next best printer interface available anywhere, and for only \$149.

* Apple Computer
 ** Digital Research
 *** Videx, Inc.

TEXPRINT

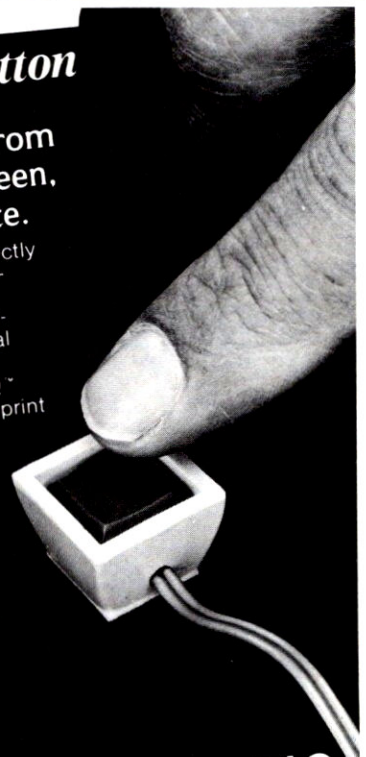
Subsidiary of Computer Products Inc.
 8 Blanchard Road
 Burlington, MA 01803
 Tel. (617) 273-3384

To Order

Call Toll Free 1-800-255-1510



Add \$4 shipping and handling.
 Mass. res. add 5%.



If the brute-force approach appeals to you, the quick-and-dirty technique for acquiring new memory-variable space employs the Clear command. Simply typing `clear` at the dBASE prompt will release all your memory variables—but beware. It will also close all open data files, so don't be alarmed if you type `list` or some other command and you get a `NO DATABASE FILE IN USE, ENTER FILENAME:` message.

Incidentally, another limitation in the area of variable handling is that dBASE does not support the use of memory-variable "arrays," as some other high-level languages, such as BASIC, do. Those of you who are already proficient programmers may find this restriction a nuisance. You can get around this problem, to some extent, by using the `&` symbol to create indirectly referenced quasi arrays. Here is an example:

```
. store 50 to n
. store 'L'+str(n,2) to keeper
. store 'Hello' to &keeper

. display memory
N                (N)                50
KEEPER           (C)                L50
L50              (C)                HELLO
```

By adding 1 to `n` and repeating these commands, we could create any number of variables, with names `L51`, `L52`, `L53`, and so on.

"How Many ... ?"

dBASE users often find themselves wondering just how many records in their databases meet a certain requirement. Say you have a mailing list and are planning to print labels from it. You may need to know the number of mailing labels that you'll get for a specific ZIP code or range of ZIP codes, in order to calculate the number of canvas bulk-mailing sacks to pick up from the post office. Or, using a transaction account, perhaps you'd like to know the number of times a specific customer paid between \$10 and \$25 for an item. The combinations are almost limitless, but when you need to know "How many ...?" the answer usually rests with the Count command.

Try this, using the Camplist database:

```
. use camplist
. list

STRUCTURE FOR FILE:  A:CAMPLIST.DBF
NUMBER OF RECORDS:  00007
DATE OF LAST UPDATE: 00/00/00
PRIMARY USE DATABASE
FLD      NAME      TYPE      WIDTH  DEC
001      Item       C         010
002      Weight     N         002
003      Cost        N         005  002
004      Owner       C         010
** TOTAL **                00028

00001  BACKPACK    10      69.22  KARL
00002  CANTEEN     3       13.31  FRED
00003  FLASHLIGHT  5       15.97  CECI
00004* FOOD       30      45.01  GROUP
00005* RAINGEAR  7       13.79  VALERIE
00006  STOVE       25      90.52  KARL
00007  TENT       12      66.38  LISA B.
```

```
. count for weight <50 .and. weight >20
COUNT = 00002
```

```
. count for cost <13.00 .and. weight >30
COUNT = 00000
```


```
. count for *
COUNT = 00002
```

The "count for *" is a tricky way to determine how many of your records you have previously marked for deletion.

The typical syntax for figuring the number of people in a given ZIP-code area is:

```
. count for zip > 90000 .and. zip < 99999
COUNT = 00079
```

If your ZIP-code field is of the character (C) type, rather than numerical (N) in nature, replace `zip` with `val(zip)`,

 **When you need to know "How many ... ?" the answer usually rests with the Count command.**

which converts the field into a numerical value before performing the comparisons.

You can store the result of the counting process in a memory variable for later reference or use it in a program:

```
. count for * to keeper
. ? keeper
2
```

If all you want to know is how many records you've got, just type:

```
. count
277
```

But it's faster to type `goto bottom and ? #` or display structure.

Here is a list of the possible variations of the Count command, using all of its possible arguments in a hypothetical example. The Next phrase results in limiting the search to only the next 20 records, beginning at the current position of the record pointer. The While phrase tells dBASE to check first to see whether the part number is above 100. If it is, the count continues—otherwise, it stops.

```
. count for part:no = 123
. count next 20 for part:no = 123
. count next 20 for part:no = 123 to x
. count next 20 for part:no = 123 to x
while part:no > 100
```

Well, until next time, continue to experiment, and if the area of memory variables seems a bit opaque to you, don't worry. Once we get into writing programs in dBASE II, what you have learned will pay off. And remember—keep those data files backed up. **+**

dBASE II is a trademark of Ashton-Tate.

Creative Computing

the #1 magazine of computer applications and software

December 1983
Vol. 9, No. 12
\$2.95

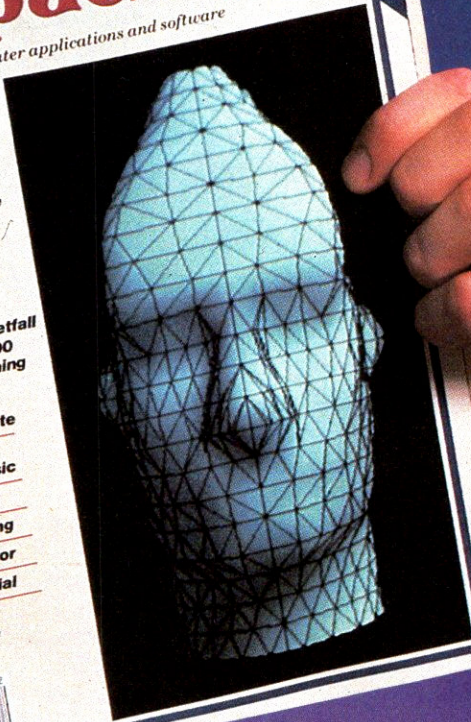
CREATIVE COMPUTING

VOL. 9, NO. 12

DECEMBER 1983

In-Depth Evaluations:

- Kaypro 10
 - Casio FX-700P
 - Quadlink
 - Koalpad
 - Pixy Plotter
 - Percom TI Disk Drive
 - Apple Mechanic
 - The Tool
 - DiversiDOS
 - XEdit
 - Memory / Shift
 - MULE
 - Witness and Planetfall
 - Games for TS 1000
 - Arcademic Learning Series
 - Spacediscs
 - Controller Update
- High Precision Functions in Basic
- CBasic Clinic
- Basic Debugging
- Input Line Editor
- Plotting Tutorial
- Preventive Maintenance Primer



SOFTWARE TO STIMULATE

Stimulate your mind every month with the #1 magazine of computer applications and software... CREATIVE COMPUTING! There is no other magazine like CREATIVE COMPUTING... WE TALK YOUR LANGUAGE!... Any make... any model... whether it's Apple, IBM, Radio Shack, TI, Mattel, Atari, Commodore... CREATIVE COMPUTING has monthly departments and articles you can use! You will receive a continuing education on *everything* related to personal computing with intriguing and useful applications for your personal computer. This is a magazine that will help you get more out of your computer—versatility, function and enjoyment—in easy-to-read and fully illustrated articles!

Subscribe to CREATIVE COMPUTING today and save up to 33%!

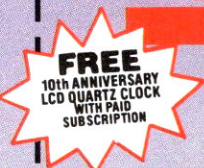
YES

creative computing

P.O. Box 5214, Boulder, Colorado 80322

Please enter my subscription to CREATIVE COMPUTING for:

- | | | |
|--|---|---|
| <input type="checkbox"/> One year (12 issues)
for \$19.97.
I SAVE 20%! | <input type="checkbox"/> Two years
for \$36.97.
I SAVE 26%! | <input type="checkbox"/> Three years
for \$49.97.
I SAVE 33%! |
|--|---|---|



Mr./Mrs/Ms _____ (please print name in full) 8H088

Company _____

Address _____

City _____ State _____ Zip _____

Check one: Payment enclosed Bill me later

Charge my: American Express Visa MasterCard

Card No. _____ Exp. Date _____

Savings based on full one-year subscription price of \$24.97.
Please add \$5 per year in Canada, \$10 per year in all foreign countries.
Please allow 30 to 60 days for delivery of first issue.



NEWS +/BY FREDERIC E. DAVIS

Your inside source for developments and trends in the personal-computer industry

Welcome to News +, a new monthly report about the latest happenings, trends, predictions, and speculations in the world of microcomputing. Although the focus will naturally be on Apples, information about other important companies that affect Apples will also appear here in order to give you a wider perspective on the industry.

Since this is my first report, I'll take this opportunity to introduce myself. I've been using computers as a personal productivity tool for over 17 years. In fact, computers (and their associated corporate culture) have influenced my life from the very beginning—my father has worked for IBM since I was a baby.

While I was in high school, I dreamed of having a computer of my own, but it was a wild fantasy, since computers then cost millions of dollars and filled several large rooms with equipment. Ten years passed, and in 1977 the Apple II was introduced. Suddenly the idea of having my own computer was no longer so farfetched. After spending several months transfixed at a friend's Apple II, I decided to take the plunge. I consolidated the family resources and bought an Apple.

My wife, Robin, looked on with amazement (and eventually some horror) as I devoted more and more of my time, and the family budget, to the Apple. First the computer, then a disk drive, then a monitor, a printer, a modem, another disk drive, a CP/M card, an alpha Syntauri music synthesizer—you get the idea. Robin must finally have decided that it was either love it or leave it, and, much to my surprise, I caught her staying up late one night playing Falcons on the Apple. My wife was a graduate student, and when she realized how much the Apple could help her with word processing and research, we ended up vying for computer time. We've been a two-computer family ever since. Now that the Macintosh is here, I'm pushing the idea that in the

case of computers, three might *not* be a crowd.

Before joining the A+ team, I had a computer-consulting practice in San Francisco and was a free-lance science writer. I have B.A. and M.S. degrees from Antioch University, and I'm currently a Ph.D. candidate at Union Graduate school. Articles of mine have appeared in many publications, including *PC World*, *PCjr World*, *Whole Earth Software Review*, *Computer + Software News*, *Garden Magazine*, and *Orchid Review*. I've written several books, including *Hardware for the IBM PC and XT* published by PC World Books and Simon & Schuster, and *A Dictionary of Plant Names and Their Meanings* being published by Stanford University Press. As you may have gathered, I like plants as well as computers. Maybe that's why I've always thought "Apple" is such a great name for a computer.

Has some aspect of computing changed your life? Have microcomputers altered your way of doing business? I'd like to hear from you. If you have any news, suggestions, or comments, please send them to me here at A+.

▶ THE BEST SOFTWARE MARKET

More than a million Apple II and compatible computers are now in use, and sales have been as high as 100,000 new systems per month. Even though sales of the IBM Personal Computer have recently been exceeding sales of the Apple II, Apple software continues to dominate the best-seller list. In fact, during one recent month, Apple Writer overtook the popular WordStar word-processing program in total sales volume—an amazing feat, considering that WordStar runs on over 800 different computers and Apple Writer runs only on Apples (and a handful of compatibles).

A big reason that the Apple software

market is relatively lucrative for developers is that Apple owners buy more "disposable" software such as games and hobby diskettes, which are less expensive to develop and market than longer-lasting software. IBM PC users, on the other hand, tend to buy only a few "high-ticket" software packages such as WordStar and Lotus 1-2-3. Since the Apple has been around for over twice as long as the PC, Apple owners have upgraded their business software more often.

Another contributing factor in the software sweepstakes is that most Apples are purchased by upper-income individuals for a multitude of different purposes, and many IBM PC's are purchased by cash-conscious companies in multiple quantities for a specific function. The greater diversity among Apple owners means that the Apple software aftermarket will probably continue to remain healthier than the aftermarket for IBM PC software.

▶ ARTISTS PRAISE MACINTOSH

Artists of all types, including traditional artists, commercial artists, computer-graphics specialists, and art hobbyists, are enthusiastic about the Macintosh. "The Mac is the most magical personal computer I've ever seen!" exclaims Dr. Adele Aldridge, chief executive officer of Magnetic Arts, a computer-graphics company in Sausalito, California. According to Aldridge, "elements of creative artistic design are found in the hardware, operating system, and application software. The Quickdraw graphics software built into each computer gives the Macintosh graphics capabilities far superior to those of any other personal computer. The MacPaint program is a wonderful example of how the Quickdraw graphics can be used in an application program. MacPaint is a wonderful tool—I'm sure it will help many artists become interested in personal computers."

▶ HUGE GROWTH PREDICTED FOR IBM

A recent issue of Dun & Bradstreet's *Datamation* magazine makes bold predictions about IBM: (1) gross revenues of \$35 billion last year (compared to slightly over \$1 billion for Apple) will grow to \$88 billion in four years; (2) in that same time, annual profits will grow from over \$1 billion in 1983 to over \$8 billion; (3) by 1988, IBM revenues will account for 2% of the gross national product (GNP). As a possible countermeasure to IBM's potential domination, AT&T is reportedly discussing a major deal with Apple that would include selling Apples at phone stores. A strong pact between AT&T and Apple could give IBM a real run for its money.

▶ THE NEW APPLE NETWORK?

Datamation also reports that IBM has not one, but two, local-area networks (LANs) ready to market. Apple, along with the rest of the computer industry, has been anxiously awaiting an official announcement from IBM on this subject.

According to *Datamation*, one is a "token passing" network developed by IBM in Zürich, Switzerland, and in

Research Triangle Park, North Carolina. It is compatible with IBM's Systems Network Architecture (SNA), which larger IBM computers use.

The other is a potentially more powerful, broader-bandwidth CSMA/CD network reportedly being developed by Sytek of Mountain View, California. IBM's CSMA/CD local-area network is the one likely to be adopted as an industry standard for microcomputers.

▶ THE MOST POPULAR CP/M COMPUTER

Computers in the Apple II series, as Apple sells them, are incapable of running the popular CP/M operating system, since they do not contain the necessary Z80 CPU chip. Now, over a quarter of a million Z80 coprocessor boards have been sold for the Apple, making it the premier CP/M computer. Sales of Z80 coprocessors are continuing at a steady rate, as more owners of Apples and compatibles decide to add CP/M capabilities to their computers.



▶ A MIGHTIER MACINTOSH?


The Macintosh is not as powerful as some people at Apple think it should be. Some members of the Macintosh de-



sign team hoped that the computer's disk capacity and internal RAM would be much larger. The Mac currently has a single-sided 3½-inch disk drive from Sony, which can store about 400K of data. Apple had originally intended to use double-sided drives with twice the storage capacity per diskette, but Sony was not able to supply the double-sided drives in time for Mac's introduction this past January. Apple still wants the double-sided drives and promises they will be available by the end of this year.

Apple is promising another important Macintosh feature by next year: more internal memory. The Mac currently contains a bank of 16 64K RAM chips, for a total of 128K bytes of available RAM. Apple had originally hoped to obtain 256K RAM chips instead of the 64K chips. If, instead of 64K RAM chips, you had 16 256K RAM chips, you would have 512K, four times the Mac's current internal memory. Although many forecasters have predicted that the price of RAM chips would take a prolonged nosedive, RAM costs have remained higher than expected, and 256K chips have been in extremely short supply. Apple still hopes, however, that prices will plummet as soon as availability increases.

We Will BEAT Any Advertised Price or You Receive a FREE Gift!!







<p>REG. PRICE 5 1/4" 28.95 SS/DD SOFT SECTOR</p> <p>5 1/4" 39.50 DS/DD SOFT SECTOR</p>	<p>1 Buy 2 to 4 Boxes Get a Library Case With Ea. Box Free</p> <p>or</p> <p>10% OFF REG. PRICE \$4.00 VALUE</p>
<p>SPECIAL</p> <p>VERBATIM 5% SS/DD SOFT SECT. 23.95</p> <p>MEMOREX 5% SS/DD SOFT SECT. 23.90</p> <p>3M - SCOTCH 5% SS/DD SOFT SECT. 22.90</p>	<p>2 maxell Buy 5 to 9 Boxes Get a Plastic Storage Flip n File Box (Holds 75 Mini-Disks) Free</p> <p>or</p> <p>15% OFF REG. PRICE \$35.00 VALUE</p>
<p>Add \$2.00 Handling in USA</p> <p>  C.O.D.</p> <p>5% Tax in Fla. Only APO/Box No's & Canada Add 3.50 Shipping</p> <p>MEGA BYTE INDUSTRIES 4699 S.W. 45th Street Ft Lauderdale, Florida 33314 305-587-1130</p> <p>1-800-327-1013</p>	<p>3 maxell Buy 10 Boxes Get a Complete Computer Maintenance Kit Free</p> <p>or</p> <p>25% OFF REG. PRICE \$45.00 VALUE</p>

* Allow one week delivery. This offer may be retracted anytime.

CIRCLE 168 ON READER SERVICE CARD

Some of the World's Largest computer companies

Call Us


for medical systems on their machines.

Why don't you...

The reason is simple. We do a better job and have more features than our competitors. Below are just a handful of our special features.

- AMA Claim Form • Multiple Providers • Daily Journal
- Productivity Report • Superbill • Referral Letters
- RVS/ICDA Codes • Patient Recall • Financial Histories
- Hotline Service • Word Processing • Appt. Reminder
- Collection Report • Private A/R Aged
- Manual & Training System Available • 100,000 Patients
- 22,000 Patient Appointment System

Call your dealer for a FREE demonstration or call CMA about our low cost "See it in Your office" training units.



MICRO COMPUTER DIVISION
55722 Santa Fe Trail
Yucca Valley, California 92284
(619) 365-9718

CIRCLE 165 ON READER SERVICE CARD

TEST-FLY A \$20 MILLION JET ON AN APPLE? YES! WITH MicroSPEED.

At the Bethesda Naval Research Center, they've discovered the power of MicroSPEED. The Navy's engineers use this remarkable hardware/software combination to "fly" an advanced fighter aircraft in *real time*—even making vertical landings on a simulated carrier deck. A "crash" is merely another learning experience, and an opportunity to modify the research aircraft—inside the Apple—to improve tomorrow's combat planes.

Surprised that such a sophisticated task is possible on the Apple? So were the Navy's officials, and many others who have discovered . . .

THE MicroSPEED DIFFERENCE This extraordinary Language System exploits the real potential of the microcomputer for the first time. The difference between MicroSPEED and other programming languages is that with MicroSPEED, there is virtually *no limit* to what you can achieve. It may well be the ultimate language for the Apple II, //e, and /// (and soon the Macintosh!). MicroSPEED literally combines the performance of a minicomputer with an exhaustive set of user-friendly capabilities: hardware math processing, fast hi-res

graphics and text, turtle graphics, print formatting, two text editors, unlimited data types, and incredible FORTH extensibility—all at speeds up to 100 times faster than BASIC.

USER-FRIENDLY, EASY-TO-LEARN Starting with simple commands that are comfortable even for non-programmers, MicroSPEED extends and builds, allowing you to create your own tailored application languages. The capability of your computer will grow exponentially, as you work in an active partnership with the machine, exploring and developing new problem-solving facilities—creating, correcting, refining your increasingly powerful system.

DEMANDING JOBS AT LOW COST MicroSPEED has been put to the test in fields as diverse as medicine, the stock market, oceanography, and the arts. In even the most challenging applications, MicroSPEED users have been unanimous in their praise of the System and manual. Typical comments are:

"... we are more than pleased with MicroSPEED... I can't imagine using BASIC on any future applications."

Roger Guevremont, National Research Council of Canada.

"I continue to marvel at its versatility and power."

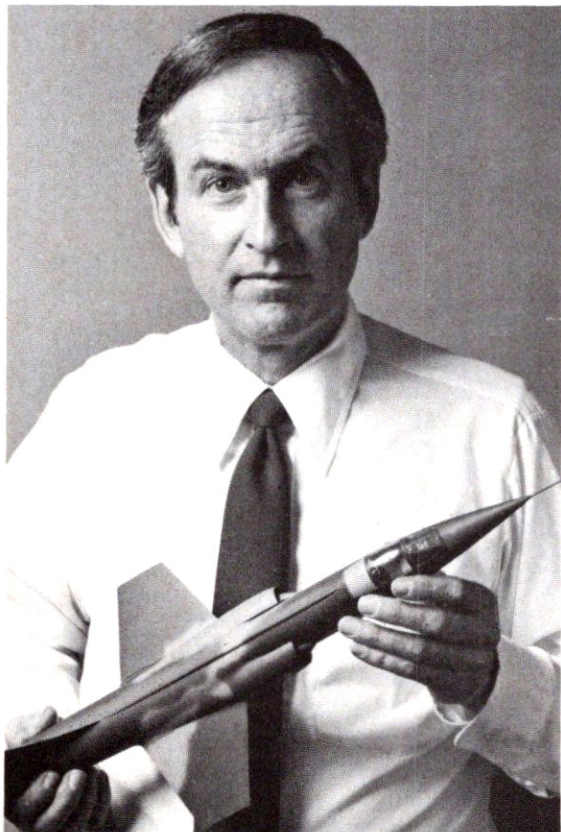
Carl R. Schramm, USCG Base, Kodiak, Alaska.

"Great!... A joy to use."

Henry Harris, Mission Design Manager
Jet Propulsion Laboratory

"If you plan to use a personal computer for any demanding task, then we built MicroSPEED for YOU."

Sam Cottrell, President of Applied Analytics.



MicroSPEED requires the Apple Computer with single disk. MicroSPEED II includes 2 MHz math processor. MicroSPEED II+ includes 4 MHz math processor.

Applied Analytics Incorporated
8235 Penn-Randall Place
Upper Marlboro, Maryland 20772

(301) 420-0700

Please send me:

_____ MicroSPEED II, \$395.00

_____ 160 Page Manual, \$15.00

_____ MicroSPEED II+, \$495.00

_____ Detailed Information

Name: _____

Company: _____

Address: _____

City _____ State _____ Zip _____ Phone No. () _____

MicroSPEED 
APPLE IS A TRADEMARK OF APPLE COMPUTER INC.



MAIL ORDER PRICES!



A NEW KIND OF COMPUTER STORE — WE DISCOUNT EVERYTHING!

ALGEBRA I, II, III, IV EACH	29.95
ASCII EXPRESS PRO	99.95
ALSCP/M CARD w/64K MEM	299.95
AMDEK 300 AMBER	149.95
AMDEK COLOR I	299.95
BANK STREET WRITER	46.95
BEAGLE APPLE MECH	19.95
BEAGLE BAG	19.95
BEAGLE BASIC	24.95
BEAGLE DOS BOSS	17.95
BEAGLE DOUBLE TAKE	24.95
BEAGLE FLEX TEXT	19.95
BEAGLE PRONTO DOS	19.95
BEAGLE TIP DISK #1	14.95
BEAGLE TYPEFACES	14.95
BEAGLE UTILITY CITY	19.95
BROTHER (DYNAX) DX 15	449.95
CHOPLIFTER	25.95
COPY II+	29.95

DANA SUPER FAN	44.95
SURGE SUPPRESSOR, 2 GR. OUTLETS, LIGHTED FRONT SWITCH (SAME AS SYS SAVER®)	

D BASE II	399.95
DB MASTER IV NEW	269.95
DB UTILITY PAK	89.95
DEADLINE	33.95
DISK NOTCHER	14.95
DOLLARS & CENTS	79.95
DR. J AND THE BIRD GO ONE-ON-ONE	34.95
EPSON FX 80	489.95
EPSON FX 100	699.95
FINGER PRINT (EPSON)	49.95
FIRST CLASS MAIL	69.95
FLIGHT SIMULATOR II	39.95
FLIP 'N FILE	7.95
FONTRIX	59.95
FORMAT II ENHANCED	109.95
GEMINI 10X 120 CPS	269.95
GRAPPLER+ INTERFACE	119.95
GRAPPLER + w/16K ON-BOARD BUFFER (TO 64K)	169.95

★ HAYDEN SOFTWARE ★ HOW TO PROGRAM APPLESOFT BASIC	39.95
--	-------

HOME ACCOUNTANT	49.95
HOME WORD	39.95
INSTANT RECALL	49.95
KIDS AND APPLES	14.95
KNOW YOUR APPLE //e	21.95

KOALA PADS	79.95
------------	-------

LETTER PERFECT	99.95
MAGIC CALC	99.95
MAGIC WINDOW II	99.95
MAXELL/VERBATIM (SSDD)	24.95
MICRO SCI XL DRIVE	169.95
MICROSOFT SOFTCARD	239.95
MICROSOFT //e SOFTCARD CP/M 80 COL & 64K (1 CARD)	299.95
MILLIONAIRE	49.95
MINER 2049ER	29.95
MOCKING BOARD	79.95
MULTIPLAN MACINTOSH	159.95

★ NEW FROM HAYES ★ MICROMODEM //e \$249.95

SUPPORTS II+, //e, APPLE III
INCLUDES
SMARTCOM I SOFTWARE AND
FREE SOURCE SUBSCRIPTION

Hayes Smartmodem
1200 BD RS232 \$499.95

Rana Systems
Elite One 239.95
Elite Two 379.95
Elite Three 479.95
Rana Controller 75.00

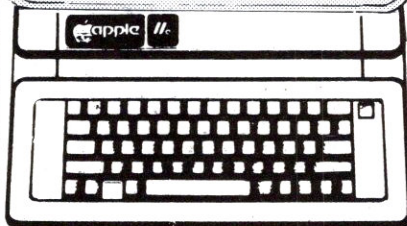
GARDEN OF EDEN COMPUTERS

16485 Magnolia
Westminster, CA 92683
½ blk. N. of the 405 Frwy.
Mon-Fri 10-6:30 Sat 10-5
CLOSED SUNDAYS & TUESDAYS

—ORDERS ONLY—
800-762-3227

—OUTSIDE CALIFORNIA ONLY—

714-841-4994
INSIDE CALIFORNIA



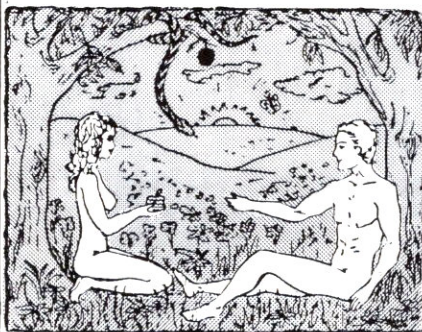
★ NEW ★

ABATI LQ 20

Letter Quality Printer
18 CPS
QUME DAISY WHEEL &
RIBBON CARTRIDGE COMPATIBLE
1 YR. WARRANTY

MOST AFFORDABLE PRICE

\$429.95



MULTIPLAN DOS or CP/M	169.95
MUSIC CONST SET	34.95
NEC 12" GREEN	119.95
NEC 8023 PRINTER	379.95
NOVATION APPLE CAT II	249.95
NOVATION EXP MODULE	36.95
NOVATION HAND SET	26.95
NOVATION TOUCHTONE	85.95
OKIDATA 92P	439.95
OKIDATA 93P	729.95
PADDLE ADAPPLE	26.95
PFS FILE //e or II+	79.95
PFS GRAPH //e or II+	79.95
PFS WRITE //e	79.95
PFS REPORT //e or II+	79.95
PIE WRITER	109.95
PINBALL CONST SET	34.95
PROMETHEUS PRO MODEM 1200 BD	399.95
PROMETHEUS VERSA CARD	149.95
PROWRITER 8510	349.95
RANA ELITE I	239.95
RANA ELITE II	379.95
RANA ELITE III	479.95
SARGON III	39.95
SATURN SYSTEM 128K	379.95
SENSIBLE SPELLER	79.95
SPELLING BEE GAMES	29.95
SUPERTEXT PRO	119.95
SYSTEM SAVER FAN	64.95
TAXAN 12" AMBER	139.95
TAXAN 12" COLOR RGB	299.95
T.G. JOYSTICK	42.95
T.G. SELECT-A-PORT "THE WORD" BIBLE PROCESSOR	139.95
TYPING TUTOR	19.95
ULTIMA III	39.95
USI 12" HI RES AMBER	139.95
USI 12" HI RES GREEN	135.95

VIDEX 80 COL CARD w/SOFTSWITCH & INVERSE CHIP	169.95
--	--------

VIDEX ENHANCER (7)	109.95
VIDEX FUNCTION STRIP	39.95
VISICALC //e 128K	239.95
WIZARD IPI PARALLEL INTERFACE	62.50
WIZARDY	36.95
WORDSTAR or INFOSTAR w/FREE CP/M CARD	329.95

LIST HANDLER, WORD HANDLER AND SPELL HANDLER ALL 3 PIECES	★ 99.95 ★
---	-----------

ZAXXON	29.95
ZENITH 12" GREEN	99.95
ZORK I, II, III	EACH 26.95

BECAUSE HARDWARE AND SOFTWARE
PRICES ARE CHANGING SO RAPIDLY,
WE URGE YOU TO CALL US FOR OUR
VERY LOWEST CURRENT PRICES!

WE APPRECIATE YOUR BUSINESS and will do
everything we can to make you happy.

TERMS: F.O.B. Westminster, CA. We accept VISA,
Mastercard, Cash, Checks, Certified Checks are
better. Money Orders and Purchase Orders (2% 10-
Net 15). Add 2% for bank cards & P.O.'s. Ask about
our return policy. Prices are subject to change and
hopefully will go down! Unless otherwise noted, all
prices are Apple.

Apple is a registered trademark of Apple Computer.
EPSON is a registered trademark of EPSON America.

When the chips are finally available, the Mac will be able to contain up to a half a megabyte of RAM without any changes in the design of the computer.

► APPLE'S LISA-UPGRADE POLICY

Many purchasers of the Lisa 1 computer are not pleased with Apple's policy for upgrading their machines to Lisa 2's. Although Apple has offered to upgrade Lisa 1's to Lisa 2's at no cost, the deal is not as good as it first seems. The Lisa 1 has two built-in 5¼-inch floppy-disk drives capable of storing over 800K each. The "upgraded" Lisa 2 has only one 3½-inch drive capable of storing only 400K, which results in a net loss of more than a megabyte of on-line diskette storage. Another gripe is that it will cost \$2495 to upgrade a Lisa 1 to a top-of-the-line Lisa 2/10, which costs only \$5495 retail. A San Francisco Lisa 1 owner's complaint is typical: "I paid \$10,000 for my Lisa 1 last year, and now Apple tells me I have to pay another \$2495 to upgrade to a Lisa 2/10. That means I'll wind up paying \$12,495 for a machine that costs \$5495. Even if I get some kind of trade-in value for my ProFile hard disk, I'm still out over \$5000."

Sales of the Lisa 1 were disappointing for Apple; some people think that the company should be more generous to the faithful few who paid the full \$10,000 for their Lisa 1's.

► INDUSTRY COMMITMENT TO APPLE II

Several new products for the Apple II family of computers help reinforce the idea that the Apple II will be around for quite a while. Apple has started shipping ProDOS, the long-awaited new operating system, and Appleworks, an integrated software package with word-processing, data-file, and spreadsheet functions.

Also, the Apple II family will finally have IBM PC compatibility, thanks to Rana Systems, of Chatsworth, California. The firm has announced a new multifunction peripheral that combines 256K RAM; two double-sided, double-density disk drives; and an 8086 processor that can run MS-DOS, MicroSoft Windows, and other popular operating systems. Lotus Development Corporation promises that its 1-2-3 integrated spreadsheet program will be available for the Rana system soon. Word has it that, as a result, the Apple will be able to run 1-2-3 considerably faster than the IBM PC can. +

How to use computers to teach math!

COMPUTERS IN MATHEMATICS:

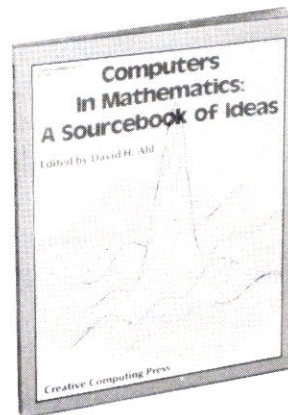
A SOURCE BOOK OF IDEAS

Now that more and more math departments have access to a micro-computer, the problem becomes: How to use the computer effectively as a teaching aid?

Here's where COMPUTERS IN MATHEMATICS can help you. This book of reprints from *Creative Computing* magazine is a goldmine of learning ideas, problem-solving strategies, programming hints, puzzles, brain teasers, and much more!

COMPUTERS IN MATHEMATICS covers nine subject areas:

- Computer literacy and computers in society.
- Thinking strategies and how to solve problems.
- Computer simulations and how to write them.
- Probability.
- Mathematical miscellany, from circular functions to differential equations.
- Art and graphics and their relation to mathematics.
- Computer Assisted Instruction (CAI).
- Programming style.
- Puzzles, problems and program-ideas.



8¼" x 11", softcover, hundreds of black-and-white diagrams and illustrations.

In all, COMPUTERS IN MATHEMATICS contains 77 fascinating articles, over 200 problems for assignment, and nearly 100 programs. Edited and with a preface by David H. Ahl, Editor-in-Chief of *Creative Computing*, this immensely practical volume is an invaluable classroom tool for teachers and students of all grades.

USE THE COUPON TO ORDER YOUR COPY TODAY!

CREATIVE COMPUTING PRESS Dept ND2B, 39 East Hanover Avenue
Morris Plains, New Jersey 07950

Please send me _____ copies of COMPUTERS IN MATHEMATICS:
A Sourcebook of Ideas, at \$15.95, plus \$2.00 postage & handling,* each. #12D

CHECK ONE: Payment enclosed \$_____ (CA, NJ and NY STATE residents add applicable sales tax.)

Charge my: American Express MasterCard Visa

Card No. _____ Expire Date _____

Signature _____

Mr./Mrs./Ms. _____ (please print full name)

Address _____ Apt. _____

City _____ State _____ Zip _____

*Outside USA add \$3.00 per order.

For faster service, call TOLL FREE 800-631-8112. (In NJ call 201-540-0445.)



FORMULA INTERNATIONAL INC.

12603 Crenshaw Blvd., Dept. B, Hawthorne, CA 90250

For information (213) 973-1921 • Orders Only (outside Calif.) (800) 672-8758



pinecom™

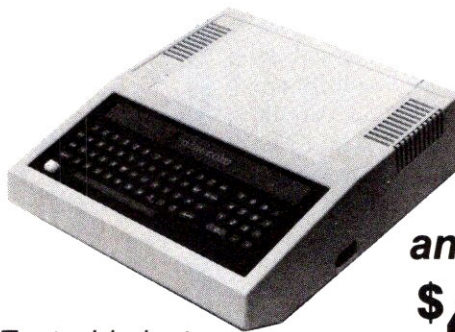
No Copyright Problems!

Compare These Features with Our Competitors:

- Powerful Utility Program (100% Apple Compatible)
- 68-Key Upper & Lower Case Keyboard with Numeric Keypad
- 25 Pre-programmed Function Keys
- 2 Speed Auto Repeat Function
- 64K User Memory—expandable to 192K
- 5A Switching Power Supply (110/220VAC)
- All ICs Are Socketed for Easy Service
- Nation-wide Dealer Network for Convenient Technical Support

And best of all, the price Assembled and Tested is just.

Pioneer of Low Cost Apple* Compatible Computer

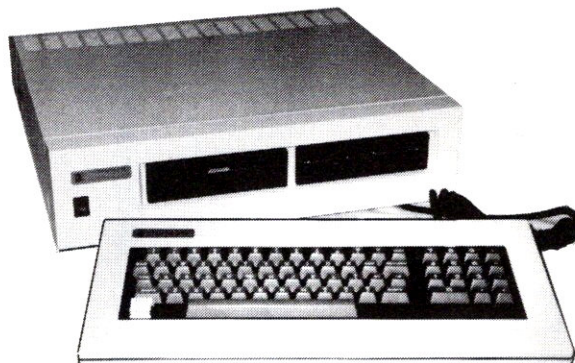


Now with New Improved Keyboard and 64K RAM
\$499⁰⁰



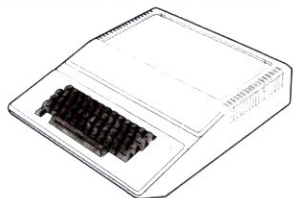
pinecom™ DP-64

- Dual Processor (6502 and Z80A)
- Detached Keyboard
- 64K RAM Expandable to 192K
- 25 Function Key Keyboard
- Auto Repeat Keys w/Upper/lower Case
- 2 Slim Disk Drives (optional)
- 100% Apple II Compatible
- 40/80 Column Display (optional)
- Runs Both Apple Soft and CP/M Software



CIRCLE 212 ON READER SERVICE CARD

Model DP-64 Fully Assembled ... **\$650⁰⁰**



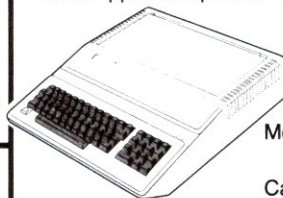
AP-II COMPUTER A&T

Apple Look Alike
48K User Memory
Supports Upper & Lower Case
100% Apple II* Compatible

\$455⁰⁰

MICRO-II COMPUTER

100% Apple Compatible • No Copyright Problems!



Model I 48K RAM

\$475⁰⁰

Model II 64K RAM

\$515⁰⁰

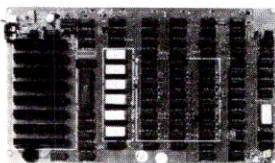
Model III 64K RAM w/Dual CPU

\$555⁰⁰

(6502 for Applesoft & Z80A for CP/M)

Case and Keyboard Only **\$159.95**

All above models are standard with Numeric Keypad, Function Keys, Auto Repeat Keys, Upper/lower Case Function, Fully Assembled and Tested.



AP-II MOTHERBOARD

Apple II+* Compatible
48K Memory Space
8 Expansion Slots

Bare Board **\$69.95 ea.**

Assembled & Tested **\$295.00 ea.**

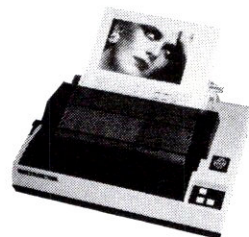
PERIPHERALS

- Autoterm 80-Col. w/Softswitch **\$99.95**
- 80-Column Card **99.95**
- 80-Column for Apple IIe* **49.95**
- Z80 CP/M Card (no software) **99.95**
- 16K RAM Card w/Cable **47.50**
- Parallel Printer Interface **85.00**
- Buffer for Printer Interface (16-64K) **85.00**
- Serial Printer Interface Card w/Adj. Baud **85.00**
- Disk Controller **65.00**
- Disk Controller DOS 3.2/3.3 Auto Select **75.00**
- EPROM Writer Card (2716/2732/2764) **75.00**

3M DISKETTES SALE

Single Sided / Double Density Soft Sector

10 for **\$24⁵⁰**



PRINTER by Super-5

Parallel Interface (Centronics Compatible) Standard
Microprocessor Electronics
80cps Bidirectional with Logic Seeking
96 Character ASCII
Adjustable Sprocket and Friction Feed

Model CP-80 **\$265⁰⁰**

SEND ONE DOLLAR FOR OUR DETAIL CATALOG

Shipping & Handling Charges

Purchase	Over \$50.00
10%	5%
15%	10%
25%	20%

Minimum Order \$10.00/Calif. Residents add 6.5% Sales Tax. Phone Orders Accepted on VISA or MC ONLY. NO C.O.D.'s. Prices subject to change without notice.



STORE HOURS
MON-FRI—10-7
SAT—10-6

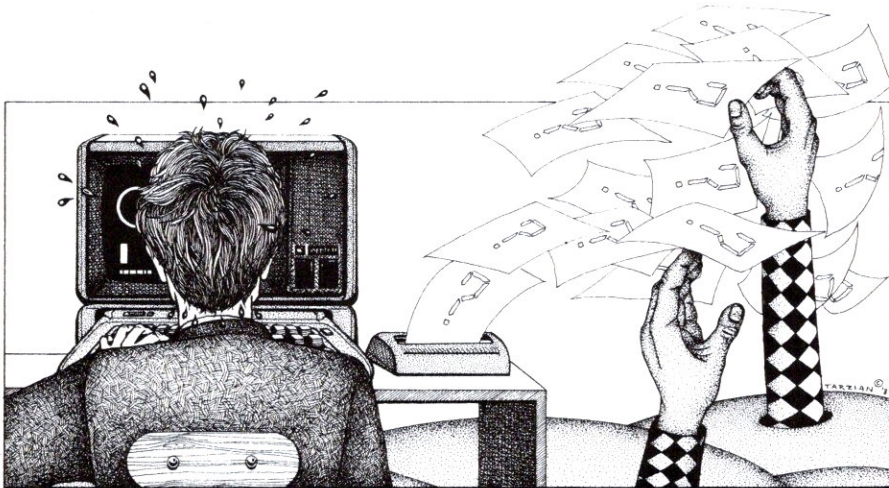
*Apple and Apple II are the trademark of APPLE COMPUTERS, INC.

Inside California
Outside Calif. (incl. Mexico & Canada)
Overseas



RESCUE SQUAD BY LINDSAY McGRATH AND KEN BOOROM

Tips from Rescue Squad on the use of special printer commands, variable names, Control-S characters, 80-column text cards, program listings, color monitors, and Apple Pascal



Getting output to printer from Pascal

Q. How do I get output to my printer from Pascal?

A. Declare a file called *PRINTER* and write your data to it. The following program will work in Apple II or Apple III Pascal.

```
PROGRAM PRINT — IT.
VAR P : INTERACTIVE:
BEGIN
  REWRITE ( P, 'PRINTER:' ) :
  { this line can be rewritten }
  REWRITE ( P, 'CONSOLE:' ) :
  { to save paper during debug }
  Writeln ( P, 'This will go to the
  PRINTER' );
  Writeln ( 'This will go to the CON
  SOLE' );
  CLOSE ( P );
END.
```

Anything printed from a *WRITE* or a *Writeln* in which 'P' is the first parameter will be sent to the file declared in the *REWRITE* statement (in this case *PRINTER*); everything else goes to the *CONSOLE*.

For more information refer to the following manuals.

Apple III Pascal
Programmers Manual, Vol. 1, Page 163
Apple II Pascal
Language Reference Manual, Page 27

Variable Names

Q. I'm an Apple II Plus owner and a beginning programmer. I'm just learning how to use variables. Do you have any tips on how to best incorporate them into my programs?

A. Yes. Remember to keep your variable names short and different. Although you can create names with many letters, your computer only pays attention to the first two letters of any

▶ Your computer only pays attention to the first two letters of any variable name in Applesoft.

variable name in Applesoft. Two-variable names, such as *FACT* and *FALL*, may look different to you, but Applesoft and Integer BASIC recognizes both as having the name *FA*. This kind of confusion can really complicate your programming.

Stray Control-S Characters

Q. Sometimes, when I use Control-S to look at a BASIC program listing on my Apple II Plus, a Syntax Error message appears on the next typed line. What is

my computer trying to tell me?

A. It sounds as though you inadvertently entered an extra Control-S after the program finished listing. The Apple put these extra characters into its input buffer, but then couldn't use them. No BASIC command begins with Control-S, so the Apple signaled that you had made a syntax error.

If this happens again, press the left arrow key (←) until the screen displays a new prompt line. This will purge the input buffer of any stray Control-S characters.

Turning Off an 80-Column Text Card

Q. How can I turn off my computer's 80-column text card from a program? I use an Apple IIe.

A. The Apple 80-column text card resides in the auxiliary I/O slot in the Apple IIe. This slot takes the place of slot 3 when you install an 80-column card. It works much the way the other I/O slots do, except in turning off the 80-column text card.

You should not use the comand *PR#0* to turn off the 80-column card because it won't completely disable the 80-column mode. To turn off the 80-column mode from within a program, use the following:

```
PRINT CHR$ ( 12 ) : CHR$ ( 21 )
```

This method will send the text output back to a 40-column format with a normal, flashing cursor. To turn the card back on, use the *PR#3* command. You should also use this technique whenever you send output to an external device, such as a printer or modem.

Underlining With Apple Writer

Q. When I want to underline in Apple Writer using the back-slash character, my printer prints *U_N_D_E_R_L_I_N_E*, instead of *UNDERLINE*. What am I doing wrong?

A: The back-slash character works only with the Apple Daisy Wheel Printer, the Apple Dot Matrix Printer, and the Qume Spring 5/45 and 5/55. To underline on other printers, look in your particular printer's manual under printer commands.

For example, the command to start underlining on the Apple Dot Matrix Printer is an Escape-X. The command to stop the underline is an Escape-Y.

To use them in Apple Writer, you would type in Control-V, Escape-X, Control-V, word you want to underline, Control-V, Escape-Y, Control-V.

Your Apple Writer manual can give you more information on using the Control-V function in Apple Writer.

Special-function codes for printers

Q: I have an Apple II Plus using DOS 3.3, Apple Writer II, a ProWriter printer, and a printer-interface card manufactured by Persoft. My problem is that I cannot figure out how to do special functions, such as underlining, from within Apple Writer II. The printer will perform underlining correctly when I run a program that uses the command for underlining as specified in the printer manual. How do I make Apple Writer II tell the printer to do special functions?

A: Each brand of printer uses its own set of special codes to activate features such as underlining, boldface, italics, and different font sizes. The first step is to identify what set of codes your particular printer uses. As an example, I will refer to codes used by the Epson FX-80 printer.

To invoke italics, for instance, you must send the printer the code Escape 4. To turn off italics, you use the code Escape 5. To implement these codes from within Apple Writer II, you first type Control-V, which allows you to enter Escape and Control codes directly from the keyboard. After pressing Control-V, you enter the code directly from the keyboard, in this case pressing the Escape key, which will result in an inverse bracket appearing on the screen. Since the Escape character is invisible, the inverse bracket lets you know that an escape has been entered. Follow the Escape with the number 4 (which turns on italics on the Epson). After you have entered the printer code, type Control-V again to return to the normal word-processing mode.

The process for entering Control codes is similar. If you wanted to enter a Control-O, for example, you would type Control-V (to enter the mode for entering Escape and Control codes),

then Control-O (the printer code), and then Control-V again (to exit from the special mode). Using the Control-V feature allows you to enter any combination of Escape or Control codes into the document to govern printing functions. For further information, see page 48 of the Apple Writer IIe manual.

Entering programs

Q: I am a recent purchaser of an Apple IIe, having owned my computer for only seven months. I have been using the word processor, and it has been great. Now I want to learn more about the capabilities of the Apple. How do I make the program listings I find in *A+* work?

A: A+ occasionally prints program listings as examples of programming technique. To use these programs, place the System Master disk in your first disk drive, close the door, and turn on your Apple. When the red light goes off, remove the System Master disk and insert a blank disk into the same drive (note: the blank disk must be initialized—read page 13 of the DOS manual for instructions on initia-

How do I make the program listings I find in *A+* work?

lizing disks). Before entering any program, type the word NEW and press the Return key. Enter the program exactly as it is printed in the magazine. Type RUN and press Return to run the program. Type LIST and press Return to show the line numbers and commands you typed in. Save your program by typing SAVE and the program name. Do not save two different programs with the same name. If you do, the latter one will erase the former. You can find more information on programming in BASIC in your Applesoft tutorial and DOS manual.

Color-monitor hookup

Q: I have been trying to find out how to hook my Apple IIe up to a Sony KX-1901 video monitor's 25-pin RGB input. I would appreciate any help that you can provide concerning this interface problem.

A: The Apple IIe's video generator produces signals radically different from those the Sony monitor expects. Briefly, an Apple IIe creates an image on its monitor by "painting" millions of dots on the screen with a paintbrush that starts in the upper left-hand corner and

moves down each of 525 lines on the screen until it reaches the bottom right-hand corner. The brush continually changes color from red to green to blue, so the colors appearing on the screen depend entirely on when the brush is told to paint. A single line carries all the information needed to show these three colors in varying intensities.

The Sony monitor is completely different. One of the 25 pins on the back of the monitor carries signals used to paint red dots on the screen, another carries signals for blue dots, another for green dots, and yet another carries a signal that tells the monitor how intense to make the dots when it paints them. To connect the Sony to an Apple IIe, you will need a circuit board that can divide the signals coming from the Apple IIe's single line into the 25 lines the monitor expects.

Many of the new color TVs (Sony Trinitron, for example) will give resolution approaching that of a RGB monitor when used with an Apple. A television is not the same as a monitor, however. To send an Apple's video output to a TV requires an inexpensive RF (radio frequency) modulator, available from any Apple dealer. If you buy a television, make sure it does not have digital tuning. You cannot adjust a digital tuner to receive the frequency an RF modulator produces.

More on Pascal

Q: Can you help me select the right Pascal system? I just recently purchased an Apple IIe with one Apple Disk II drive and one Rana disk drive. I'm a computer-science major, and I will soon be enrolling in a Pascal course.

A: If you want an easily installed, trouble-free Pascal language system that is compatible with your Apple, buy the one Apple Computer produces—Apple Pascal. Leading modem and 80-column/lowercase-board manufacturers recognize Apple Pascal as the standard Pascal for the Apple II. If you purchase one of these accessories, you can be sure it will work with your Pascal. When you buy the Apple Pascal system, you will get a language card, which you should plug into slot 0 of your computer. Anything else plugged into that slot will have to go. In all probability, your Rana drive is compatible with Apple Pascal, but write Rana first to make sure. **+**

Please send your questions and problems to Rescue Squad, A+, 11 Davis Drive, Belmont, CA 94002.

WILDCARD™

Make back-up copies of protected software quickly, easily, with just a push of a button.

Now! Two models of the leading copy card. One is right for you.

WILDCARD \$109⁹⁵

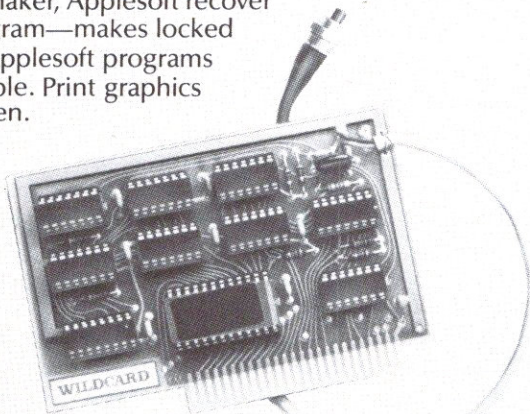
WILDCARD 2 \$139⁹⁵

Wildcards are the copycards that stack the deck in your favor. Rather than copying protected disks track by track like the old "nibble copiers," Wildcards ignore the disk and any copy protection on it. Instead, Wildcards take a snapshot of your Apple's memory. This creates an accurate copy of the original program.

WILDCARD

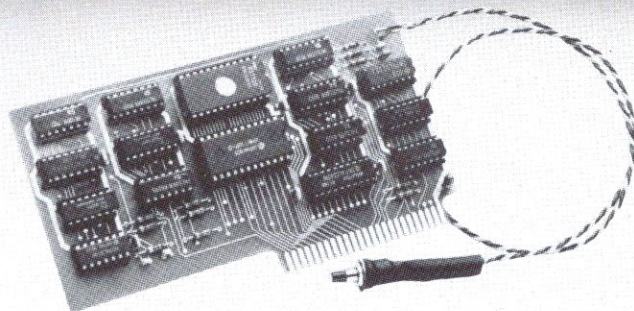
Our original. Perfect for the Apple II + ® with 64K. Over 10,000 satisfied customers.

- Wildcard copies both 48K and 64K programs.
- Wildcard creates DOS 3.3 compatible, autobooting copies.
- 40 column text screen dump.
- Files can be placed on a hard disk.
- Wildcard Utility Disk (included) contains: Automatic program compression and BRUN filemaker, Applesoft recover program—makes locked up Applesoft programs listable. Print graphics screen.



CIRCLE 169 ON READER SERVICE CARD

IMPORTANT NOTICE: WILDCARDS are offered for the purpose of enabling you to make archival copies only. Under the Copyright Law you, as the owner of a copy of a computer program, are entitled to make a new copy for archival purposes only and the WILDCARDS will enable you to do so. WILDCARDS are offered for no other purpose and you are not permitted to utilize them for any other use, other than specified. Software is not copy protected.



WILDCARD 2

Designed for the Apple IIe® with 64K or 128K.

- Fast! Copies 64K programs in 25 seconds, 128K programs in 50 seconds.
- New, self-prompting software. Absolutely no technical expertise is required.
- Text screen dump has been enhanced to print 40 or 80 columns.
- Utility Disk is included for making BRUN files.
- New! Automatic compressor for compact BRUN files.
- Access Apple monitor, allowing for program changes and listings.

Order by phone, (212) 505-5470 or complete the coupon below and send your check, money order, Visa or MasterCard No. to East Side Software Co., 175 Fifth Avenue, Suite 3375, New York, NY 10010. Dealer inquiries welcome.

Please send (indicate quantity)	
_____ Wildcard(s) \$109.95 each.	\$ _____
_____ Franklin 1000/1200 owners require mod kit. \$8.00 <small>(For use with Wildcard only).</small>	\$ _____
_____ Wildcard 2(s) \$139.95 each.	\$ _____
In U.S. add \$4.00 for shipping and handling.	
Outside U.S. add \$10.00.	\$ _____
New York State residents add sales tax.	\$ _____
<input type="checkbox"/> Check enclosed <input type="checkbox"/> Visa <input type="checkbox"/> MasterCard	Total \$ _____
Card No. _____	Expires _____
Name on Card _____	
Name _____	
Address (UPS delivery) _____	
City _____	State _____ Zip _____ Phone _____
East Side Software Co., 175 Fifth Avenue, Suite 3375, New York, NY 10010	

System requirements: Wildcard: Apple II+ w/64K, Apple IIe, Wildcard 2: Apple IIe, II+, II. All cards work with Franklin computers. An \$8.00 mod kit is required for Franklin 1000, 1200.

Wildcard and Wildcard 2 are trademarks of East Side Software Co.
© 1984 East Side Software Co.

▶ PRODUCT NEWS



Passport Design's Soundchaser MX-5 synthesizer

▶ HARDWARE

Soundchaser MX-5

The Soundchaser MX-5 is a 16-digital-oscillator, two-channel, single-board synthesizer. The MX-5 sports a full-length, five-octave, professional music keyboard with improved cables, connectors, and synthesizers. A single circuit card contains the synthesizer, keyboard interface, clock sync, audio, and drum-machine connectors.

The Soundchaser MX-5 comes with Turbo-Traks—the 16-oscillator, 16-track recording software—and is available with Polywriter. All of the Soundchaser music software is available for the MX-5. (*List Price: \$1495; with Polywriter, \$1895*)

Requires: Apple II Plus or IIe; 48K RAM, 64K RAM with Polywriter; one disk drive with controller; game paddles or joystick; audio and video monitors
Passport Designs, Inc.

625 Miramontes Street, Suite 103
Half Moon Bay, CA 94019
(415) 726-0280

CIRCLE 550 ON READER SERVICE CARD

Imagewriter

The design of Apple's new Imagewriter dot-matrix printer is especially suited for reproducing high-resolution graphics at fast speeds. The printer is fully compatible with the Apple II series of computers, the III, the Lisa, and the Macintosh.

The Imagewriter prints high-resolution graphics at a rate of up to 180 characters per second (cps) and a full text up to 120 cps. The new printer uses bit-map graphics technology to support the graphics capabilities of the Lisa and the Macintosh. It uses a standard RS-232-C serial interface, so it will connect directly to the built-in serial ports of the Apple III or the Lisa. A special adapter

cable is available for connecting Imagewriter to the Macintosh. Apple's Super Serial Interface Card connects it to the Apple II Plus or IIe.

The Imagewriter's case acts as an acoustical insulator, reducing the printer's operational noise to less than 53 dB(A), a sound level lower than background conversation.

The printer features eight character fonts; users can design up to 175 additional characters and can mix various fonts in the same printed line. It provides variable resolution from 72 to 160 dots per inch and proportional font and spacing.

Imagewriter uses either friction-feed or adjustable-width pin-feed tractors and accommodates a range of paper widths from 3 to 10 inches. It uses single sheets of paper, fan-fold continuous forms, roll stock, and precut labels, and can print up to four copies at a time. (*List Price: \$675*)

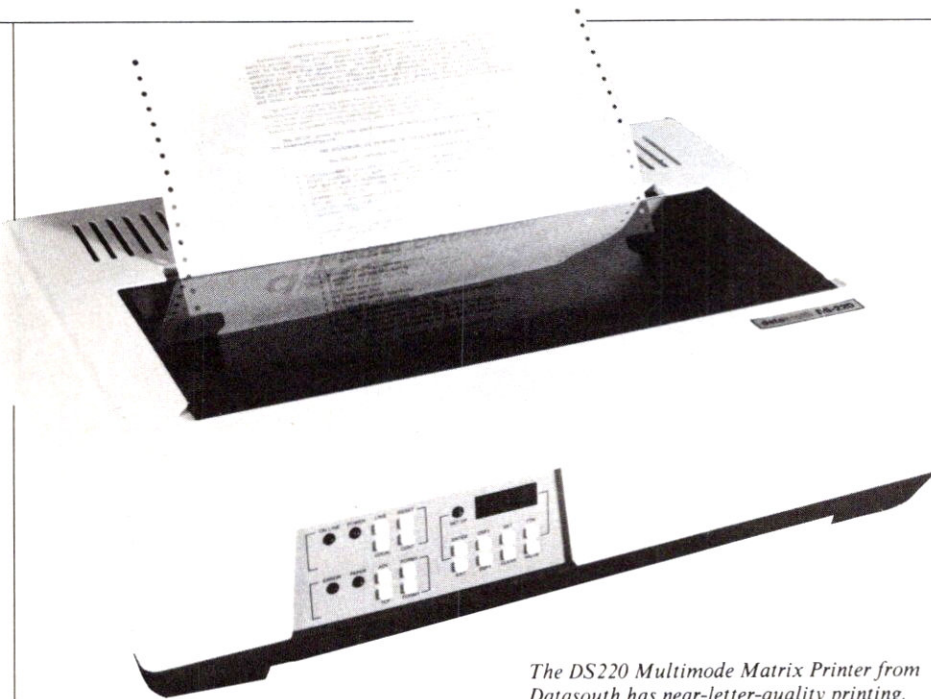
Requires: Apple II, II Plus, IIe, III, Lisa, or Macintosh
Apple Computer, Inc.
10260 Bandle Drive
Cupertino, CA 95014
(408) 996-1010

CIRCLE 551 ON READER SERVICE CARD

DS220 Multimode Matrix Printer

Designed to operate with high-performance micro- and mini-based business systems, the DS220 Multimode Matrix Printer combines three different printing capabilities: correspondence printing for word processing, draft-quality printing for high-speed data processing, and dot-addressable graphics.

In the Correspondence mode, the DS220 generates an 18 × 48 dot matrix for near-letter-quality appearance. Using a high-resolution two-pass-mode technique, the DS220 prints at 40 characters per second. Included as standard features are two correspondence-quality fonts, two memo fonts, variable-pitch draft fonts, and a special micro-character set. Also resident are seven international character sets. For print-intensive applications, the DS220 operates at 220 cps utilizing bidirectional logic-seeking printing. The high-resolution dot-addressable-graphics feature of the DS220 has the ability to print up to 217



The DS220 Multimode Matrix Printer from Datasouth has near-letter-quality printing.

columns for spreadsheets and then graphically output the results.

Compatible with virtually all microcomputers, the DS220 includes both serial and parallel interfaces as standard features along with a 2000-character buffer. (*List Price: \$1995*)

Requires: Apple II, II Plus, IIe, or Lisa
 Datasouth Computer Corporation
 4216 Stuart Andrew Blvd.
 Charlotte, NC 28210
 (704) 523-8500

CIRCLE 552 ON READER SERVICE CARD

Quadram Boards

Multicore is a socketed multifunction board that contains a parallel port designed to operate most parallel printers and a serial port to connect modems, printers, and other devices. It also contains a chronograph. It comes with a software package called RAMcore Drive, which enables you to set up part of the system's total memory as multiple RAM drives and so increase the speed of your system operation. (*List Price: \$395, 64K RAM version; \$495, 128K RAM version*)

Redicore is an enhancement board that contains five functions: a complete printer parallel port; a serial communications port; a chronograph; RAMcore Drive; and a buffered memory. (*List*

Price: \$249, no memory version; \$299, 16K RAM version; \$379, 64K RAM version)

Transcore can become a parallel or serial printer interface. On-board software provides drivers for popular printers, and you can change the card configuration through menu-driven software. (*List Price: \$199*)

eRAM 80 is an enhancement card designed to double the amount of text you can display on the Apple IIe monitor screen. You can switch between a 40-column or 80-column text display.

eRAM 80 also provides you with 64K RAM (40-column format) or 63K RAM (80-column format) of memory, in addition to the 64K RAM installed on the Apple's main logic board. (*List Price: \$159*)

Requires: Apple II, II Plus, or IIe; ProDOS or Apple DOS 3.3 (for Multicore, Redicore, and Transcore); Apple IIe only (eRAM 80).

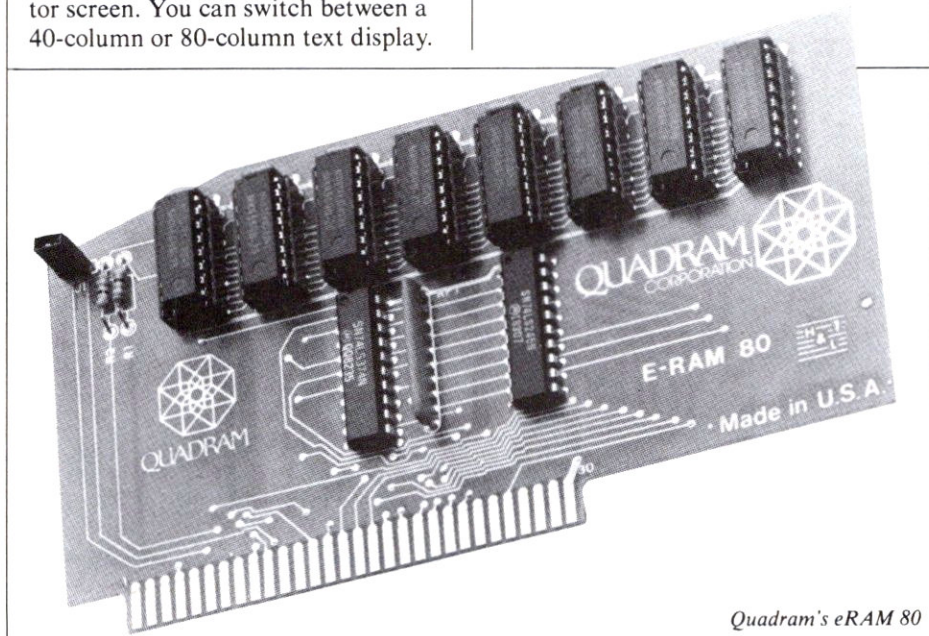
Quadram Corporation
 4355 International Blvd.
 Norcross, GA 30093
 (404) 923-6666

CIRCLE 553 ON READER SERVICE CARD

Apple Graphics Tablet

An electronic drawing board for creating computer graphics, the Apple Graphics Tablet enables users to develop and display block diagrams, architectural designs, logic diagrams, mechanical art, engineering schematics, and graphic art, in six different colors. The software utility that comes with the tablet allows users to save designs on a diskette and recall them later for review or revision.

The redesigned connecting cable meets FCC standards for radio-frequency interference. This new digitizing tablet is fully compatible with the variety of software packages available for the original product. (*List Price: \$795*)



Quadram's eRAM 80

PRODUCT NEWS

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; color monitor recommended

Apple Computer, Inc.
10260 Bandley Drive
Cupertino, CA 95014
(408) 996-1010

CIRCLE 554 ON READER SERVICE CARD

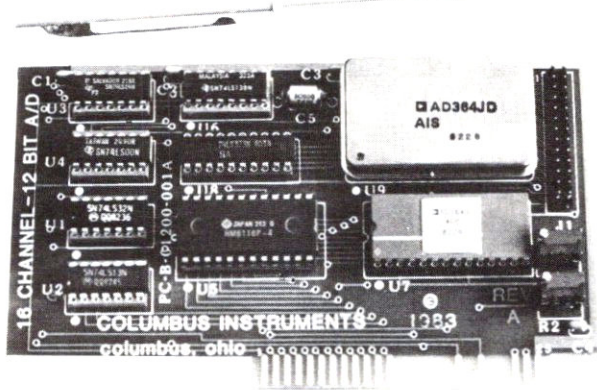
New Analog/Digital Converter

This 12-bit A/D card provides 16 single-ended or 8 differential inputs that are software selectable. On-board software eliminates the headaches of writing machine-language subroutines. Simple BASIC statements are sufficient to address the A/D converter through the special subroutines contained in ROM. True 12-bit operation over ± 5 -volt input range yields resolution of 2.4 millivolts while maintaining a maximum system nonlinearity of less than 0.012%. Full 12-bit conversion time is 25 microseconds and a short-cycled 8-bit conversion only 15 microseconds. (*List Price: \$599*)

Requires: Apple II Plus, IIe, or III in Emulation mode

Columbus Instruments
950 North Hague Avenue
Columbus, OH 43204
(614) 488-6176

CIRCLE 555 ON READER SERVICE CARD



New Analog/Digital Converter, from Columbus Instruments

Digital Scope Program

With the Columbus Instruments 12-bit analog/digital converter card, this program turns an Apple into a digital storage scope, which users—who can sample from any of 16 channels—operate by single-key commands. Users can save the 4096 point buffer on diskette. The triggering section permits the selection of triggering level and slope for the start of the sample. Using the horizontal scrolling, D.C. offset, and vertical expansion, users can view any part of the sample. (*List Price: Free with purchase of 12-bit A/D converter card*)

Requires: Apple II Plus, IIe, or III in Emulation mode; 12-bit A/D converter card

Columbus Instruments
950 North Hague Avenue
Columbus, OH 43204
(614) 488-6176

CIRCLE 556 ON READER SERVICE CARD

The Bank

The Bank is a random-access storage device for data applications that consist of large amounts of information. The Bank plugs into your Omninet local area network.

It accesses data randomly and can find any item of information on a 200-megabyte cartridge in an average of ten seconds. The cartridges come in two sizes, 100-megabyte or 200-megabyte—the latter capable of holding 66,572 typed pages of information. (*List Price: \$2195; \$70, 100-megabyte cartridge; \$100, 200-megabyte cartridge*)

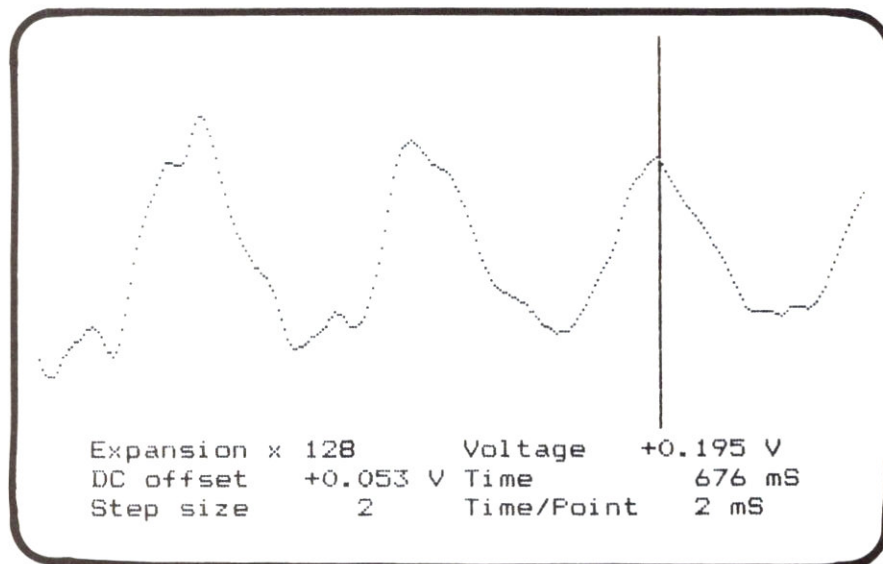
Corvus Systems, Inc.
2029 O'Toole Avenue
San Jose, CA 95131
(408) 946-7700

CIRCLE 557 ON READER SERVICE CARD

The Key—Serial Version

A serial version of The Key, a hardware module that protects software products from being pirated, is now available.

Interactions of software and The Key form inquiry/response pairs. The use of many inquiry/response pairs enhances the security and allows more than one software package to be utilized with the same Key. By requiring



Digital Scope Program, from Columbus Instruments



**WOODINVILLE
COMPUTER CENTER
INC.**

**SPECIALIZING IN
BUSINESS & EDUCATIONAL SOFTWARE FOR
APPLE, FRANKLIN & IBM COMPUTERS**

**OVER 2000 PRODUCTS IN STOCK
READY FOR IMMEDIATE SHIPMENT**

**APPLE/FRANKLIN
SUPER SPECIAL
DSTAR THIN LINE
DISK DRIVE \$189⁸⁵
2 OR MORE
ONLY \$184.85**

**SUPER SPECIAL
DISKETTES
SS/SD \$177⁷ Box of 10
DS/DD \$277⁷ Box of 10**

PRODUCTS FOR APPLE

- SOFTWARE PUBLISHING CORP.
PFS: WRITE IIe Reg. \$125 **\$99⁸⁵**
- HARCOURT-BRAGE-JANONOVICH
COMPUTER SAT Reg. \$79.95 **\$59⁸⁵**
- KOALA TECHNOLOGIES CORP.
KOALAPADS Reg. \$124.95 **\$99⁸⁵**
- SPINNAKER SOFTWARE
KIDWRITER Reg. \$34.95 **\$27⁸⁵**
- MONOGRAM
DOLLARS & SENSE Reg. \$100 **\$77⁸⁵**
- TERRAPIN
TERRAPIN LOGO Reg. \$149.95 **\$107⁸⁵**
- SUBLOGIC CORP.
FLIGHT SIMULATOR II Reg. \$49.95 **\$41⁸⁵**
- DESIGNWARE
SPELLICOPTER Reg. \$39.95 **\$31⁸⁵**

PRODUCTS FOR IBM

- LOTUS DEVELOPMENT CORP
1-2-3 Reg. \$495 **\$329⁸⁵**
- MICROSOFT
MICROSOFT WORD Reg. \$375 **\$266⁸⁵**
- HERCULES
HERCULES GRAPHICS CARD Reg. \$499 **\$377⁸⁵**
- ASHTON-TATE
dBASE II Reg. \$700 **\$449⁸⁵**
- BARRON'S EDUCATIONAL BASE
BARRON'S COMP. SAT Reg. \$89.95 **\$68⁸⁵**
- PEACH TREE SOFTWARE (GL/AR/AP)
SERIES 4 PEACHPAK Reg. \$395 **\$271⁸⁵**
- KOALA TECHNOLOGIES CORP.
KOALAPAD TOUCH TABLET Reg. \$150 **\$122⁸⁵**
- SOFTWARE TECHNOLOGY
MULTISOLVER Reg. \$295 **\$209⁸⁵**

Order Phone:

(206) 481-2699 M-F 9-6 PST

**TECHNICAL ASSISTANCE & CUSTOMER
SERVICE (206) 485-1707 M-F 10-2 PST**

**ADVERTISED SPECIALS
ALSO AVAILABLE AT OUR
NEW RETAIL OUTLET
13300 NE 175th
WOODINVILLE, WA**



If you don't see it in our ad call for lower prices.

SERVING YOU SINCE 1978

PLEASE!!! . . . MINIMUM ORDER \$50

Be sure to ADD \$2.50 shipping and handling for all software orders. Shipping on hardware items — EXTRA. ADD additional \$3.00 for Blue Label (Air). C.O.D.'s ADD \$5.00. Overseas orders EXTRA. Washington residents add 7.8% sales tax. We accept MASTERCARD, VISA, and AMERICAN EXPRESS. (American Express requires additional service charge).

TERMS AND CONDITIONS

ALL SALES ARE FINAL! Merchandise is new and covered by factory warranties. Returned merchandise will be subject to a restocking charge. Defective or damaged merchandise will be repaired or replaced if returned to us within 30 days from the invoice date. User caused damage is excluded. For RETURN AUTHORIZATION OR TECHNICAL ASSISTANCE please call CUSTOMER SERVICE at (206) 485-1707 between 10:00 AM & 2:00 PM Monday through Friday PST. We will not accept your returned item without a valid return authorization number. Your shipping expenses on merchandise you have returned to use is not refundable.

Name _____

Street _____

City _____ State & Zip _____

Card # _____ Exp. Date _____

Signature _____
P.O. Box 1028, WOODINVILLE, WA 98072

SEND \$2.00 for full color educational products software catalog. We accept purchase orders from schools & major corporations.



▶ PRODUCT NEWS

the use of The Key, software suppliers can control the use of their software. (List Price: \$300)

Requires: Apple II, II Plus, or IIe with Super Serial card
STAFF Computer Technology Corporation
10457 J Roselle Street
San Diego, CA 92121
(619) 453-0303

CIRCLE 558 ON READER SERVICE CARD

▶ HARDWARE/SOFTWARE

Talking Transend II

Talking Transend II incorporates Transend 2—the electronic communications package for the Apple II and IIe—a Transend modem, and an Echo II synthesizer board.

To use Talking Transend II, users simply put the disk in the drive and turn the system on.

The speech synthesizer speaks all information that the program writes to the video-display screen. When users type in information from the keyboard, each keystroke is spoken back to them. (List Price: \$195)

Requires: Apple II, II Plus, or IIe; 64K RAM; one disk drive; Echo II Speech Synthesizer; modem
Computer Aids Corporation
4929 S. Lafayette Street
Fort Wayne, IN 46806
(219) 456-2148

CIRCLE 559 ON READER SERVICE CARD

MegaTask Plus

MegaTask Plus is a combined, multi-product hardware and software package that provides an instant virtual-memory expansion, an Applesoft-compatible SuperBASIC, and a series of business-management packages that enhance the power and value of the Apple II in both systems programming and business applications. MegaTask and MegaDOS employ multitasking system processing techniques (as many as 16 programs or tasks can execute at one time); 8 megabytes of virtual memory; and 100 to 400 new mainframe BASIC commands. Applications include business graphics, editing systems and format-related commands, communications/corporate database-management

systems, and report-generator and business-analysis programs. (List Price: \$495)

Requires: Apple II Plus or IIe; AppleSoft; DOS 3.3
Quantum Leap Technologies
P.O. Box 7713
Silver Spring, MD 20910
(301) 565-4656

CIRCLE 560 ON READER SERVICE CARD

▶ HARDWARE ACCESSORIES

Clean Runner

Clean Runner, an interactive disk-drive program/cleaner, leads computer users step-by-step through the cleaning process. Clean Runner uses a lint-free cleaning surface bonded to a polyester diskette. Its exclusive program directs the head(s) of a computer's drive to a different track for each cleaning, providing a contamination-free cleaning surface.

Each cleaning operation takes less than 30 seconds, works on both single-sided or double-sided drives, and is programmed for 20 cleaning operations. (List Price: \$24.95)

Discwasher
1407 North Providence Road
P.O. Box 6021

Columbia, MO 65205
(314) 449-0941

CIRCLE 561 ON READER SERVICE CARD

Spikemaster

Spikemaster safeguards valuable computer hardware and software from damaging surges in electrical current. Spikemaster also protects audio and video systems from potential damage due to power surges. Spikemaster features include:

- multimode protection—common mode and differential mode incorporating five active-surge-suppression devices with a five-part filter section
- RFI filtering
- four widely spaced sockets with a 6½-foot heavy-duty cord
- circuit breaker
- on/off switch with indicator light
- 15-amp capability.

(List Price: \$79.95)

Discwasher
1407 North Providence Road
P.O. Box 6021



Discwasher's Clean Runner, an interactive disk-drive cleaner



Accidents will happen.

SNAPSHOT COPYKIT
For Apple //e[®] and][⁺
Only 159.95

Accidents happen . . . and your expensive software turns into meaningless garbage. Or just disappears. And that's a disaster unless you have the SNAPSHOT Copykit (for Apple*). A SNAPSHOT backup is your best "disaster" insurance.

MOST POWERFUL. The Snapshot system leaves the competition in the dust, giving you back the power over your computer that copy protection took away. You can duplicate every byte of your memory-resident programs up to 128K. You can interrupt a running program, copy it, list it, disassemble it, step and trace, modify it and resume running. The program never knows what happened.

USER FRIENDLY. One simple menu. **NO** parameters. **NO** disk swapping. **NO** booting and re-booting "utility" disks or finding your way through a maze of menus. Back up your single-load programs with one menu and a push of the button—in seconds. Dark Star Systems is a user-friendly company, too. Our knowledgeable, helpful people are happy to answer your questions.

VERSATILE. All backups are automatically BRUNnable files which can be moved to hard disk. State-of-the-art compression lets you stack several backups on one diskette. SNAPSHOT software is in RAM, so it can be updated to keep you ahead of the protection game. Your Snapshot system can never become obsolete.

AND MORE! Call or write for our info packet.

SNAPSHOT COPYKIT: \$159.95

System requirements: Apple II , II + , IIe, Basis 108, Franklin or other lookalike with disk drive.

SNAPSHOT TWO: \$75.00 (through dealers only)

System requirements: Apple II or II + , Franklin 1000 with disk drive. RAMcard required in Apple; specify brand when ordering.

TO ORDER: Add \$3.00 for shipping in US (\$7.50 to Canada, \$15.00 elsewhere). US funds only, please. Send check payable to Dark Star Systems. Mass. residents add 5% tax. VISA and American Express accepted. DEALER INQUIRIES INVITED.

darkStar

SYSTEMS

413-268-7351

R39A SOUTH ST., WILLIAMSBURG, MA 01096

**Snapshot Copykit... the one copy
card that does it all... for less.**

*For use in Apple IIe, II + , and II

*Apple is a registered TM of Apple Computer Inc.

▶ PRODUCT NEWS

Columbia, MO 65205
(314) 449-0941

CIRCLE 562 ON READER SERVICE CARD

▶ SOFTWARE

Paper Graphics

Paper Graphics is a utility for printing high-resolution graphics screens to any printer/interface card combination.

This program lets users print out any portion of a screen in nine magnifications, frame or crop pictures, and even add text and labels. It rotates, flips, mirrors, or inverts graphic screens and varies print intensities for lighter or darker prints.

The program can print several pictures sequentially and automatically and can print both graphics screens for a panorama effect.

Paper Graphics can also pack or unpack pictures. It works with Dow Jones Market Analyzer and other programs that use high-resolution graphics screens. (*List Price: \$49.95*)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; printer
Penguin Software
830 4th Avenue
Geneva, IL 60134
(312) 232-1984

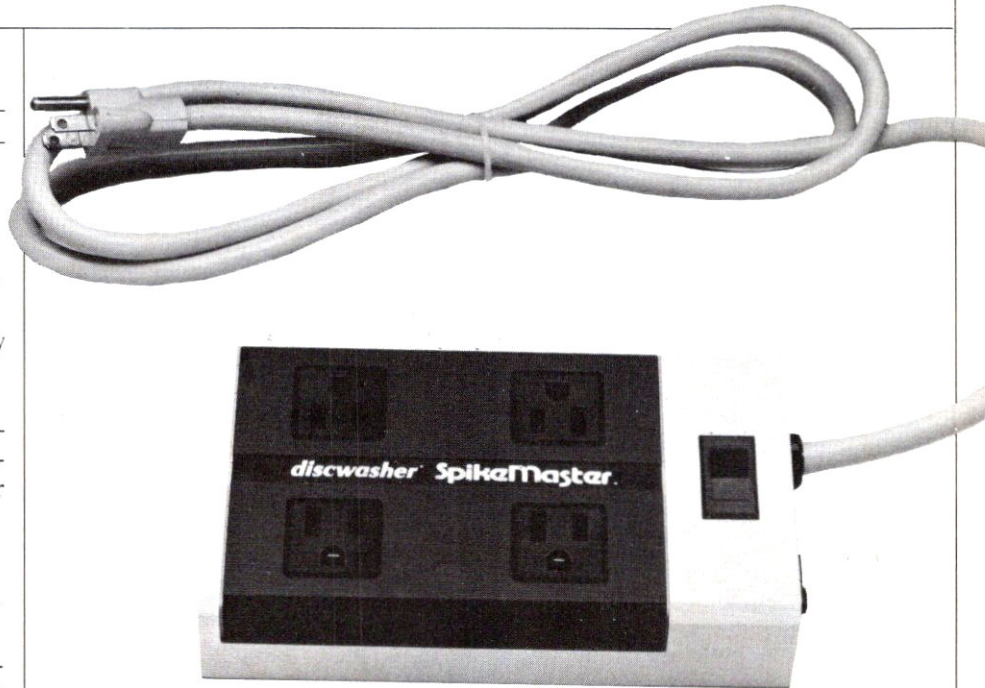
CIRCLE 563 ON READER SERVICE CARD

Bookkeeping System

Bookkeeping is a comprehensive starter package that assists small businesses (up to 50 employees) to computerize their accounting programs. The system includes all the necessary functions to enter and track accounting transactions and to provide financial reports for analysis and auditing.

The system's major functions are Account Maintenance, General Ledger Reports, General Ledger Graphics, Financial Statements, Vendor Maintenance, Check Printing, Housekeeping, and Daily Transactions (General Journal, Cash Disbursements, Daily Sales Journal, and Cash Receipts).

Particularly suitable for small businesses that are oriented toward cash-basis accounting—such as dry cleaners, beauty shops, florists, and bowling alleys—Bookkeeping assumes little or no user experience with computers, and



Discwasher's new Spikemaster safeguards computer hardware and software from electrical surges.

its programs and user manual provide helpful prompts and instructions. (*List Price: \$495*)

Requires: Apple II, II Plus, IIe, or III; 64K RAM; two disk drives; 80-column card
State of the Art, Inc.
3183-A Airway Avenue
Costa Mesa, CA 92646-4618
(714) 850-0111

CIRCLE 564 ON READER SERVICE CARD

MediCard

Lisa MediCard is a medical-billing application designed to operate on the Lisa. MediCard is also available for the Apple II and III. Designed to manage the billing and claim-form preparation for small medical offices, the new application is well suited to such specialties as psychiatry, psychology, and anesthesiology.

The system allows the rapid development of data for billing small patient bases.

The system features a complete monthly billing system and an instant preparation of standard AMA universal claim forms. Patient records can be examined immediately for up-to-the-

moment balances. Users can operate MediCard as they would any other Lisa application, using the mouse, pull-down windows, and screen icons. MediCard operates as a "stationery pad" for complete medical billing. (*List Price: \$349.95*)

Requires: Apple II, III, or Lisa; Visi-Calc; one disk drive; 80-column printer
CMA Micro Computer
Lisa Project Taskforce
55722 Santa Fe Trail
Yucca Valley, CA 92284
(619) 365-9718

CIRCLE 565 ON READER SERVICE CARD

The Krell Turtle Pak

The Turtle Pak for schools (authorized by MIT) is available in 20-pak and 40-pak sizes, containing 20 and 40 disks respectively. Each Turtle Pak also contains Alice in Logoland disks and primer and utility disks with MIT's programs, Dynatrack, Shape Editor, Music Editor, and Sprite Drivers. In addition, each Turtle Pak contains Krell Logo commands wall charts, *Learning with Logo* by Daniel Watt, and the official MIT technical manual, *Logo for Apple II*. (*List Price: \$499.95, the 20*

STOP WAITING WRITE AWAY IS HERE!

If you're tired of word processing software
that takes too long to use
and doesn't do everything you want it to
then you need **WRITE AWAY™**

The most powerful, highest level word processing available for the Apple* — and more. With the new, full-function WRITE AWAY from Midwest Software you get . . .

- Flexibility . . .
WRITE AWAY works with any printer, 80 column cards, and most popular applications programs (Visicalc, pfs, DB Master, and more)
- Speed . . .
super fast file loading (load a 10-page document in less than 18 seconds), 8 easy to use *function keys*—each key can reduce up to 32 characters to a single keystroke to save you time
- Integrated . . .
you can access on-line data bases, bulletin boards, and other sources of information . . . *send memos, letters, telegrams, electronic mail, TELEX, MCI mail with the touch of a button*
- Multi-Function . . .
far beyond standard word processing systems, WRITE AWAY also features mail merge, file translator to create standard text files, unlimited document size, "if . . . then" text selection, displays finished copy, and more

- Easy to learn and Use . . .
screen tutorials, help screen, complete loose-leaf instruction guide with multiple examples, fully indexed and stand-up Command Card

Money Back Guarantee

If WRITE AWAY doesn't save you time and do everything you want it to within 30 days, you'll receive a full refund on your purchase.

ORDER NOW—ONLY \$175.00

To order, call toll-free
1-800-835-2246, ext. 467

 **WRITE AWAY**

Midwest Software Associates
1160 Appleseed Lane
St. Louis, MO 63132
For more information, call
314-997-6470

WRITE AWAY—powerful, fast,
easy to use.

*WRITE AWAY works with any APPLE II, II+ or IIe,
Franklin Ace, BASIS-108

1-800-835-2246

ext. 467

pak; \$899.95, the 40 pak)

Requires: Apple II, II Plus, or IIe; 64K RAM; one disk drive
Krell Software Corp.
1320 Stony Brook Road
Stony Brook, New York 11790
(516) 751-5139

CIRCLE 566 ON READER SERVICE CARD

Terrapin Logo Version 2.0

Terrapin, Inc. has announced Version 2.0 of its Logo language for the Apple II, II Plus and IIe. Significant enhancements over the current Version 1.3 include the addition of six new primitives and several editor commands; improved garbage-collection capabilities; full-function support for all four cursor keys on the IIe; and ability to read program files created under Apple Logo.

Terrapin also has released an extensive Words and Lists chapter in its Logo manual. Topics in the new documentation subset include recursion, interactive graphics, quizzes, word games, and artificial-intelligence programming. In addition, the 142-page document includes over 40 programming projects and solutions. (*List Price: \$149.95, complete Logo package with language disk, full documentation, and utilities disk; \$12.50, Words and Lists chapter; \$20, Version 1.3 update; \$5, Words and Lists chapter*)

Requires: Apple II, II Plus, or IIe
Terrapin, Inc.
380 Green Street
Cambridge, MA 02139
(617) 492-8816

CIRCLE 567 ON READER SERVICE CARD

CustomFONT

CustomFONT, a new utility for use with Apple III word-processing, spreadsheets, and user programs, enhances them with custom characters, symbols, and fonts. Possible applications include special symbols, business logos, complex mathematical formulas, foreign-language characters, and block graphics.

CustomFONT includes built-in file utilities and a file of ready-to-use symbols for technical writing, screen and report formatting, and games. Character design and font-file customization is

accomplished via an interactive graphic interface. ASCII tables and keyboard guides can be printed as an aid to using customized character sets. Special features for developers include commands to create flashing characters and listings of routines to download character sets at run time. CustomFONT is easy to transfer to the ProFile or any other hard disk. On-line help screens and complete documentation ensure ease of use in any application. (*List Price: \$149*)

Requires: Apple III; 256K RAM; hard-disk drive; printer
Swenson Associates, Inc.
45 Newbury Street
Boston, MA 02116
(617) 267-3632

CIRCLE 569 ON READER SERVICE CARD

Educational Software

American Educational Computer, Inc., has introduced home-computer software that follows standard classroom format. The programs have been developed in two series: Easy Reader covers phonics and reading comprehension; and Matchmaker covers vocabulary skills, grammar, U.S. geography, world geography, and Spanish I. Each of the 11 software packages initially offered is bracketed to match appropriate grade and learning levels.

The Matchmaker series contains additional programming space to create tailored drills. When students have mastered 70% of two lessons, they can play a video game before moving on to the next lesson. (*List Price: \$39.95 each*)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive
American Educational Computer, Inc.
2450 Embarcadero Way
Palo Alto, CA 94303
(415) 494-2021

CIRCLE 570 ON READER SERVICE CARD

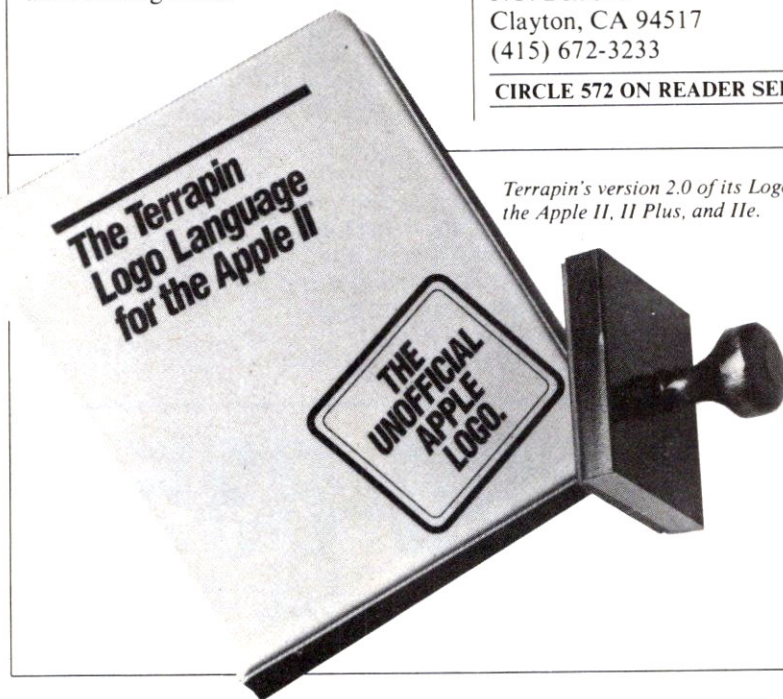
Stock Tracker

This program uses the Dow Jones News/Retrieval service to acquire either daily or historical quotation data. The program then prepares and automatically feeds the data to the Stock Tracker program. The program requires very little operator time. Compiled format permits rapid operation.

Stock Tracker offers technical volume analysis of stock trends, with programmed buy-sell-hold trading signals complemented by graphics and extensive numeric-volume analysis. (*List Price: \$195*)

Requires: Apple II or IIe; auto-dial modem capable of 300-baud transmission
H&H Trading Company
P.O. Box 549
Clayton, CA 94517
(415) 672-3233

CIRCLE 572 ON READER SERVICE CARD



Terrapin's version 2.0 of its Logo language for the Apple II, II Plus, and IIe.

NORTHEASTERN SOFTWARE

UP TO
50%
DISCOUNT

SPECIAL DISCOUNTS

Knoware	72.00
Locksmith 5.0.	73.00
Replay II	110.00
Wildcards	Call
E.D.D. (Best Nibble Copier)	68.00
CIA Files (How to Crack)	Call
Back it up III	56.00
CENTRAL POINT Copy II Plus	28.00
Apple Computers	Call

101 William Henry Drive, Monroe, CT 06468

GAMES		HARDWARE		BUSINESS		EDUCATIONAL		HOME/HOBBY	
Program	Our Price	PRINTERS	Our Price	Program	Our Price	Program	Our Price	Program	Our Price
Centipede	25.00	APPLE		ACTION RESEARCH		APPLE Logo	160.00	BEAGLE	
Dig Dug	25.00	Apple Dot Matrix	553.00	Zardax	150.00	BPI Speed Read	140.00	Alpha Plot	27.00
Starcross	26.00	Apple Daisy Wheel	1,826.00	APPLE		CBS Software	Call	Apple Mechanic	20.00
Suspended	33.00	BROTHER HR 25	775.00	Apple Writer Ite	160.00	COUNTERPOINT SOFTWARE		Beagle Basic	24.00
Zork, I, II, III	25.00	DIABLO		Quick File Ite	80.00	Early Games For Young Children	22.00	Disk Quick	22.00
Witness	33.00	620	850.00	ARTSCI		Fraction Factory	22.00	Doss Boss	16.00
Deadline	33.00	630	1,625.00	Magic Calc	95.00	DAVIDSON AND ASSOCIATES		Double Take	22.00
Planetfall	33.00	DYNAX		Magic Memory	71.00	Word Attack	37.00	Fiext Text	20.00
Enchanter	33.00	DX-15	450.00	Magic Window II	95.00	Math Blaster	37.00	Frame Up	20.00
Infield	33.00	EPSON		ARTWORKS Magic List 3.0	23.00	Speed Reader II	52.00	G P L E	37.00
Ultima III (Exodus)	39.00	FX-80	550.00	BPI General Accounting	298.00	DESIGNWARE		Pronto Doss	20.00
Caverns of Callisto	26.00	FX-100	685.00	BUSINESS SOLUTIONS		Crypto Cube	30.00	Silicon Salad	17.00
Lode Runner	24.00	MX-100	550.00	Incredible Jack	115.00	Creature Creator	30.00	Typefaces	15.00
Choplifter	24.00	IDA		COMPUTER TAX SERVICE		Spellcoper	30.00	Utility City	20.00
Drol	24.00	Prism 80 (Basic)	1,080.00	Money Street	78.00	DLM		BRODERBUND	
Spare Change	23.00	Prism 80 (Full)	1,257.00	CONTINENTAL SOFTWARE		Alien Addition	24.00	Bank Street Writer	47.00
Maze Craze	30.00	Prism 132 (Basic)	1,240.00	The Home Accountant	48.00	Medior Multiplication	24.00	Bank Street Speller	48.00
Eagles	30.00	Prism 132 (Full)	1,675.00	The Tax Advantage	45.00	Demolition Division	24.00	CHALKBOARD	
Queen of Hearts	26.00	JUKI 6100	450.00	FCM/FL	65.00	Alligator Mix	24.00	Power Pad	81.50
Fortress	26.00	MANASMAN TALLY		F.A.S.T.	67.00	Dragon Mix	24.00	Starter Kit	39.00
Pro Tour Golf	30.00	160L	620.00	DICKENS DATA SYSTEMS		EDU-WARE		DECISION SUPPORT	
Ring Side Seat	30.00	180L	805.00	The Wall Street Plotter	94.00	Compu-Read	20.00	The Accountant	95.00
Cosmic Balance II	29.00	1602P	1,325.00	The Super Plotter	53.00	Compu-Math	34.00	MICROLAB SAT English I	21.65
Bomb Alley	41.00	OKIDATA		DOW JONES SOFTWARE		SAT Word Attack Skills	34.00	MICROSOFT	
Geopolitique 1990	29.00	92P	470.00	The Market Analyzer	275.00	PSAT Word Attack Skills	34.00	Applesoft Compiler	126.00
Epidemic	29.00	93P	700.00	Market Manager	230.00	Spelling w/Reading Prmr.	27.00	Typing Tutor II	18.00
North Atlantic 86	43.00	PROWRITER		FOX & GELLER Quickcode	189.00	Algebra 1 2 3 or 4	27.00	MONGRAM Dollars & Sense	72.00
Germany 1985	41.00	8510AP (ProWriter I)	365.00	HAYDEN Pie Writer 2.2	99.00	Algebra 5 & 6	37.50	PENGUIN Graphics Magician	41.00
Broadsides	29.00	1550AP (ProWriter II)	655.00	HOWARD SOFTWARE SERVICES		HARCOURT BRACE JOVANOVICH		SOFTRONICS	
Flight Simulator I	25.00	F-10 (40 cps)	1,125.00	Real Estate Analyzer II	120.00	Computer SAT	60.00	Softerm I	97.50
Flight Simulator II	39.00	F-10 (55 cps)	1,425.00	HOWARD W. SAMS		HAYDEN SOFTWARE		Softerm II	140.00
Night Mission Pinball	25.00	SMITH CARONA TP-1	499.00	Financial Facts	47.00	Micro Division	22.00	SOFTWESTERN DATA	
Wizardry I	33.00	STAR MICRONICS		Instant Recall	47.00	Micro Multiplication	22.00	ACIL Express Pro	85.00
Wizardry II (Night of Diamonds)	24.00	Gemini 10X	320.00	KENSINGTON		Micro Typing II	22.00	Merlin Assembler	47.00
Wizardry III (Legacy of Lyligamyn)	27.00	Gemini 15X	409.00	Format II Enhanced	105.00	Micro Subtractions	22.00	Merlin Combo Pack	82.00
Police Artist	23.00	Power Type	400.00	LIVING VIDEO Think Tank	124.00	Micro Addition	22.00	TURNINGPOINT Time is Money	70.00
Wizprint	19.00	TRANSTAR		MEGAHAUS		LEARNING COMPANY		VIRTUAL COMBINATICS	
Crypt of Medea	23.00	120	440.00	MegaFinder	108.00	Ricky's Boots	34.00	Micro Cookbook II/IIe	27.50
Rescue Raiders	23.00	130	605.00	MegaSpell	45.00	Gertrudes Puzzles	30.00	ACCESSORIES	
Zaxxon	27.00	140	1,235.00	MegaWriter	47.00	Gertrudes Secrets	30.00	Program	Our Price
Pooyan	23.00	315	470.00	MICROPRO		Bumble Plot	27.00	CORVUS Hard Disks	Call
Genesis	23.00	Pics Card	96.00	Calcastar	118.00	Bumble Games	27.00	EPS Keyboard	275.00
Spy's Demise	13.50	DISK DRIVES		Infostar	320.00	Juggles Rainbow	20.00	HAYES Apple II:	
The Spy Strikes Back	13.50	APPLE Apple Add On	350.00	Spellstar	162.00	Magic Spell	24.00	Mach I:	
The Quest	13.50	MICRO SCI		Wordstar	320.00	MICRO LAB		Mach II:	31.00
Minit Man	13.50	Disk Contr. for A2	75.00	Wordstar W/Z Card	540.00	English SAT	22.00	Mach III:	38.95
Bouncing Kamangas	13.50	Disk Contr. for A40/70	75.00	Word/Spell/Mail	175.00	Math SAT	22.00	Apple IIe:	
Coveted Mirror	13.50	A2	230.00	MICROSOFT Multiplan		PROGRAM DESIGN		Mach II:	35.00
Mr. Cool	30.00	A2 w/controller	295.00	MID WEST SOFTWARE		Reading Comp.	18.00	Mach III:	42.95
Congo Bongo	28.00	A40	295.00	Write Away	126.00	Vocabulary Builder	18.00	HAYES	
Frogger	24.00	A40 w/controller	365.00	MUSE Supertext-Pro	70.00	One: Beginning	18.00	Micromodem IIe/w Smart Com I	250.00
Sammy Light Foot	27.00	A70	365.00	PEACHTREE Peach Calc	92.00	Two: Advanced	18.00	KENSINGTON System Saver	65.00
Time Zone	65.00	A70 w/controller	445.00	QUARK		The New Step by Step	65.00	KOALA Koala Pad	90.00
Ultima II	41.00	RANA		Lexicheck/Word Juggler IIe	155.00	Step by Step II	65.00	KRAFT Joystick	40.00
The Dark Crystal	27.00	Disk Controller	95.00	SENSIBLE SOFTWARE		SCARBOROUGH SYSTEMS		MICROSOFT	
Quest For Tires	26.00	Elite I	275.00	Report Card	82.00	Songwriter	30.00	Ram Card	75.00
Super Taxman II	18.00	Elite I w/controller	360.00	Sensible Speller	82.00	Picturewriter	30.00	Softcard	238.00
Stellar 7	24.00	Elite II	470.00	SIERRA ON-LINE		SIERRA ON-LINE		NOVATION Apple Cat II	259.00
Fax	22.00	Elite II w/controller	535.00	The Dictionary	65.00	Learning with Leeper	24.00	ORANGE MICRO Grappler +	120.00
Jumpman	30.00	Elite III	590.00	The General Manager II	149.00	Bop-A-Bet	19.00	SATURN 128K Board	375.00
Eating Machine	37.00	Elite III w/controller	665.00	Homeward	37.50	Dragons Keep	20.00	SPIES LABS	
Advanced Black Jack	37.00	MONITORS		Screenwriter IIe	82.00	Troll's Tale	20.00	Super MX Interface Card	157.00
Castle Wolfenstein	20.00	Color I +	315.00	SILICON VALLEY		SPINNAKER SOFTWARE		STREET ELECTRONICS Echo II	124.00
Caverns of Frietag	20.00	Color II +	440.00	The Handlers Package	90.00	Trains	28.00	SWEET MICRO Mockinboard	86.00
Spitfire Simulator	26.00	Color III	350.00	List Handler	36.00	Facemaker	23.00	SYNETIXS Super Sprite	320.00
Air Sim III	29.00	DVM II or DVM III RGB Interface	139.00	The Word Handler II	42.00	Snooper Troops 1 & 2	30.00	TG	
Sargon II	25.00	DVM 80E RGB Interface	149.00	SOFTLINK Practical Acctnt	105.00	Story Machine	24.00	Joystick II/IIe	45.00
Sargon III	37.00	Amdek 300G Hi-Res	149.00	SOFTWARE PUBLISHING		Kindercamp	20.00	Paddles	28.00
Cubit	29.00	Amdek 300A Amber	160.00	PFS: File	82.00	Delta Drawing	41.00	Select A Port	35.00
Miner 2049er	26.00	NEC 12" Color	299.00	PFS: Graph	82.50	Kids on Keys	21.00	TRACKHOUSE Key Pad	150.00
Dino Eggs	30.00	AMDEK		PFS: Report	82.50	Alphabet Zoo	20.00	VERSA EZ Port II	28.00
Death in the Caribbean	26.00	Color I +	315.00	PFS: School Record Keeper	105.00	SUBLOGIC		VIDEX	
Critical Mass	26.00	Color II +	440.00	PFS: Write IIe	82.50	Whole Brain Spelling	24.00	Ultratrem	295.00
Masquerade	20.00	Color III	350.00	STONEWARE		TERRAPIN Logo	108.00	Videoterm	245.00
Bats in the Belfry	20.00	DVM II or DVM III RGB Interface	139.00	D B Master Ver. 4	230.00	XEROX		ZOOM TELEFONICS	
Mad Rat	16.00	Amdek 300G Hi-Res	149.00	VISICORP		Sticky Bear Numbers	27.00	Networker	105.00
Diamond Mine	22.00	Amdek 300A Amber	160.00	Visicalc 3.3	164.00	Sticky Bear ABC	27.00	Netmaster	65.00
Star Maze	26.00	NEC 12" Color	299.00	Visiplot	139.00	Sticky Bear Bop	27.00	Combo	145.00
Odesta Chess 7.0	52.00	TAXAN		Visitrem/Visiplot	198.00	Sticky Bear Opposites	27.00	MEDIA	
How about a nice game of Chess	23.00	12" AMBER	135.00			Sticky Bear Shapes	27.00	Program	Our Price
The Serpent's Star	27.00	210 Color	299.00			Sticky Bear Basket Bnc.	27.00	ELEPHANT 5 1/4 SSSD	18.50
Rendezvous	27.00	RGB Vision III	450.00					MAXELL 5 1/4 SSSD	28.00
Titan Empire	24.00	RGB-II Interface	140.00					VERBATIM 5 1/4 SSSD	27.80
Beneath Apple Manor	20.00								
I.Q. Baseball	19.00								
Zero Gravity Pinball	20.00								

NO ADDITIONAL CHARGES FOR CREDIT CARD ORDERS



For Fast Delivery send cashier's check, certified check or money order. Personal and company check allow 3 weeks to clear. Shipping - Software (\$2.50 minimum). C.O.D. add an additional \$1.75. Shipping - Hardware (please call). Alaska, Hawaii, Canada, PO, APO and FPO \$5.00 minimum. Foreign orders - \$15.00 minimum and 15% of all orders over \$100. Mastercard & Visa (include card # and expiration date). Connecticut residents add 7.5% sales tax. We ship same day for most orders. Prices subject to change without notice. School purchase orders accepted. All returns must have a return authorization number. Call 203-268-1850 to obtain one before returning goods for replacement.

ORDERS ONLY
TOLL FREE - 7 DAYS/WK
1-800-382-2242
For Inquiries and Connecticut Orders Call
(203)268-1850

If something you would like is not listed, just call. If we don't have it, we can get it.

CIRCLE 330 ON READER SERVICE CARD

▶ PRODUCT NEWS

Polywriter

Polywriter, a music-writing program from Passport Designs, Inc., provides printouts from the Soundchaser keyboard in the following score formats: single treble line, single bass line, piano score, choral score, treble clef with piano, base clef with piano, and full orchestral score.

Polywriter prints in standard music notation and accurately handles note division, seconds, accidentals, ties, 8vas, flags and beams, split stemming, triplet brackets, rests, any time signature (up to 15 including complex and asymmetrical), any key signature, transposition up or down nine half steps, and logical allocation of space. Polywriter has a full-scale editor that allows for all standard features as well as lyrics and chord symbols. (List Price: \$595)

Requires: Apple II, II Plus, or IIe; 64K RAM; Soundchaser Basic System; one disk drive; monitor; interface card; dot-matrix printer with graphics
Passport Designs, Inc.

625 Miramontes Street, Suite 103
Half Moon Bay, CA 94019
(415) 726-0280

CIRCLE 571 ON READER SERVICE CARD

Competitive Edge

Developed to assist real-estate agents, brokers, bankers, accountants, developers, and private investors, the Competitive Edge can analyze complex purchase offers and determine the best terms from the seller's point of view. The program asks a series of questions to prompt users to enter the appropriate data. It provides a short narrative summary of each evaluation. (List Price: \$500; \$10, demonstration kit)

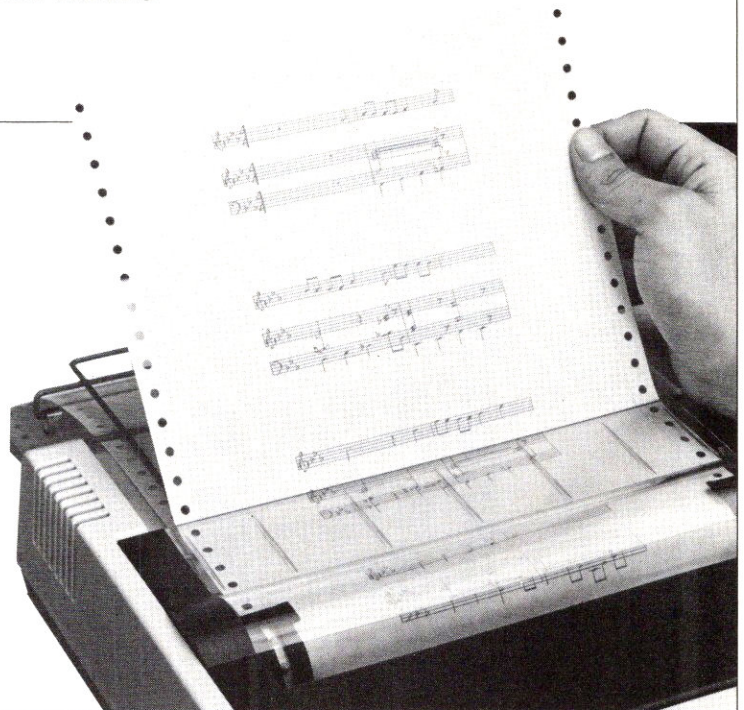
Requires: Apple II Plus, IIe, or III; 64K RAM; CP/M; 5¼- or 8-inch disk drive.
Softronic, Inc.
100 South King Street, Suite 270
Seattle, WA 98104
(206) 587-0688

CIRCLE 573 ON READER SERVICE CARD

Tax Advantage

Tax Advantage, Continental Software's latest tax-preparation-aid package, interfaces with the company's household-finance package, Home Accountant.

*Polywriter, from
Passport Designs*



Users can transfer data directly from their Home Accountant database to Tax Advantage without manually reentering the information. The interface portion of Tax Advantage will take totals from tax-significant Home Accountant budget categories and automatically enter these totals in the appropriate spots on the Tax Advantage 1040 form, and on related schedules.

Tax Advantage supports form 1040, schedules A, B, C, D, E, G, W, and SE, and form 4562. All program functions are menu-controlled and users can enter them with a few easily learned keystrokes. (List Price: \$69.95)

Requires: Apple II Plus or IIe; 48K RAM; one disk drive
Continental Software
11223 South Hindry Avenue
Los Angeles, CA 90045
(213) 417-8031

CIRCLE 574 ON READER SERVICE CARD

Software Fitness Program

Software Fitness Program consists of seven interactive accounting applications and a complementary report writer and data formatter. The programs run in Science Management Corporation's (SMC) Business BASIC under Microsoft's multiuser XENIX operating system.

The accounting series, known as the Software Fitness Program, includes modules for accounts receivable with billing and sales-analysis functions, ac-

counts payable, general ledger, inventory, payroll, sales-order processing, and a fully integrated job-cost system.

The report writer, called The Team Manager, creates custom reports using data from the accounting applications. It can format data to be compatible with many popular word-processing, spreadsheet, and database-management systems.

These products, the first Lisa applications to run under XENIX, add the multiuser dimension provided by that operating system to the Lisa's capabilities.

One Lisa system can act as a "host" for Apple II, III, or other Lisa personal computers, or for several types of terminals. This allows users in different locations to use the software and information base resident in the host Lisa system. (List Price: \$695)

Requires: Apple III or Lisa; Microsoft CP/M SoftCard; ProFile hard disk; 64K RAM; 80-column printer
Open Systems, Inc.
430 Oak Grove
Minneapolis, MN 55403
(612) 870-3515

CIRCLE 575 ON READER SERVICE CARD

Netmaster

Netmaster, a high-speed communications program for the Apple II family of computers, operates with 300 baud modems and "talks" to other communications software.

SCRG

SWITCH-A-SLOT



The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. 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.

- Allows up to four peripheral cards to be plugged into one peripheral slot.
- User selects desired card by front panel rotary switch.
- Only selected card draws power.
- Plugs into any peripheral slot.
- Saves wear and tear on delicate connectors.
- 18" cable connects Switch-a-slot to computer.

New—resistive terminations for better response

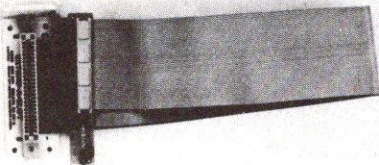
\$179.50 **36" Cable \$189.50**



SWITCH-A-SLOT and **EXTEND-A-SLOT** work well with all slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. These products may be incompatible with some alternate processor cards.



EXTEND-A-SLOT



The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

The perfect accessory for:

Owners of large numbers of I/O expansion cards—keep your frequently used cards installed. Use the **EXTEND-A-SLOT** for the others.

Technicians—easy access to test points on accessory cards under actual operating conditions.

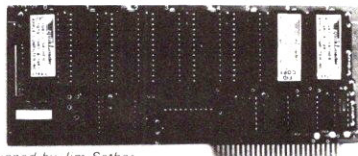
Experimenters—make easy changes to cards while card is installed.

EASY TO USE—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

\$34.95

NEW PRODUCT

quikLoader



Designed by Jim Sather

SPEED

The quikLoader is the *fastest* way to load programs. **BAR NONE!** Applesoft, Integer, or machine language programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. The quikLoader operating system can keep track of over 250 programs stored in **PROMs** (Programmable Read Only Memory). The user simply transfers any of these programs to PROM using the instructions packed with the unit, and any PROM programmer, or we will provide this service.

CONVENIENCE

How many times have you started to work with a frequently used program, only to find that you have misplaced the disk, or worse, had the disk damaged, or the dreaded "I/O ERROR" message flash on the screen. With the quikLoader, these nightmares can be a thing of the past. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly. If you do need to use standard disks, the quikLoader even speeds up that process. For example, to catalog a disk, just press ctrl-C Reset. To run the "HELLO" program, press ctrl-H Reset Other "one-key" commands include entering the monitor, booting the disk, calling up the mini-assembler, etc. The major difference between the

quikLoader and the other ROM cards is the complete operating system (in PROM). This enables you to get the quikLoader catalog on the screen (by pressing ctrl-Q Reset), allowing you to see what programs are available. Loading or running of the desired program requires one keypress. Program parameters, such as starting address and length of machine language programs can be seen on the catalog screen, if desired.

VERSATILE

The quikLoader will accept any of the popular PROMS available on the market, 2716, 2732, 2764, 27128 and 27256. These types may be freely intermixed on the card. Long programs can take up more than one PROM, or several short programs may be stored on one PROM. The quikLoader operating system even handles multiple cards, so you can easily double or triple the amount of PROM memory available. The ultimate memory capacity of one card is 256K, so many frequently used programs and utilities can be stored. We even start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

INCREASED DISK CAPACITY

Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 10% additional space for programs and data on your disks.

SYSTEM REQUIREMENTS

The quikLoader plugs into any slot of the APPLE][+ or][e. If used in a][+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

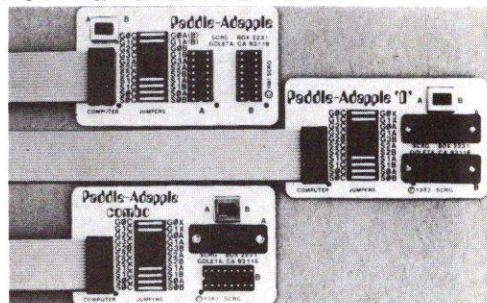
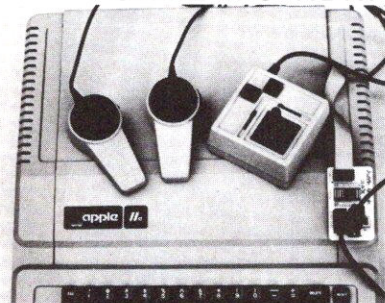
\$179.50

DOS, INTEGER BASIC, FID, and COPYA are copyrighted programs of APPLE COMPUTER, INC. licensed to Southern California Research Group to distribute for use only in combination with quikLoader.

NOW AVAILABLE: Beagle Bros. double-take for quikLoader. More programs coming soon.

Paddle-Adapple

GAME I/O ADAPTOR and EXTENDER



- Works with all Apple compatible joysticks, paddles and other I/O devices.
- Select one of two devices or ...
- Use 4 paddles simultaneously.
- Unique "Jumpers" socket allows you to configure to meet your needs.
- BPI™ users can have BPI™ device and paddles plugged in simultaneously. (**Paddle-Adapple** and **Paddle-Adapple Combo** only).
- Gives you four push-button inputs.
- Supports shift key modification.
- Exchange X & Y joystick axis.
- Small and compact — adheres to computer with supplied foam tape.
- All Strobes, annunciators and power available on all 16 pin connectors.
- Supplied with 18" cable.

\$29.95

The **Paddle-Adapple** has two 16 pin sockets

The **Paddle-Adapple "D"** works with the subminiature D connectors.

The **Paddle-Adapple Combo** has one 16 pin socket and one subminiature D connector.

D Manual controller

This hardware product gives the user complete control over all I/O functions in the range \$COOD through \$COFF. For example, you may switch between text and graphics, hi-res and low-res; turn disk drive on and off, etc.

D Manual controller allows all this while programs are running. Commands can be issued (via push-buttons) in the middle of a program, and the desired result occurs immediately. The process used (known as **CYCLE STEALING**) allows immediate execution of these commands without interfering with the normal operation of the program. The card is slot independent, and is connected to a control panel by a four foot cable.

\$89.50

See us at Chicago Userfest, May 3-6, and Denver Softwest, May 22-24

SIX MONTH WARRANTY • TEN DAY RETURN PRIVILEGE
TOLL-FREE ORDER LINES

in CA (800) 821-0774

(800) 635-8310

all other states (Including AK, HI, VI, & PR)
Information & technical questions: (805) 685-1931

Available at your local dealer or direct from:
SOUTHERN CALIFORNIA RESEARCH GROUP
Post Office Box 2231-P
Goleta, CA 93118
(805) 685-1931

Add \$2.50 for shipping,
\$5.00 outside U.S.A. &
Canada, CA add tax.

VISA, MASTERCARD accepted APPLE is a trademark of APPLE COMPUTER, INC.

▶ PRODUCT NEWS

During communication with another computer, files transmit with full error-correction and at 3 to 5 times the speed of other communications programs. The software receives and transmits any DOS 3.3 file and provides a 40K buffer from 64K RAM to record on-line conversations.

The program diskette, packaged in a vinyl-covered three-ring binder, is shrink-wrapped for shelf or counter display. The instruction manual includes step-by-step procedures for recording and saving conversations and transferring files, disk-to-disk, over phone lines. (*List Price: \$79, Netmaster; \$179, with Networker modem and membership to The Source database*)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive

Zoom Telephonics, Inc.
207 South Street
Boston, MA 02110
(617) 423-1072

CIRCLE 568 ON READER SERVICE CARD

Polymaps

Polymaps is a tool for business analysts and marketing and government planners who wish to produce maps for analysis and presentation.

The polygon editor and database manager provide file-data input. The program contains an integrated statistical package to generate cross tabs, breakdowns, descriptive statistics, frequencies, and correlations. Polymaps also includes bar, pie, line and surface

charts. You can output via Apple II graphics, Houston Instruments and Hewlett-Packard plotters, or any printer that uses ASCII characters. (*List Price: \$100; \$185, after 1/15/84*)

Requires: Apple II, II Plus, IIe, or III in the Emulation mode; 48K RAM; one disk drive

Community Research & Information Systems
Box 1280
Ripley, NY 14775
(716) 736-4100

CIRCLE 577 ON READER SERVICE CARD

Stockpak II

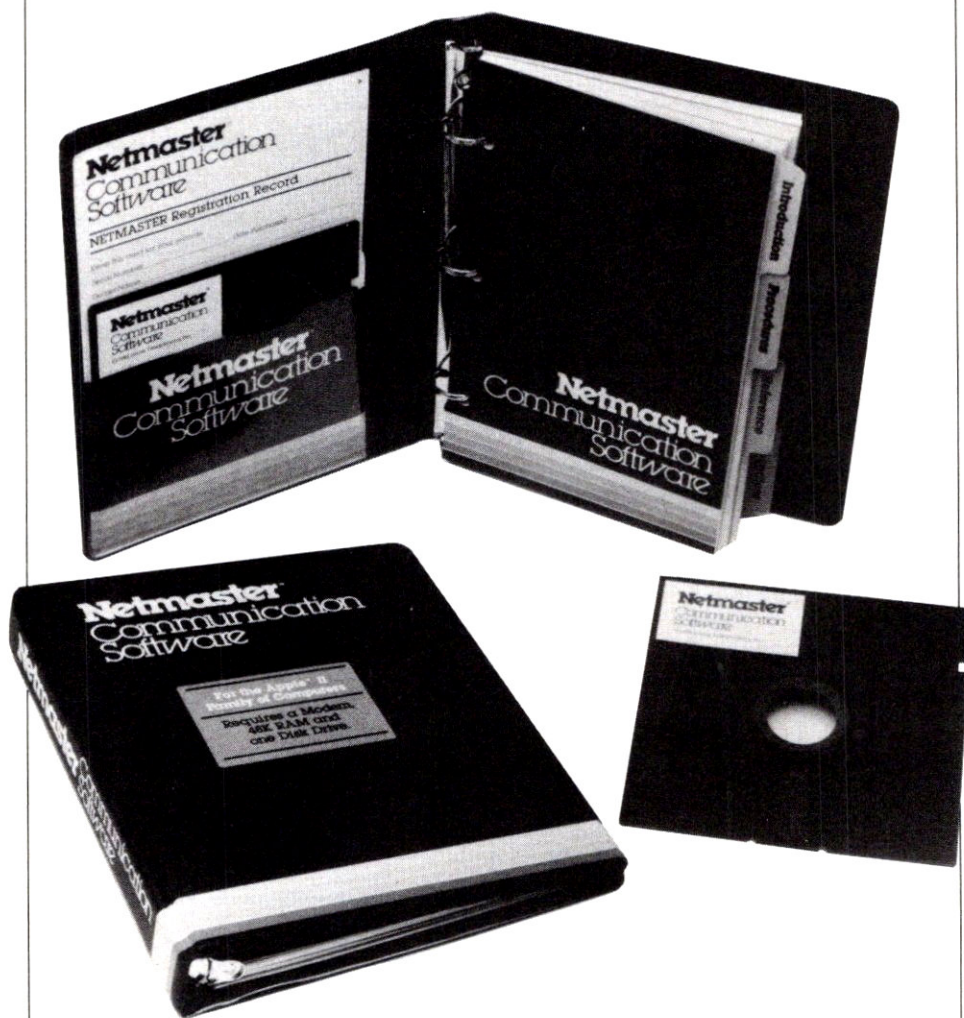
Stockpak II is a fundamental-analysis software system that is available on diskettes and designed for an Apple II computer.

The system enables investors with personal computers to access information about thousands of corporations, construct graphs to compare groups of companies, and create screens based on their own criteria.

Stockpak II provides information in two forms: a Lookup and Comparison mode with which investors can call up information on any of 4500 companies through their ticket symbols; and a Screening mode that matches users' criteria with the various companies in the database.

The more than one hundred items of information available on the 4500 companies include:

- Each company's S&P Stock Ranking, industry group, and shares outstanding
- Past, present, and estimated earnings per share; five-year compound-earnings growth rate; and annual percentage change
- Amount, yield, and percent change in the last five years of dividends and ex-dividend dates
- Past and present company sales figures and percent of change from prior year
- Month-end price and volume, quarterly price history, recent high and low prices, and beta
- Balance-sheet statistics including assets, liabilities, debt, and net income
- Performance ratios such as debt-



Zoom Telephonics' Netmaster Communications program



COMPUTER DISCOUNT PRODUCTS — SINCE 1977 —



HUGE Inventories of APPLE & IBM Products IN STOCK
★ ASK ABOUT OUR FAIR PRICE POLICY — IT'S GUARANTEED! ★

koala
TOUCH PAD
\$85.99

Apple, Atari,
Commodore, IBM

For Other
Koala Ware \$Call



CDP SPECIALS

16K RAM CARD	39.99
POWER STRIP w/Surge	17.99
APPLE FAN w/Surge, 2 Outlets	39.99
PAR. PRINTER CARD & CABLE	39.99
16K UPGRADE 4116 200 NS (Set/8)	9.99
64K UPGRADE 4164 200 NS (Set/9)	79.99

VCR TRAINING TAPES \$CALL

DISKETTES

DYSAN 5" SS/DD (10)	31.99
DYSAN 5" SS/DD (100)	299.99
DYSAN 5" DS/DD (10)	38.99
DYSAN 5" DS/DD (100)	369.99
MAXELL 5" SS/DD (10)	27.99
MAXELL 5" SS/DD (100)	259.99
MAXELL 5" DS/DD (10)	37.99
MAXELL 5" DS/DD (100)	359.99
VERBATIM 5" SS/DD (10)	24.99
VERBATIM 5" SS/DD (100)	229.99
VERBATIM 5" DS/DD (10)	36.99
VERBATIM 5" DS/DD (100)	349.99

EDUCATIONAL SOFTWARE SPECIAL

Additional 10% OFF
with order of any 5
educational programs
from DLM, EDUWARE
LEARNING COMPANY
and SPINNAKER.



SPINNAKER

ALPHABET ZOO	19.99
DELTA DRAWING	32.99
FACEMAKER	21.99
FRACTION FEVER	21.99
HEY DIDDLE	19.99
KINDERCOMP	19.99
MOST AMAZING THING	26.99
RHYME & RIDDLE	26.99
SNOOPER TROOPS I & II	27.99
STORY MACHINE	21.99

ALL OF ABOVE 226.99

APPLE SOFTWARE

BPI (GL. AP. AR. PAY. INV)	ea274.99
BRODERBUND Arcade Machine	39.99
Bank Street Writer	44.99
Drol	24.99
Loderunner	24.99
CENTRAL POINT Copy II +	25.99
DATAMOST Aztec	26.99
DATASOFT Zaxxon	24.99
DLM Alien Addition	Sch - 37.99, H - 27.99
Alligator Mix	Sch - 37.99, H - 27.99
Demolition Division	Sch - 37.99, H - 27.99
Dragon Mix	Sch - 37.99, H - 27.99
Meteor Multiplication	Sch - 37.99, H - 27.99
Minus Mission	Sch - 37.99, H - 27.99
Verb Viper/Word Invasion	ea377.99
Word Man/Word Master	ea377.99
Word Radar/Spelling Wiz	ea377.99
EDUWARE Algebra I-III	31.99
Counting Bee	23.99
Decimals 3.0	39.99
Fractions 3.0	39.99
Hands on Basic	61.99
PSAT Word Attack	39.99
SAT Word Attack	39.99
HAYDEN Piewriter	94.99
Sargon II	24.99
INCREDIBLE JACK	129.99
Jack Report	74.99
KENSINGTON Format II	126.99
L&S Crossword Magic	39.99
LEARNING CO Bumble Games	26.99
Bumble Plot/Magic Spell	ea26.99
Gertrudes Puzzle/Secret	ea29.99
Juggles Rainbow	19.99
Moptown Parade/Hotel	ea26.99
Rocky's Boots	34.99
MASTERTYPE	29.99
MICROLAB Miner 20-49er	27.99
MICROSOFT A.L.D.S.	75.99
Multipan	165.99
Multitool Budget	109.00
Multitool Financial Stmt.	69.99
ODESTA Chess	45.99
Odin	37.99
PENGUIN Graphics Magician	38.99

ACCESSORIES

FLIPIN FILE (original)	17.99
FLIPIN FILE w/Locktray (25)	17.99
FLIPIN FILE w/Locktray (50)	27.99
HAYES 300 Baud Smartmodem	199.99
1200 Baud Smartmodem	474.99
LIBRARY CASE	1.99
KENSINGTON PC Saver	29.99
NOVATION 103 Smart Cat	169.99
103/212 Auto Cat	399.99
J Cat	99.99
Access 123	469.99
Cat Modem	135.99
Expansion Modem	29.99
PRINTERS C-I/OH	379.99
Epson FX80	549.99
Epson RX80	349.99
Okidata 82-93	\$CALL
PRINTER STAND Sm (pixlgis)	24.99
PRINTER STAND Lg. (pixlgis)	29.99
RIBBONS-Brother	\$Call
MK & FX 100	4.99
OKI 82, 83, 92, 93 & Gemini	34.99

**FINGERPRINT Epson Upgrade
RX, FX, MK 44.99**



1/2 Height DS/DD Drive	239.99
ALPHA Typefaces	79.99
ASHTON TATE dBase II	429.99
Friday	184.99
Encyclopedia	59.99
AST Combo Plus	309.99
Six Pack Plus	299.99
BRODERBUND Serpentine	26.99
Logo Runner	24.99
CAI Masters	ea31.99
Subjects	ea16.99
CENTRAL POINT Copy II PC	25.99
EDUWARE Algebra I	29.99
HAYDEN Piewriter	129.99
HAYES 1200B Modem	439.99
KRAFT Joystick	44.99
LIFETREE Volkswriter	119.99
MASTERTYPE	26.99
LOTUS 1-2-3	349.99
MICROLAB Miner 20-49er	27.99
MICROSOFT Mouse	129.99
Multipan	165.99
Multitool Budg.	109.99
Multitool Financial Stmt.	69.99
Word	289.99
Word w/Mouse	319.99
NORTON Utilities	59.99
PC CRAYON	49.99
PC TUTOR	47.99
PFS Write	109.99
File	109.99
Report	109.99
Graph	109.99
POOL 1.5	27.99
SIERRA ON-LINE Frogger	29.99
SIRI TECH Wizardry	44.99
SUBLOGIC Pinball	23.99
TG Joystick	44.99
TITAN 64K BOARD	499.99
VISICORP Visicalc or Visidex	164.99
Visfile, Schedule, Trend/Plot	ea199.99
Visilink	\$CALL
Visispell	179.99
Visword	269.99

PLANTRONICS ColorPlus 375.99



ALPHA PLOT	24.99
APPLE MECHANIC	19.99
BEAGLE BASIC	24.99
DOS BOSS	15.99
DOUBLE TAKE	24.99
FLEX TEXT	19.99
FRAME-UP	16.99
PRONTO DOS	19.99
TIP DISK #1	14.99
TYPEFACES	14.99
UTILITY CITY	19.99

ALL OF ABOVE 211.99

Continental

APPLE GRAPHICS BOOK	14.99
CPA (GL. AP. AR. PAY)	ea149.99
FCMFL 1st CLASS MAIL (AP)	61.99
FCMFL 1st CLASS MAIL (IBM)	71.99
HOME ACCOUNTANT+(IBM)	84.99
HOME ACCNT.+(KAYPRO, OSB)	59.99
HOME ACCNT.+(TI PRO)	119.99
PROPERTY MANAGEMENT	295.99
TAX ADVANTAGE (Ap)	39.99

**ULTRAFILE (IBM) 155.99
HOME ACC'NT (AP) 44.99**

KENSINGTON MICROWARE



SYSTEM SAVER

- Surge Suppression
 - Fits Apple Stand
 - Dual Outlet
 - U.L. Listed
 - Great Gift
- \$ 65**

INFOCOM

DEADLINE	32.99
ENCHANTER	32.99
PLANETFALL	32.99
SUSPENDED	32.99
WITNESS	32.99

**STARCROSS
ZORK I, II, III ea 24.99**

APPLE HARDWARE

AUTO REPEAT KEY	19.99
BASIC 108	\$CALL
DAN PEAR Lower Case 1 (rev 1-6)	25.99
Lower Case 2 (rev 7)	19.99
DARK STAR Snapshot II	65.99
EASTSIDE Wildcard II	109.99
FOURTH DIMENSION Drive	219.99
HAYES Micromodem I/II	\$CALL
KOALA PAD	85.99
KRAFT Joystick	39.99
Paddles	31.99
LEGEND 128K Ram	359.99
MICRO-SCI A-2 Drive	219.99
MOUNTAIN CPS Card	159.99
Ramplus + 32K	159.99
NOVATION Applecat II	249.99
Applecat Upgrade 1200 Baud	309.99
ORANGE MICRO Grappler +	114.99
Bufferboard	119.99
Buffered Grappler +	179.99
PADDOLE ADAPPLE	24.99
SATURN 128K Ram	379.99
Accelerator II	444.99
Neptune 64K	199.99

ALS CP/M 3.0 259.99



FROGGER (Ap)	21.99
GENERAL MANAGER	46.99
HOME WORD	49.99
SCREENWRITER II	81.99
ULTIMA II	36.99

**BC QUEST FOR TIRES
OILS WELL NEW/ \$CALL**

Videx

CHARACTER ROMS	24.99
ENHANCER II	99.99
FUNCTION STRIP	34.99
HARDSWITCH	16.99
MICROMODEM CHIP	24.99
PSID	169.99
PRE-BOOTS Apple Writer	14.99
Apple Writer for Ultraterm	23.99
Visicalc	39.99
Visicalc/Memory Expansion	71.99
Visicalc for Ultraterm	54.99
SOFTSWITCH	25.99
ULTRACALC	\$CALL
VIDEOTERM w/SS + INV	219.99

ULTRATERM 249.99



MicroPro.

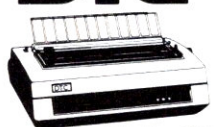
MAILMERGE	139.99
SPELLSTAR	139.99
WORDSTAR PRO	389.99

INFOSTAR & WORDSTAR ea. 259.99

MONITORS

APPLE II 12" Green	159.99
PRINCETON RGB HX-12	485.99
TAXAN 12" Amber 18 mh	129.99
TAXAN 12" Green 18 mh	119.99
USI Pi 1 9" Green 20 mh	99.99
USI Pi 2 12" Green 20 mh	129.99
USI Pi 3 12" Amber 20 mh	139.99
USI Pi 4 9" Amber 20 mh	109.99
USI 1400C Color Composite	289.99

TAXAN 420 RGB 499.99



Sheet Feeder 599.99
Tractors 129.99

380 Z LETTER QUALITY DAISY WHEEL PRINTER

999.99

- 48K Buffer
- 32 CPS
- Graphics
- 10, 12, 15 Pitch
- Proportional Spacing

Cable (Please Specify) 49.99
NEW! Stylewriter 699.99

MAIL & PHONE ORDERS:

860 S. Winchester Blvd.
San Jose, CA 95128
(408) 985-0400

SAN FRANCISCO
1230 Market St.
San Francisco, CA 94102
(415) 626-2244

SAN JOSE
860 S. Winchester Blvd.
San Jose, CA 95128
(408) 985-0401

SAN MATEO
4228 Olympic Ave.
San Mateo, CA 94403
(415) 571-1658

MON-FRI 10AM-7PM • SAT-SUN-HOL 10AM-5PM • San Jose Store Open Daily At 8AM

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- International Orders Welcome
- Min. UPS Chg. \$4 + Ins.
- Min. US Postal Chg. \$10
- P.O.'s Welcome - Call First



to-equity, payout, return-on-book, price-to-earnings, and current.

Subscribers receive one program diskette and one or more database diskettes, which are updated monthly, plus a data-integrity card that enables users to make unlimited backup copies of their diskettes and provide access to the diskettes. Database diskettes presently available are:

1. Composite—1500 selected companies from New York and American stock exchanges and from the Over-the-Counter market
2. New York Stock Exchange—1500 companies
3. American Stock Exchange—800 companies
4. Over-the-Counter—some 2200 companies on two diskettes.

Information in the service is drawn from the databases and work of analysts at Standard & Poor's Corporation. (*List Price: \$245 each, NYSE and ASE diskettes; \$490, OTC on two diskettes*)

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive
Standard & Poor's Corporation
25 Broadway
New York, NY 10004
(202) 248-3472

CIRCLE 578 ON READER SERVICE CARD

Tax-Prep

Tax-Prep is a personal income-tax-preparation system that is designed for users of the Multiplan interactive electronic spreadsheet. The software package includes 19 income-tax forms and schedules and reflects all of the new 1983 tax laws and IRS regulations.

Through use of template-linkage, a data-entry procedure that interrelates templates for a complete series of tax forms and schedules, the system automatically applies information that you enter to all appropriate forms and schedules.

In addition to standard form 1040 and schedules A, B, C, D, E, G, R, RP, SE, and W, Tax-Prep also includes templates for forms 2106, 2119, 2210, 2440, 2441, 3903, 4684, and 6251.

Tax-Prep prints directly onto IRS 1040 forms and schedules, continuous 1040 forms, and white computer paper

used with an overlay. Tax-Prep also uses all the advanced capabilities of Multiplan to perform such functions as tax planning, budgeting, and analysis. The system comes with a comprehensive user manual and convenient step-by-step tutorial. Annual updating is available. (*List Price: \$89.95*)

Requires: Apple II, II Plus, or IIe; 64K RAM; Multiplan; one disk drive
EZ Ware, Inc.
Bryn Mawr Avenue
Bala Cynwyd, PA 19004
(215) 667-4833

CIRCLE 579 ON READER SERVICE CARD

Homeword

Homeword word-processing software for the home computer uses icons (symbols) to guide users through the program. The icons replace the complex documentation usually associated with utility software.

Homeword users, with the help of a short, clearly written instruction booklet and an audio cassette, can file, edit, design page layouts, and print any form of copy. There is no need to memorize complicated procedures or learn lists of commands. Using the icons as a guide, any member of the family can easily

write and print personal letters, lists of addresses, phone numbers, recipes, monthly budgets, homework assignments, and overtime office work, filing any pertinent information for future reference.

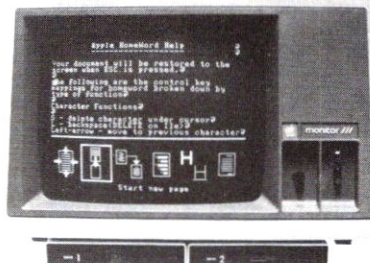
The initial Homeword menu displays six pictures that represent the following options: filing (a file cabinet); editing (a page of print); printing (a printer); format design (an unorganized page with an arrow pointing to an organized page); customizing (a question mark); and disk utilities (a floppy disk). Within each category represented by the original six pictures is another menu offering icons that detail the specific functions of each option.

To recall the functions of other keys on the console, users can refer to a reference card or press the Help key, which reveals the properties of certain keys and offers short cuts. An attractive feature of Homeword is its capacity to divide the screen into three sections: the upper half reveals the working text, the lower-right side provides a replica of the entire page as it will be printed, and the lower-left side pictures a chart that notes the remaining memory and disk space. (*List Price: \$69.95*)

Future programs in the Homeword series will include: Homeword Speller, which contains a wordbook of more than 28,000 commonly used and misspelled words, with the capability of adding 2500 other words of the user's choice (*List Price: \$39.95*); Homeword Double, containing Homeword and Homeword Speller (*List Price: \$99.95*); Homeword Filer, a database program for home use that is integrated with Homeword and Homeword Speller and features the same icon technology and ability to exchange information between the three systems (*List Price: \$69.95*); and Homeword Triple, which contains Homeword, Homeword Speller, and Homeword Filer (*List Price: \$149.95*).

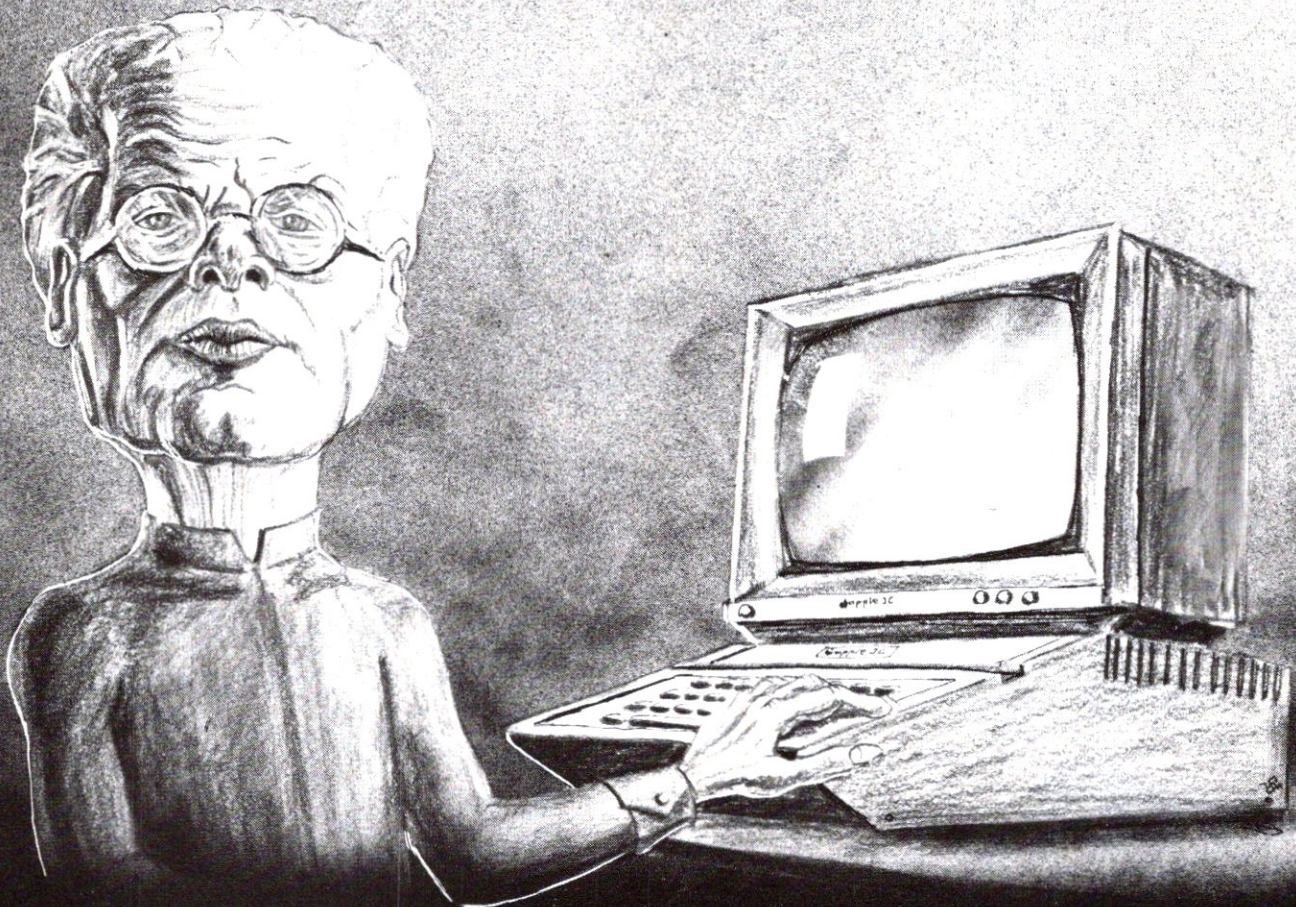
Requires: Apple II, II Plus, or IIe; 64K RAM; one disk drive
Sierra On-Line, Inc.
Sierra On-Line Building
Coarsegold, CA 93614
(209) 683-6858

CIRCLE 580 ON READER SERVICE CARD



Screens from Homeword, Sierra On-Line's new word-processing program for home use

Finally, a 6502 Assembler that doesn't require a genius to operate.



LISA v2.6

You don't need an I.Q. of 200 to learn assembly language on your Apple II or Apple//e. All you need is the best 6502 assembler around: **Lazer's Interactive Symbolic Assembler (LISA v2.6)**. LISA is the easy-to-learn and easy-to-use system that will have even the absolute beginner up and running in a matter of minutes. In addition to LISA's clearly written 240-page manual more tutorial material is available for LISA than any other assembler (including books by D. Fudge, R. Hyde, W. Mauer, and R. Mottola). LISA is the beginner's best choice.

Even if your I.Q. is 200, you'll appreciate LISA's speed, power, and ease of use. At 20,000 lines/minute it's 20 to 30 times faster than ORCA/M or Apple's own Toolkit assembler. That's why people like Bill Budge, Ken Williams, Brian Fitzgerald, Don Fudge, and Steve Wozniak use it every day. LISA is very usable. That's why it's the most often used assembler ever created for the Apple II.

LISA v2.6 is available for \$79.95 at computer stores everywhere. If your local computer store doesn't have a copy you can order directly from:

Lazerware, 925 Lorna St., Corona, California 91720. (714) 735-1041

LAZERWARE

CIRCLE 147 ON READER SERVICE CARD

▶ PRODUCT NEWS

Ramdrive IIe

Ramdrive IIe disk-emulation software works with all 64K and 128K extended 80-column cards. It allows you to use the additional memory on these cards as a RAM disk. The software is compatible with Apple Pascal 1.1, DOS 3.3, 80 columns, and double hi-res graphics. It can run up to 40 times faster than mechanical disk drives when using the supplied public-domain DOS speed-up utility. Ramdrive IIe retains the features of the Ramdisk IIe, including audio-visual access indicators, easy set-up for turnkey operation, menu-drive documentation, and reinitialize-directory ability. (List Price: \$29.95)

Requires: Apple IIe; extended 80-column card (64K or 128K RAM) Precision Software
6514 North Fresno Street
Milwaukee, WI 53224
(414) 353-1666

CIRCLE 581 ON READER SERVICE CARD

Graphics Department

Graphics Department combines all of the most commonly requested graphic functions—plotting, chart generation, a lettering kit, graphics editor, and slide projector—into a single menu-driven system.

Graphics Department's Chart Generator Module converts tabular business data or VisiCalc DIF files into pie, bar, scatter, and line graphs. It automatically scales and labels graph axes.

You can use the Graphics Editor Module to "paint" a picture from scratch, redesign an existing picture, or put finishing touches on a chart. You can use over 20 different character fonts to letter anywhere on a picture. The Graphics Editor also lets you cut and paste, overlay, and merge portions of pictures.

It supports etch-a-sketch, shape table, and paintbrush-style drawing modes.

The Slide Projector Module com-

bines the finished pictures into a professional presentation.

You can use either a game paddle or keyboard to manually select the slides forward and backward, or you can set up a presentation ahead of time to automatically change slides at preset intervals.

(List Price: \$124.95)

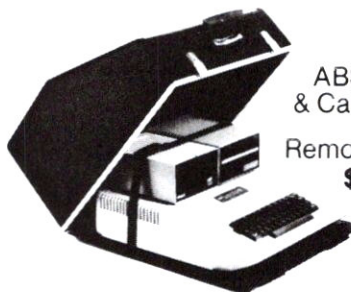
Requires: Apple II, II Plus, or IIe; 48K RAM; Apple DOS; one disk drive
Sensible Software, Inc.
6619 Perham Drive
West Bloomfield, MI 48033
(313) 399-8877

CIRCLE 582 ON READER SERVICE CARD

▶ CORRECTION

Our December 1983 issue carried a Product News item in which Microtek's Dumpling-GX printer interface card was incorrectly priced at \$159. The price is actually \$89.95.

**Travel With Your Apple...
Call (800) 847-4176!**



ABS Storage
& Carrying Case
with
Removable Cover
\$69.50*

*UPS Shipping Included.

Apple • IBM • Epson

Call for Complete Computer Case Catalog.
Credit Card Customers Call Toll Free

Fiberbilt

Ikelheimer-Ernst, Inc.
601 West 26th Street
New York, New York 10001-1199
(212) 675-5820 (N.Y. State)



Gladly accepted

CIRCLE 159 ON READER SERVICE CARD

**LABEL YOUR DISKS WITH...
The Disk Labeller**

MISCELLANEOUS
SEC FREE-296 SEC USED-200 DOS 3.3
SORT FILE PAYROLL ACCOUNT RE
HI-RES GAM SPACE GAME DATABASE
FILESTRUCT CARD GAMES MAILING LI
COPY PROGR ACTION GAM MEMO LIST
DISK CHECK PADDLE GAM CHECKBOOK
DISK# DLO1
EXEC FILE
TEXTWRITER
FORM LETTE
CORRESPOND
MASTER FIL

FEATURES:

- AUTOMATIC LABELLING
- COMPLETELY MENU DRIVEN
- INCLUDES 300 5" LABELS

REQUIRES:

- 64K APPLE II/II+/IIe*
or EQUIVALENTS
- DISK DRIVE •PRINTER

SPECIAL PRICE
\$59.95

SEND CHECK OR MONEY ORDER TO:

PRACTICAL SOFTWARE LTD.

P.O. Box 64 Dept. A Pomona, N.Y. 10970

Phone: 914-425-1158

ADD \$3.00 SHIPPING & HANDLING - N.Y. RESIDENTS PLEASE ADD SALES TAX
*APPLE II/II+/IIe ARE REGISTERED TRADEMARKS OF APPLE COMPUTER, INC.

CIRCLE 146 ON READER SERVICE CARD

RATES AND INFORMATION

Listings are grouped by category and consist of a bold lead line (23 characters maximum), 7 lines of ad copy (45 characters per line), plus 4 lines of company name, address and telephone number.

Listings are published only on a 3 issue basis at \$100. per issue (\$300. total). Additional lines are available @ \$10.00 per line. Copy will have a set format and remain the same for all 3 months. Enhance the appearance of your ad by including your Logo at an additional cost of \$75. per issue (\$225. minimum extra charge). Pre-payment is required by check, money order, or American Express, Diners Club, MasterCard, Visa credit cards. Closing Date 1st of 2nd month preceding cover date.

Send copy and remittance to A+, APPLE DIRECTORY, 12th FLOOR, 1 PARK AVENUE, NEW YORK, NY 10016. Call (212) 725-4215 for additional information or assistance.

▶ **COMPUTER LEASING**

RENT SOFTWARE... OR

Buy it, Sell it, Swap it.

Over 1,000 commercial titles, strictly Apple, for home or business applications. Rent software for three weeks at a fraction of the retail price. All rental fees are applied to our super low prices... if you decide to buy. Call now or write for more info. Visa/MC accepted.

BLACK SUN PROGRAM EXCHANGE
P.O. Box 406
Emmaus, PA 18049
(215) 967-3300

▶ **COMPUTER TRAINING**

KNOW YOUR APPLE IN 4 HRS

Perfect for the new Apple IIe owner—"How to Use Your Apple IIe in 10 Easy Video lessons". This 2½ hour videocassette will take a novice from ignorance to computer literacy in 4 hrs or less. Versions also for Apple II+, and Apple III; all in VHS, Beta 1, Beta 11 and ¾" formats from \$69.50.

Kennen Publishing
a division of Dudkowski-Lynch Assoc., Inc.
150 Shoreline Hwy, Bldg. E
Mill Valley, CA 94941
(800) 428-7777
In California (415) 332-5828.

▶ **DISKETTE COPY SERVICE**

SOFTWARE PACKAGING

ORIGINAL PROGRAM DUPLICATION for all popular systems and formats. Professional organization designs, assembles and distributes packaging materials for software retailing. Operations are performed per client specs and assured by equipment precision and workmanship integrity. Boxes, binders, shrink and rack packs.

I/O Management
63+ Lincoln Street
Worcester, MA 01605
(617) 755-0900; (800) 343-1292

▶ **HARDWARE/ADD-ON BOARDS**

NEW BOARDS FOR APPLE II/IIe

68000 Assembler Development System utilizes MC68008, only 6" in length—\$299 complete. 6809 Assembler Development System-DOS 3.3 Compatible, Macro with Debugger—\$325 complete. VITAMILL SPEED UP system-speed up PFS, State of The Art, and all Apple Pascal programs 200-300%—\$399 complete. All products one year warranty.

STELLATION TWO
Lobero Bldg., PO Box 2342
Santa Barbara, CA 93120
(805) 966-1140

▶ **HARDWARE/DISK DRIVES**

RELIABLE COMPATIBLE DRIVES

Save on MITAC Disk Drives. Mitac's 5¼" 10MB Winchester Disk Drive is the business partner you need. It enlarges your storage capacity & speeds your data inquiry response. For top performance & quality—the AD-100A is only \$1450. Floppy disk sale AD-1 \$185. Just plug in & run. Visa/MC.

OZTECH
1400 Coleman Ave. Suite E25
Santa Clara, CA 95050. (800) 222-6677
In California: (408) 980-9987

▶ **HARDWARE/DISKETTES**

5¼" WABASH DISKETTES

Top Quality—Six year warranty by Wabash. ...SSSD with hub ring \$17.90 (10), \$160.00 (100) ... SSSD with hub ring \$20.50 (10), \$190.00 (100). INDIVIDUALLY CERTIFIED 100% ERROR-FREE. Shipping—\$2. (90 or less) or \$5. per case of 100 diskettes. Illinois residents add 6% tax. VISA, Master Card, Money Order, Check. COD add \$3. DIGITAL IMAGES
1133 Tower Rd.
Schaumburg, IL 60195
(800) 222-1248
(312) 882-8315

3M SCOTCH DISKS \$20.50

SS/DD 5.25" \$2.50 DS/DD 5.25" \$25.50. Generics SS/DD \$27.98 DS/DD \$39.98/20. Super-calc base 2 \$125 less \$15 rebate. Ribbons-C. Itoh/NEC 8023 \$4.29 Epson MX70/80 \$3.85. Flip file storage 75 capacity \$15.75 File Box 10 capacity \$1.49. Labels \$12.50/5M. Satisfaction guaranteed since 1977. CA RES. ADD 6.5%. ARGONAUT DISTRIBUTING
1104 Buchanan Rd At
Antioch, CA 94509
(415) 778-2595

▶ **HARDWARE/MONITORS**

RGB COLOR BOARD

FOR APPLE IIe, II+, Franklin Ace 1000. Color Master Model VCB8, a new video board that provides RGB video signals for crisp, vivid display of color graphics & text with greatly enhanced resolution & color quality. Plugs in to slot 7 & can be used with Apple's 80 column board with extra memory. Text can be displayed in any one of 8 colors, software selectable. \$139.
TELEMAX, INC.
Box 339
Warrington, PA 18976
215-343-3000

▶ **HARDWARE/PERIPHERALS**

MODEM SYSTEM FOR APPLE II

The "MULTI-MODEM IIe" from Multi-Tech Systems provides Apple II, II+ and IIe users with 300 bps dial-up communications. Modem is single pc card that plugs into Apple expansion slot. Includes complete software on diskette. DOS, CP/M, Hayes compatible. Autodial, auto-answ, logon, menu, file transfer, number directory.

MULTI-TECH SYSTEMS

MULTI-TECH SYSTEMS INC.
82 Second Avenue S.E.
New Brighton, Minnesota 55112
(612) 631-3550 * TWX (910) 563-3610

▶ **HARDWARE/POWER PROTECTION**

COMPUTER PROTECTION

Spike protection: Com-protect I Spike Protector \$39.95. Com-protect II Spike & RFI Filter \$59.95 w/6 ft. cord. Com-protect III Spike, Failsafe surge protection and RFI Filter w/6 ft. cord \$89.95. All units have 6 each 3 wire grounded outlets, 600 amp @ 8x10 usec suppressor. RFI filtering from 96Khz to 41mhz. From:
COM-PROTECT, INC.
Rt. 4 Box 427X
Slidell, LA 70458
(504) 641-1316

▶ **HARDWARE/STORAGE DEVICES**

64K RAM ADAPTER

Quadruple your memory! Adapter allows the use of 64K RAM's in place of 16K RAM's in the Apple II and Ace computers. Includes software to utilize the additional 144K of RAM afforded for DOS 3.3, Pascal, and CP/M disk emulation, multiprogramming, etc. Call or write for additional information.
CRAMAPPLE ADAPTER
85 Bartlett Street
Somerville, MA 02145
(617) 628-0206

► PUBLICATIONS

MINUTE MANUALS

Apple Writer IIe \$7.95
 DB Master 12.95
 Apple Writer II+ 7.95
 Provides easy step-by-step instructions for the basic operating procedures that get you working at the highest possible skill level in the shortest amount of time. Free info.
MINUTE WARE
 P.O. BOX 2392
 COLUMBIA, MD 21045
 (301) 995-1166

PC BUYERS GUIDE

THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an Index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only \$7.95 (+ \$1.00 shipping/handling) to U.S. destinations; and \$10.00 (+ \$3.00 s/h), elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, NY, and VT, add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
 P.O. Box 555
 Morris Plains, NJ 07950

► RETAILERS/ NEW YORK

A WORLD OF COMPUTERS A WORLD OF DIFFERENCE

SPECIAL OFFER \$150 Kensington system saver plus format II word processor. Special prices on all Apple peripherals. Call or write:
A WORLD OF COMPUTERS
 519 Boston Post Road
 Port Chester, NY 10573
 (914) 937-6845

► SOFTWARE COMMUNICATIONS

BULLETIN BOARD SOFTWARE

"A.B.B.S. 4 DOT 2" is a high powered BBS for the Apple II, II+, IIe. It handles both 1200 and 300 baud callers. Its modular design lets you tailor your BBs to your needs. Master Card/Visa accepted. For complete details send SASE TO:
SOFTWARE SORCERY
 7927 Jones Branch Drive, Suite 400
 Mclean, VA 22102
 (703) 471-0572,
 (703) 471-0610 (A.B.B.S. number)

► SOFTWARE/DATA MANAGEMENT

PROFILER DATABASE MANAGER

Featuring ProDOS, Apple's new operating system. The first truly easy database manager. Store more than 1500 records per disk (up to 65,000 records on hard disk). Indexed files for instant record access. Editor & report generator included in one package. \$49.95. Dealer inquiries invited.
CUSTOM COMPUTER PRODUCTS
 355 Costa Mesa St., #A
 Costa Mesa, CA 92627
 (714) 548-5429

PROCESS MORE ORDERS!

That's what you'll be doing when your ad appears in Apple Directory each month. Apple Directory provides easy reference to services/hardware/software. You can be part of it for 3 months for only \$300.00. You get 7 lines of copy PLUS a boldface heading PLUS 4 lines for your name, address, phone number. Logo art may be used for \$225.00 additional for 3 months. Extra copy lines are \$10.00 line/issue.
APPLE DIRECTORY
 1 Park Avenue
 New York, NY 10016
 Lois Price: (212) 725-4215

► SOFTWARE/ DEVELOPMENT TOOLS

I.R.A.M.™

INDEXED Random Access Method gives the Applesoft user B-TREE file access to data files. Retrieval by key can be done either in Random or sequential mode from any point in the file. Specify DOS 3.3 or ProDOS™ version. Introductory offer with a listable demo is \$31.95 ppd. (within USA).
 The Komputer Kitchen
 Post Office Box 267-Dept AP44
 New Haven, CT 06502-0267
 (203) 932-4410.

► SOFTWARE/ EDUCATIONAL

MULTI-LINGUAL SOFTWARE

French and Multi-Lingual Software for the Apple II+ or IIe. Free Catalogue. Newest release-Multi Lingual Questionnaire Generator; THE GREAT CREATOR can be used in 17 different languages to create & operate multiple-choice and fill in the blank questionnaires. No EXTRA HARDWARE REQUIRED. Demo available for \$5.00.
THE PROFESSOR
 P.O. Box 301B
 Swanton, VT 05488
 (514) 747-9130

THE MEDALISTS

SIX CHALLENGING GAMES which will encourage you and your children to learn about our geography and history. The set includes: States, Continents and Oceans, Presidents, Women in History, and Black Americans. Clues may be changed continuously. Price: \$39.95 ea. Send for our FREE catalogue of 55 educational programs.
HARTLEY COURSEWARE INC.
 P.O. Box 419
 Dimondale, MI 48821
 (517) 646-6458

THE BEST LEARNING PROGRAMS

The Best Learning Programs—far less! Catalog of top-rated educational software from leading publishers at lowest prices anywhere. Satisfaction guaranteed or your money back.
K-12 MicroMedia
 172 Broadway, Dept. AD
 Woodcliff Lake, NJ 07675
 (201) 391-7555

► SOFTWARE/ FINANCIAL

AMORTIZATION PACKAGE

AM*PACK is designed for home owners, small businesses and prospective borrowers. Ideal for predicting periodic payments, principal and interest, and original loan value based on different interest rates, down payments etc. Flexible, easy to use, professional 80 column printouts. For Apple II, II+, IIe. Send, \$24.95 check or money order to:
SOFT FLAIR
 2100 W. 53rd
 Minneapolis, MN 55419
 Shipping and handling included.

► SOFTWARE/ GAMES

APPLE GAME DISK EXCHANGE

Adventure games are great until solved. Arcade games can get stale. Now exchange your unwanted games for ones you would like to play. Write for information or send your original manufacturer's disk, documentation, a list of five games for us to choose your exchange from and \$5.50 to:
NATIONAL HOME COMPUTER GAME EXCHANGE
 P.O. Box 20285
 Columbus, OH 43220

► SOFTWARE/ GAMES— EDUCATIONAL

RENT SOFTWARE FOR APPLE

WE RENT and sell a large selection of game, educational and utility programs. Club Membership costs only \$50 (Renewal \$15/yr). Rental Period of 90 Days. Most Game Rentals Only \$4. No Deposits Required as long as Rentals Don't Exceed \$8. For Full Details Send \$1 to:
DELSON'S PHOTO, SOFTWARE DEPT. A
 19801 Vanowen St.
 Canoga Park, CA 91306
 (818) 887-5260

► SOFTWARE: GENERAL

GENEALOGY/FAMILY ROOTS

Family roots for your genealogy. Store standard and custom info.—does group and individual sheets, four types of charts, various indices, general searches, and much more. No limits. Very comprehensive. Satisfaction guaranteed. Price \$188.50 including postage.
QUINSEPT, Inc.
 P.O. Box 216
 Lexington, MA 02173
 (617) 862-0404

WORK FORCE II

6 ultra-friendly programs for all Apple II's. Loan amortization, Future value of savings, 4 function printing calculator with memory & %, check book balancing, wage analyzer, and a Line-at-a-time correctable typewriter. Req. DOS 3.3 & 48K, printer optional. Copyable. Includes manual & shipping. Only \$29.95! Checks & American Express card accepted.
CORE CONCEPTS
 P.O. Box 24157
 Tempe, AZ 85282
 (602) 968-3756

MONTE CARLO SIMULATIONS

Statistical analysis plus much more. This general purpose decision-making tool features a non-technical approach, detailed reports. Goodness of Fit Test, VisiCalc compatibility, and dynamic hi-res graphics and audio enhancement. Requires 48K Apple II, II+, IIe etc.) and one drive (DOS 3.3). \$60. (\$90 w/source code).
ACTUARIAL MICRO SOFTWARE
 3915 A Valley Court
 Winston Salem, NC 27106
 (919) 765-5588

► SOFTWARE/ GRAPHICS

16-SCREEN DRAWING AREA

Charts unlimited provides machine language speed and 16-screen drawing area for creating flowcharts, floor plans, organizational charts, and more for only \$195 on your 64K Apple II+/Ile. Mix 3 kinds of text with the predefined objects and symbols. Replicate, enlarge, shrink, or rearrange objects in only seconds.

GRAPHWARE, INC.
5084 Mosiman Road
Middletown, OH 45042
(513) 424-6733

SOFTWARE AUTHORS

Add 26 new Hi-res commands to Applesoft basic through a Graphic Ampersand language. Provide for proportional text, bit-mapped animation, scrolling and many other graphic routines in your programs. Get GRAPHICMASTER. Uses 48K Apple II+/Ile and disk drive. \$79.95 plus \$2.00 postage. (CA residents add 6% sales tax).

TID BIT SOFTWARE
P.O. Box 5579
Santa Barbara, CA 93108
(805) 969-5834

UTILIZE THIS SPACE!

Consult Apple Directory every month for easy reference to services/hardware/software. You can be part of Apple Directory for 3 months for only \$300.00. You get 7 lines of copy PLUS a boldface heading PLUS 4 lines for your name, address and phone number. Logo art \$75 per issue additional.

APPLE DIRECTORY
1 Park Avenue
New York, NY 10016
Lois Price: (212) 725-4215

► SOFTWARE/ HOBBIES

BOWL-KEEPER

This program maintains all scores and calculates weekly average, accumulated average, weekly series, total pins, handicap, high game, and high series. Written in Applesoft and is unprotected. Requires 48K Apple II+/Ile and disk drive. Printer recommended. \$29.95 plus \$2.00 postage. (FLA residents add 5% sales tax).

SOFTWARE UNLIMITED
P.O. Box 6361
Clearwater, FL 33518
(813) 797-7815

ASTROLOGY SOFTWARE

We have everything from the under-\$50 ASTROSCOPE™ and SEX-O-SCOPE™ which read the Horoscope as well as cast it, on up to high-accuracy calculation packages for professional astrologers. Our printing text programs, including PERSONAL NUMBEROLOGY™ come with a license to sell the printed output.

AGS SOFTWARE
P.O. Box 28, Dept. B
Orleans, MA 02653
(617) 255-0510

ATTENTION: COIN COLLECTORS

Unique program records entire collection and produces various reports that serve for personal investment information. Built-in market value provides latest prices for 1600 U.S. coins. Requires 48K/1 drive/printer. **Coins** software & manual \$95 (Manual only-\$10). VISA/MC OK. QUARTERLY **Coins** value updates \$25.

COMPU-QUOTE
6914 Berquist Ave. Dept. AZ.
Canoga Park, CA 91307
(818) 348-3662

► SOFTWARE/ LANGUAGES

FORTH SOFTWARE PACKAGES

Forth is a structured high level language best known for its speed and interactive compiling capabilities. Our forth packages include a screens disk containing: a full screen editor, 6502 assembler, decompiler, arrays and many other examples. Fig-forth package price \$40.00. Forth-79 price \$60.00.

ON-GOING IDEAS
Rd. #1, Box 810
Starksboro, VT 05487
(802) 453-4442

UTILITIES BY THUNDER

Thunder C Compiler—native code compiler for speed, macro-pre processor and more. Take complete control of your Apple with Thunder C! Ap. Pascal 1.1 req. \$49.95. AS-SYST; the Assembler system—your 6502 development system. Easy to use EDITOR, ASSEMBLER and LISTER. A fantastic buy for beginner to intermediate! \$23.50 (+ \$3.00 p/h ea).

THUNDER SOFTWARE
POB 31501
Houston, TX 77231
(713) 728-5501

KITCHEN PLANNER

Create a 1-14 day Menu and Shopping List in less than 5 min. The only program available which both composes balanced meals and lets you change them! It's also the fastest and easiest to use. Compact, useable printout. To order send \$29.95 + \$1.50 (handling) or call with VISA/MC. All Apple II's. CA add 6½%.

SAV-SOFT PRODUCTS
P.O. Box 24898
San Jose, Calif. 95154
(408) 978-1048

► SOFTWARE/ PERSONAL

COMPUTER ROAD ATLAS

Enter departing city and destination city. Roadsearch-plus computes and prints the best route with miles, time and fuel. Add up to 50 USA/Canada cities to the original 406. DOS 3.3 unlocked. 15 day money back guarantee. \$74.95, \$34.95 with non-expandable data-based. Add \$1.50 S/H. Check/Visa/MC at our dealer or:

COLUMBIA SOFTWARE
Box 2235Y
Columbia, MD 21045
(301) 997-3100

► SOFTWARE/ UTILITIES

XPS—DIAGNOSTIC PROGRAM

Easy to use menu driven diagnostic utility for the Apple II, Apple II+, and Apple Ile computer systems. Checks RAMS, ROMS, disks, keyboard, peripherals, printers, 80-column cards (Ile only), monitor, and more. Comes with back-up disk and manual. Requires 48K and one disk drive. Specify computer, \$49.95.

XPS Inc.
P.O. Box 140
Carlisle, PA 17013
(717) 243-5373

ESSENTIAL DATA DUPLICATOR

The newest and most powerful duplicator for Apple software. It is easier to use and backs up more of the newer software much more reliably than any other nibble or hardware backup on the market today. \$79.95 plus \$2.00 S/H (US), (\$5.00 Foreign). VISA, Master Card accepted. See our display at this issue:

UTILICO SOFTWARE
3377 Solano Ave., Suite 352
Napa, CA 94558
(707) 257-2420

THE DISK LABELLER

A powerful program for automatic printing of diskette labels showing FILES, DOS-sec free & used. Built-in default & escape functions, auto config. for printer slots & drives. Completely MENU driven. Req. no doc. Includes 300 5 inch labels. Req. 64K Apple II, II+, Ile disk dr., printer. Only \$59.95 + \$3 ship. NY res. add sales tax. See our display ad in March.

PRACTICAL SOFTWARE LIMITED
Dept AC, Box 64
Pomona, NY 10970
(914) 425-1158

► SOFTWARE/WORD PROCESSING

CIRCASCRIPT ONLY \$39.95

Over 50 features make the CircaScript word processor for the II+ and Ile as powerful as ones selling for 3X more. Support the Ile 80 column card and keyboard. Now! CircaScript Plus (\$59.95) with all the features of CircaScript, plus mail merge capability and 5 different file conversion programs. VISA/MC.

Circadian Software
575 Wickham Road, Ste. I
Melbourne, FL 32901
(305) 676-5822

GET SMART!

Consult Apple Directory every month for easy reference to services/hardware/software. You can be part of Apple Directory for 3 months for only \$300.00. You get 7 lines of copy PLUS a boldface heading PLUS 4 lines for your name, address and phone number. Logo art \$75. per issue additional.

APPLE DIRECTORY
1 Park Avenue
New York, NY 10016
Lois Price: (212) 725-4215

"TELEDELIVERY" ?

- SOFTWARE ON DEMAND
- FASTEST DELIVERY ANYWHERE
- 24-HOUR ACCESS, WORLDWIDE
- SAVE TIME, TRAVEL, MONEY
- EXCELLENT CUSTOMER SUPPORT

TRY IT NOW!

CALL, VIA MODEM: (213) 516-9432
AND EXPERIENCE THE FUTURE.



BIG SAVINGS FOR APPLE OWNERS

Z 80CARD	\$80
80 COLUMN CARD	\$90
128 K RAM DISK	\$225
GREEN MONITORS	from \$89
AMBER MONITORS	from \$120
COLOR MONITORS	from \$295
PRINTERS	from \$220
DISK DRIVES	from \$199

MORE!

For free price list or to order
call or write:

THRIFTY BITS

2722 Windy Bush Rd.
New Town, Pa. 18940
(215) 598-8119

HELLO ADVENTURER

Do you have an adventure that you haven't been able to solve? Witt's Notes are the answer! Witt's Notes are comprehensive booklets of hints and maps for most adventures. Games like: **Zork (I, II or III)**, **Starcross**, **Deadline**, **Suspended**, **Witness**, **Enchanter**, **Planetfall**, **Infidel**, **Colossal Cave**, **Quest**, **Transylvania**, **Coveted Mirror**, **Mask of Sun**, **Serpent's Star**, **Death in Caribbean**, **Blackpoole**, **Kabul Spy**, **Mystery House**, **Wizard**, **Cranston**, **Ulysses**, **Time Zone**, **Dark Crystal** and many more. Best of all, each is only \$5.95. Quantity discounts available. Write for our free catalog which lists other products including software, posters and more! Dealer inquiries invited. CT residents add 7 1/2% sales tax.



WITT'S END
42 Morehouse Rd
Easton, CT 06612

PROGRAM YOURSELF FOR SUCCESS THROUGH SUBLIMINAL SUGGESTION

View the ever-changing pattern that appears on the screen as suggestions for self-improvement flash at a rate that cannot be consciously comprehended but that allows for subconscious absorption and affects behavior. Each program comes with a list of the suggestions used. Let your computer program you to:

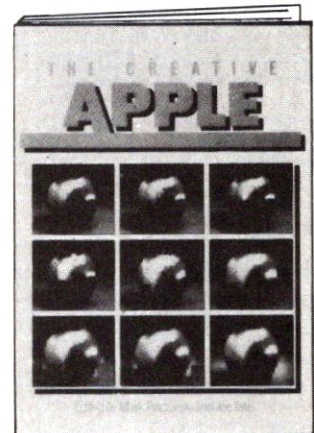
\$32.00 EACH	QTY	SUBTOTAL
THINK POSITIVELY		
BE RICH AND WEALTHY		
BE HAPPY		
BE SUCCESSFUL		
SOLVE PROBLEMS		
STOP DRINKING ALCOHOL		
QUIT SMOKING		
LOSE WEIGHT		
LIMIT ALCOHOL CONSUMPTION		
ENJOY MUTUALLY SATISFYING SEX		
TOTAL		

Each program is Apple II, II+, and IIe compatible. \$32. and copy-protected. Send check or money order to:
INNER SCIENCE SOFTWARE, INC.
2423 High Street • Des Moines, IA 50312

Name _____
Address _____
City _____ State _____ Zip _____

ATTENTION APPLE® FREAKS!

Here's the book
you've been looking for!



THE CREATIVE APPLE

The Creative Apple brings you the best articles and features on the Apple to appear in the past four years of *Creative Computing*. Revised and updated, this wealth of material gives you dozens of ways to tap the tremendous potential of your Apple, improve your programming skills, and expand your computing knowledge. Graphic utilities, animation, digitized images, music editing, educational software and applications, telecomputing, home control systems, VisiCalc and many other timely topics are thoroughly examined and discussed. Ready-to-run programs give you immediate use of this informative and stimulating collection, while a chapter on tips and tricks for easier programming lets you unlock the versatility of the Apple computer—and your own resourcefulness.

Whether for business, personal budgeting, the thrill of computer games or the development of educational applications, you'll find plenty here to help you get the most out of your Apple.

The Creative Apple, edited by Mark Pelczarski and Joe Tate. 8 1/2 x 11", softcover, illustrated. \$16.95

Apple is a registered trademark of Apple Computer, Inc.

CREATIVE COMPUTING PRESS Dept. NO1C
39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of *Creative Apple* at \$16.95 each* plus \$2 postage and handling. #18R.

Outside USA add \$3 postage and handling charge.

*CA, NJ and NY State residents add applicable sales tax.

PAYMENT ENCLOSED \$ _____

CHARGE MY:
 American Express MasterCard Visa

Card No. _____ Exp. Date. _____

Signature _____

Mr /Mrs /Ms. _____ (please print full name)

Address _____ Apt. _____

City _____

State _____ Zip _____

For faster service, **PHONE TOLL FREE: 800-631-8112**

(In NJ call 201-540-0445)

Super Savings Apple Compatible Equipment

- 1/2 High Drives \$175.00
- Controller Card 44.00
- Heavy Duty Joy Stick 24.95
- Cooling Fan 38.00
- 80 Column Card 119.95
- Monitor - Amber 119.00
- Taxan 210 Color 299.00
- 16K Ram Card 39.95
- Ram Chips 16K 2.00 ea.
- Monitor Stand 12.95

THE LAST ENTRY

414 N. STATE COLLEGE BLVD.
#C182 - ANAHEIM, CA 92806

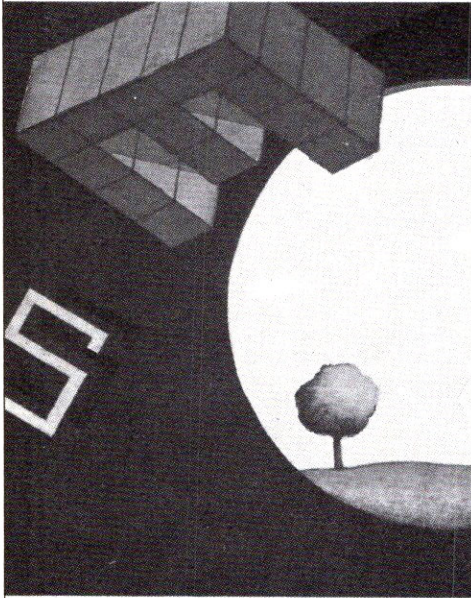
714-978-9833

FREE CATALOG!

Just let us know and we'll mail you a FREE *Creative Computing* Catalog—16 pages filled with books, buyer's guides, magazines, and more!

To get your FREE catalog, write to: *Creative Computing* Catalog, Dept. NA9X, 39 East Hanover Ave., Morris Plains, NJ 07950.

COMING UP



Microsoft BASIC
for the Macintosh
Chart of Macintosh
Software Products
The New Lisas

Apple II Plus Repair Guide,
Part I

Three Telecommunications
Services for Businesspeople

High-Level DBMSs
Four Ways to Do Mail Lists

Large Database
Management

Reviews:
Magic Window II
Keyport 717
N-Squared Market Analyzer
Three Home Word-
Processing Programs

Pascal in Higher Education

Programming:
Modula II

dBase II, Part VIII

INDEX TO ADVERTISERS

READER SERVICE NO.	ADVERTISERS	PAGE	READER SERVICE NO.	ADVERTISERS	PAGE
250	Advanced Computer Products	152	114	Micro Pro	76
108	Advanced Ideas	4	380	Micro Program Designs	151
	ALF Products	106	320	Microsoft	82-83
203	Almaly Trading Corp.	157	319	Microsoft	6-7
107	Amdek Corporation	8	237	Midwest Software Associates	177
	Apple Computer	18-19	125	Nonagon Software	22
	Apple Computer	61	330	Northeastern Software	179
315	Applied Analytics	163	115	Pace Systems	30
	Applied Engineering	24, 108	333	Personal Computer Products	110
266	Applied Technology Labs	73	117	Pictronics	28
267	Arktronics	10	278	Practical Software	186
109	ARTSCI	78	103	Precision Software	51
269	Bach Company	70	104	Prentice Hall	127
	Beck Manufacturing	39	122	Prometheus Products	Cover 3
162	Bible Research	23	127	Protecto Enterprises	16
225	Brady Company	62	152	Quality Engineering	132
450	Burke & Associates	107	118	Quentin Research	121
110	Business Computers of Peterborough	77	120	Quentin Research	111
305	The Byte General	156	241	Quoram International Unltd.	151
116	Bytes and Pieces	31	197	Rising Sun Soft	128
167	Central Valley	130	123	SJB Distributors	111
165	Charles Mann	162	126	SJB Distributors	148
310	Compuserve	54	128	Scharf Systems	12
290	Computer Discount Products	183	403	Sensible Software	134
129	Conroy-LaPointe	27	360	Sinequanon	147
111	CPU	18	246	S. California Research	181
157	Dark Star Systems	175	261	Softinson Data Corp.	131
263	Data Link	157	163	Softronics	122
112	Datamac	118	101	Softstyle	138
385	David Data	126	130	Software Publishing Corp.	13
124	Decision Economics	147	198	Southern California Micro	72
102	Dennison Computer Supplies	Cover 4	171	Spectrum	192
105	Digital Research	32-33	238	Spies Laboratories	124
317	Discwasher	26	365	Strictly Software	124
169	Eastside Software	169	282	Such A Deal	150
173	Enhancement Technology Corp.	1	219	Sun Data, Inc.	26
159	Fiberbilt	186	139	Synetix Systems	5
212	Formula International	166	283	Texprint	158
265	Garden of Eden	164	106	Thoughtware, Inc.	74-75
271	Hayes Products	57	289	Three M	141
	H&E Computronics	Cover 2	178	Titan Tech/Saturn Systems	66
274	Interactive Structures	52	255	Track House	149
276	Jameco	109	366	Trutec Software	137
132	Kensington Microware	117	295	United Software	142
147	Lazerware	185	190	Utilico Software	25
	Living Videotext	12	141	Videx	136
143	Longwood Computing	119	296	Virtual Combinatics	120
168	Mega Byte	162	135	Vufax	149
133	Micro Design	139	364	Wesper Microsystems	68
150	Micro Lab, Inc.	31	131	Woodinville Computer Center	173
			350	Xerox Education Publication	71

Apple
II

CP/M

IBM
PC

SPECTRUM

Professional Software Products

MATHEMATICS SERIES

The Series Includes These 4 Programs:

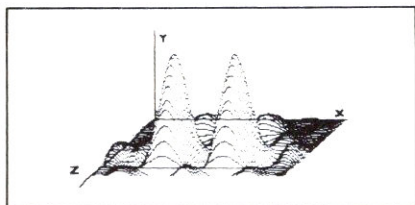
STATISTICAL ANALYSIS I: This menu driven program performs LINEAR REGRESSION analysis, determines the mean, standard deviation and plots the frequency distribution of user-supplied data sets.

NUMERICAL ANALYSIS: HI-RES 2-Dimensional plot of any function. Automatic scaling. At your option, the program will plot the function, plot the INTEGRAL, plot the DERIVATIVE, determine the ROOTS, MAXIMA, MINIMA and INTEGRAL VALUE.

MATRIX: A general purpose, menu driven program for determining the INVERSE and DETERMINANT of any matrix, as well as the SOLUTION to any set of SIMULTANEOUS LINEAR EQUATIONS.

3-D SURFACE PLOTTER: Explore the ELEGANCE and BEAUTY of MATHEMATICS by creating HI-RES PLOTS of 3-dimensional surfaces from any 3-variable equations. Hidden line or transparent plotting.

For APPLE II (48K) and IBM PC (64K) \$50.00



BUSINESS SOFTWARE SERIES

Both Programs \$250.00

A user-friendly yet comprehensive double-entry accounting system employing screen-oriented data input forms, extensive error-trapping, data validation and special routines for high speed operation. The series includes these two modules:

GENERAL LEDGER: A complete accounting system with these features:

- Up to 500 accounts and 500 transactions per month.
- Interactive on-screen transaction journal.
- Produces these reports:

Transactions Journal	Balance Sheet
Account Ledgers	Account Listings
Income Statement	

For APPLE II and IBM PC \$150.00

ACCOUNTS RECEIVABLE

A flexible system with these features

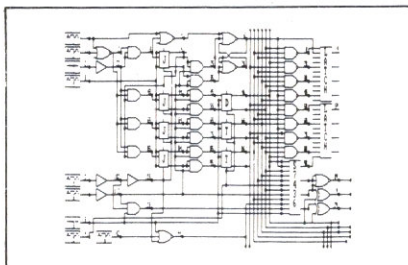
- Up to 500 accounts and up to 500 invoices per diskette.
- Prints invoices, customer statements & address labels.
- Interfaces to General Ledger.
- Interactive screen-based invoice work sheet.
- Produces these reports

Aged Receivables
Sales Analysis
Account Listings
Customer Balances

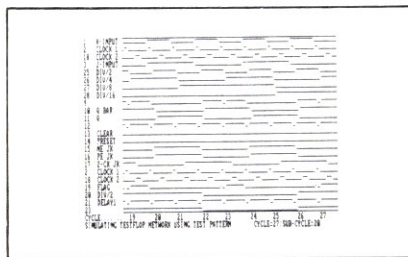
For APPLE II and IBM PC (2 DRIVES) .. \$150.00

MICRO-LOGIC

An interactive graphics program for designing and simulating digital logic systems. Using the built-in graphics module, the user creates a logic diagram consisting of AND, OR, NAND, NOR, EX-OR, D, T, JK FLIP FLOP and powerful 16 pin user-defined MACRO functions. A typical page of a logic diagram looks like this:



The system provides on-screen editors for NETWORKS/MACROS DATA CHANNELS, CLOCK WAVEFORMS and GATES. GATE attributes include DELAY, TRUTH TABLE, NAME and I/O clocking.



The system is available for Apple II and IBM PC computers. A non-graphics version is available for CP/M 2.2 It uses the network editor to create netlists and text printer plots to display simulation results. All versions require 2- 5 1/4" disk drives.

For APPLE II, IBM PC (192K) and CP/M (70K) \$450.00
MANUAL & DEMO DISKETTE \$50.00

PERSONAL FINANCE MASTER

The premier personal and small business financial system. Covering all types of accounts including check registers, savings, money market, loan, credit card and other asset or liability accounts, the system has these features:

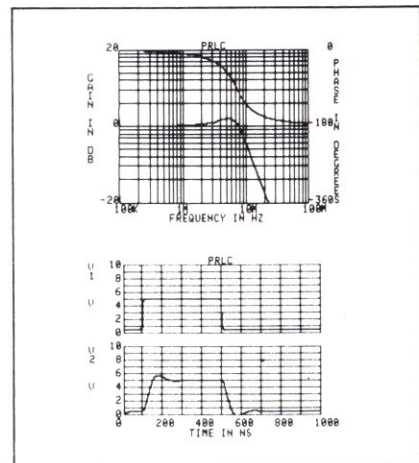
- Handles 25 Asset/Liability Accounts
- Monthly Transaction Reports
- Budgets Income & Expense
- Reconciles to Bank Statements
- Prints Checks & Mailing Labels
- Automatic Year-End Rollover
- Prepares a Net Worth Reports
- Searches for Transactions
- Handles Split Transactions
- User-Friendly Data Entry Forms
- Fast Machine Language Routines
- Extensive Error Trapping
- HI-RES Expense/Income Plots

For APPLE II and IBM PC \$75.00

MICRO-CAP

Microcomputer Circuit Analysis Program

Tired of trial & error circuit design? Analyze and debug your designs before you build them. With MICRO-CAP you simply sketch your circuit diagram on the CRT screen and run an AC, DC or TRANSIENT ANALYSIS. Your circuit may consist of RESISTORS, CAPACITORS, INDUCTORS, DIODES, BATTERIES, BIPOLAR or MOS TRANSISTORS, OPAMPS TRANSFORMERS, and SINSUSOIDAL or USER-DEFINED TIME DEPENDENT VOLTAGE SOURCES. MICRO-CAP can analyze any such network containing up to 40 separate nodes. Includes a user controlled MACRO library for modelling complex components such as OPAMPS and Transistors.



For APPLE II and IBM PC computers. A non-graphics version using an on-screen editor to enter networks and text printer plots to display simulation results is available for CP/M (2.2- 5 1/4" SSSD) systems. Requires 2 disk drives.

For APPLE II, IBM PC (192K) and CP/M (70K) \$475.00
MANUAL and DEMO DISKETTE \$50.00

ORDERING INSTRUCTIONS: All programs are supplied on disk and run on Apple II (64K) or IBM PC (128K) with a single disk drive unless otherwise noted. Detailed instructions included. Orders are shipped within 5 days. Card users include card number. Add \$2.50 postage and handling with each order. California residents add 6 1/2% sales tax. Foreign orders add \$5.00 postage and handling per product.

SPECTRUM SOFTWARE
690 W. Fremont Ave., Suite F
Sunnyvale, CA 94087



FOR PHONE ORDERS:
(408) 738-4387
DEALER INQUIRIES INVITED.



THE INDEPENDENT GUIDE FOR apple COMPUTING

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

Table with 3 columns: Computer Model, Own, Plan to Buy. Rows include Apple II, Apple IIe, Apple III, Lisa, Other (specify), and None.

2 For what, if any, business application(s) do you use the microcomputer you currently own?

Blank lines for writing business application(s).

Grid of numbers 101-800 for marking ownership and purchase plans.

PLEASE PRINT CLEARLY—Use only one card per person.

Form fields for NAME, PHONE NO., COMPANY, TITLE, ADDRESS, APT., CITY, STATE, ZIP.

4 [] Please send me 12 issues of A+ for \$19.97 and bill me. (Full 1 year subscription price \$24.97.)



THE INDEPENDENT GUIDE FOR apple COMPUTING

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

Table with 3 columns: Computer Model, Own, Plan to Buy. Rows include Apple II, Apple IIe, Apple III, Lisa, Other (specify), and None.

2 For what, if any, business application(s) do you use the microcomputer you currently own?

Blank lines for writing business application(s).

Grid of numbers 101-800 for marking ownership and purchase plans.

PLEASE PRINT CLEARLY—Use only one card per person.

Form fields for NAME, PHONE NO., COMPANY, TITLE, ADDRESS, APT., CITY, STATE, ZIP.

4 [] Please send me 12 issues of A+ for \$19.97 and bill me. (Full 1 year subscription price \$24.97.)



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

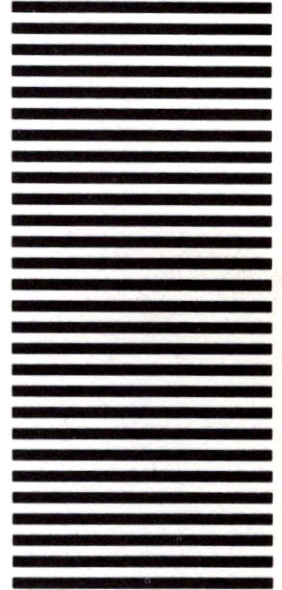
BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346, PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. Box 7715
Philadelphia, PA 19101



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346, PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. Box 7715
Philadelphia, PA 19101



PRO-MODEM 1200



It's about time.

Time for your computer to make the telephone connection – with an intelligent, full 212A 300/1200 baud modem – with a real time clock/calendar – and with the capability to expand into a complete telecommunications system. It's time for PRO-MODEM 1200. Much more than just a phone modem.

When you're on-line, time is money. PRO-MODEM telecommunication systems help you save. By monitoring the duration and cost of your phone calls. And by sending and receiving messages, unattended, at preset times when the rates are lower. . . with or without your computer.

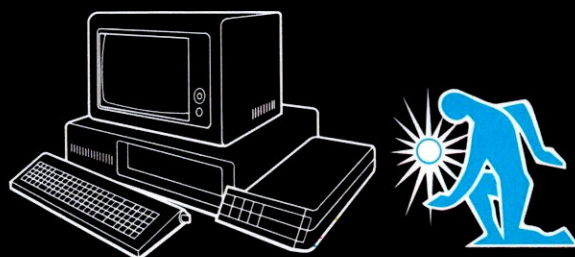
Compare the \$495 PRO-MODEM 1200 with any other modem on the market. For example, you'd have to buy both the Hayes Smartmodem 1200 plus their Chronograph for about \$950 to get a modem with time base.

PRO-MODEM 1200 is easy to use. A convenient "Help" command displays the Menu of operating command choices for quick reference whenever there's a question about what to do next. Extensive internal and remote self-diagnostics assure that the system is operating properly. Some of the other standard features include Auto Answer, Touch Tone and Pulse Dialing, and Programmable Intelligent Dialing.

PRO-MODEM does more. It lets you build a full telecommunications system with features like Auto Dialer, Incoming and Outgoing Message Buffering, Business/Personal Phone Directory, Programmable Operating Instructions, a 12-Character Alpha-Numeric Time and Message Display, and versatile PRO-COM Software. PRO-MODEM commands are Hayes compatible so you can use most existing telecommunications software without modification.

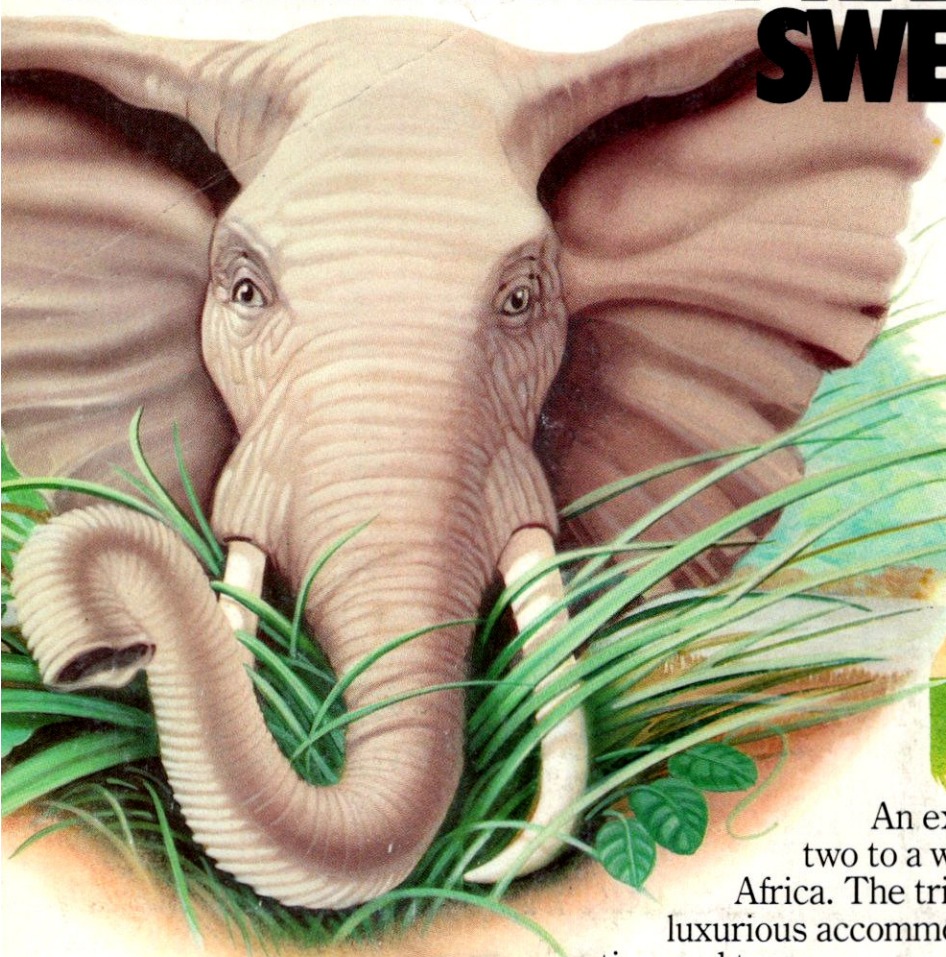
There's much more to the PRO-MODEM story. See your local dealer for complete details. He'll show you how to save time. And money.

Prometheus Products, Inc., 45277 Fremont Blvd., Fremont CA 94538, (415) 490-2370



PROMETHEUS

ENTER THE ELEPHANT™ SAFARI SWEEPSTAKES.



GRAND PRIZE

(1 winner)



An exciting two week adventure for two to a wild game preserve in Kenya, Africa. The trip includes airfare, luxurious accommodations, meals, tips, and taxes.



SECOND PRIZE

(25 winners)

A Bell & Howell 35mm camera. The 35J

complete with fine Lumina lens completely eliminates complicated focusing.

FIRST PRIZE

(5 winners)

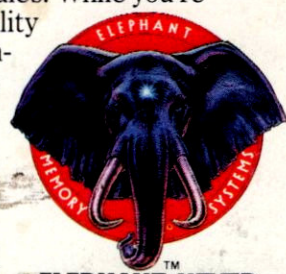
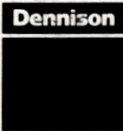
A Deluxe Camping Package featuring an 8' x 10' Wenzel Cabin Tent, four Wenzel sleeping bags, plus a Coleman lantern, stove and cooler.



HOW TO ENTER

No purchase necessary. Just come into a participating Elephant Safari Sweepstakes dealership where you'll find free entry blanks and official rules. While you're there, check out our full line of quality Elephant memory disks and accompanying products. Entries must be received by July 31, 1984. Void where prohibited.

For the Elephant dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect 617-769-8150.



ELEPHANT™ NEVER FORGETS

THIRD PRIZE

(100 winners)



Nylon Duffle Bag. This handsome bag is water repellent and double reinforced at all stress points.

And thousands of Elephant Safari camouflage T-shirts featuring the Elephant logo.

CIRCLE 102 ON READER SERVICE CARD