

# MacA.P.P.L.E.<sup>TM</sup>



Macintosh<sup>®</sup> Arts & Sciences



May 1986 • \$3.00 U.S.

## Macintosh Wizardry

### *Inside:*

- Wizardry File Structure
- A Mac in the Lab
- On Line with Apple Computer, Inc.

### *Reviews:*

- AST - 4000 Mass memory storage
- Microsoft FORTRAN

- Interlace Economical database

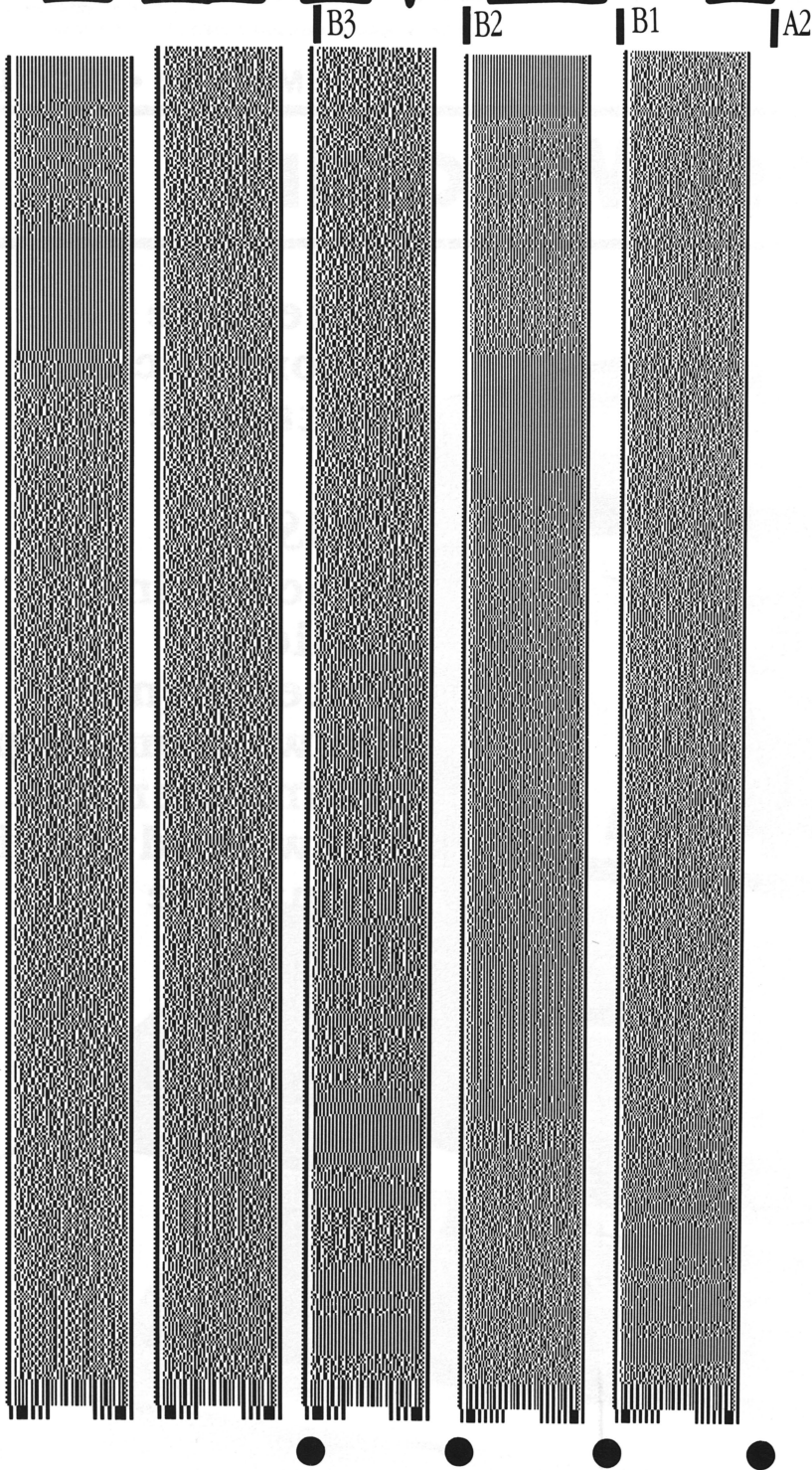
### *Plus:*

- Mac Shrink
- Silicon Intelligence
- News from Apple Computer, Inc.
- New Products for your Mac



Apple PugetSound Program Library Exchange

# HAVE YOU ST



A1  
It's a question more and more Macintosh owners are asking. And no wonder. What everyone is talking about is Softstrip™. The revolutionary technology that is changing the shape of computer software.

The Cauzin Softstrip System is more than just software or data on paper. Because when you invest in this system, you can do much more with your computer, and for far less than you are probably spending now. You can even create and print out your own data strips.

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The data strips on these six pages include six programs and a directory with instructions. They are lettered as follows:

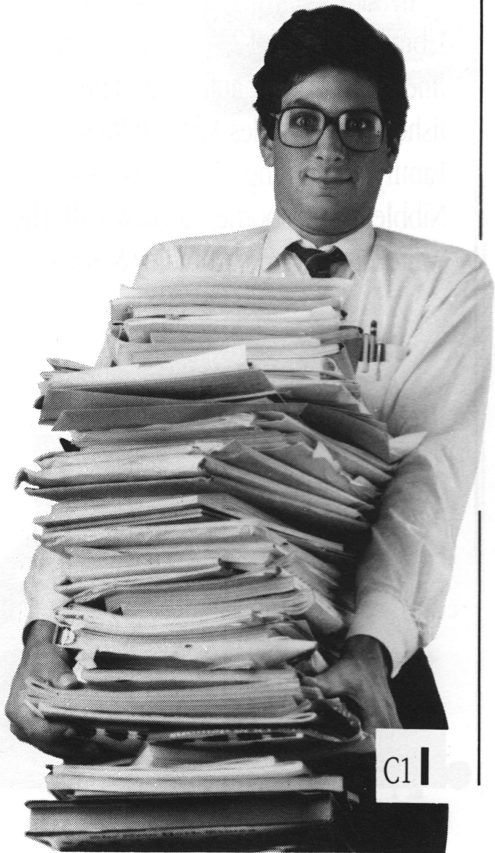
- A — Directory and Instructions
- B — Smile
- C — Slide Show
- D — J Clock
- E — Banner
- F — Mac Bugs
- G — Connect Four

All these programs are brought to you from the Boston Computer Society. Read and enjoy!

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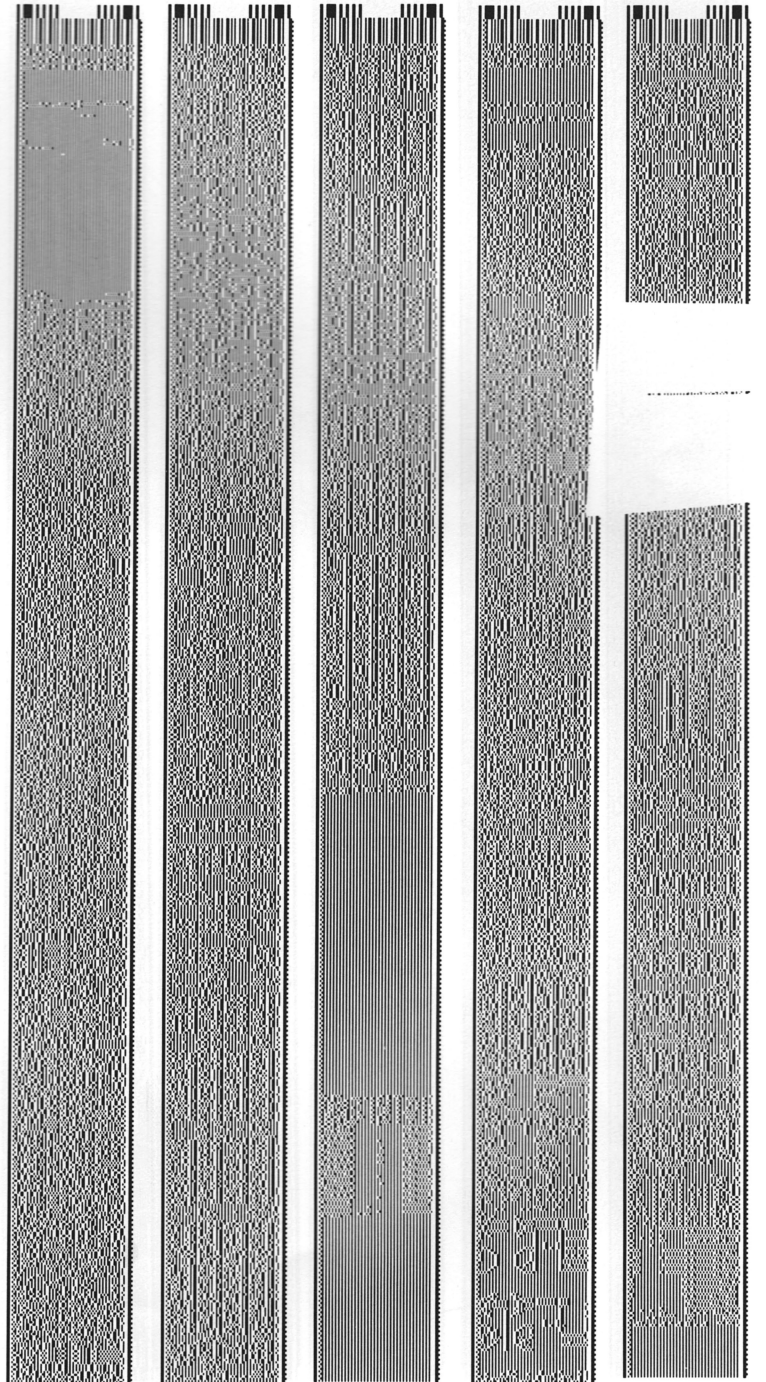
C1 |

C2 |

C3 |

D1 |

D2 |



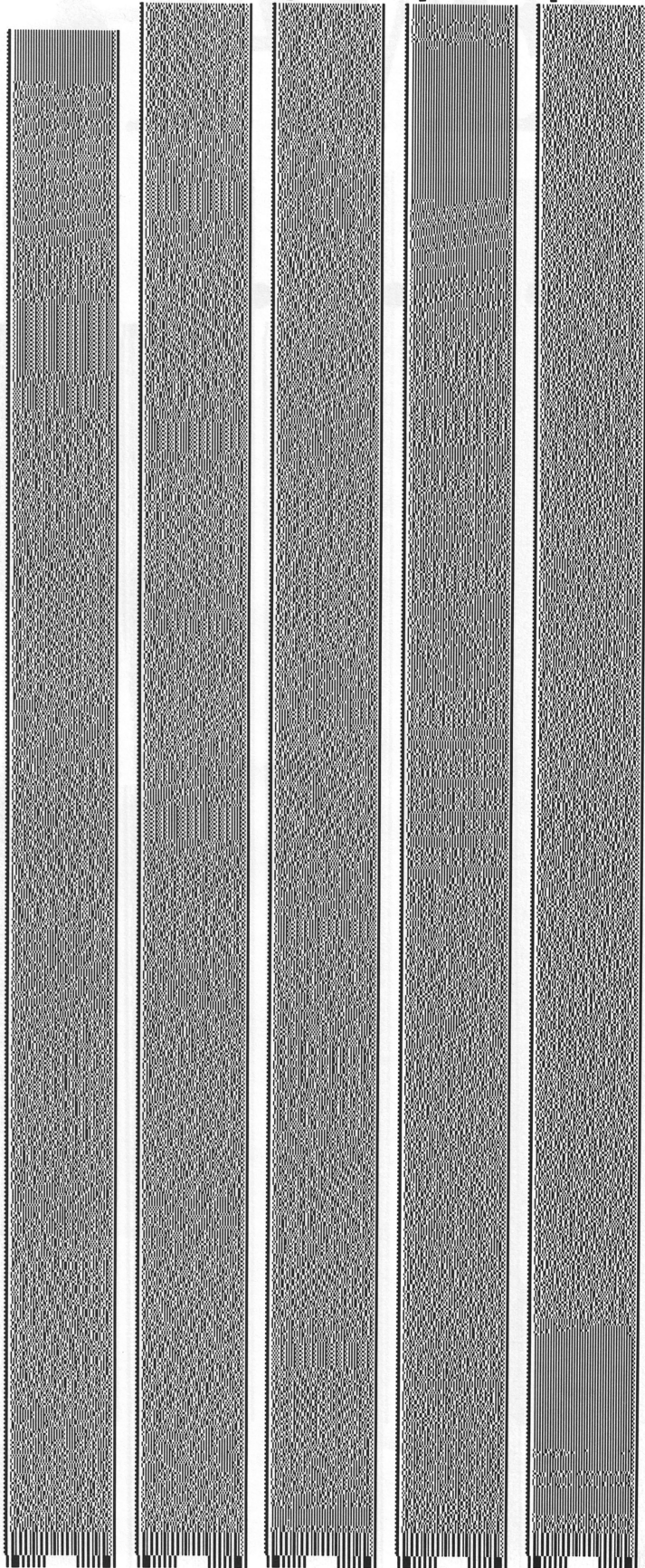
E5

E4

E3

E2

E1



### TAKE OUR ADS (SUCH AS THIS ONE)

It's part of the expanding Cauzin StripWare™ Library containing programs, data, clip art, spreadsheet macros and templates. The Library features a variety of software applications and you'll find new material appearing each month in such leading magazines as MAC Apple, MACazine, Mac User, MacWorld and Nibble Mac.

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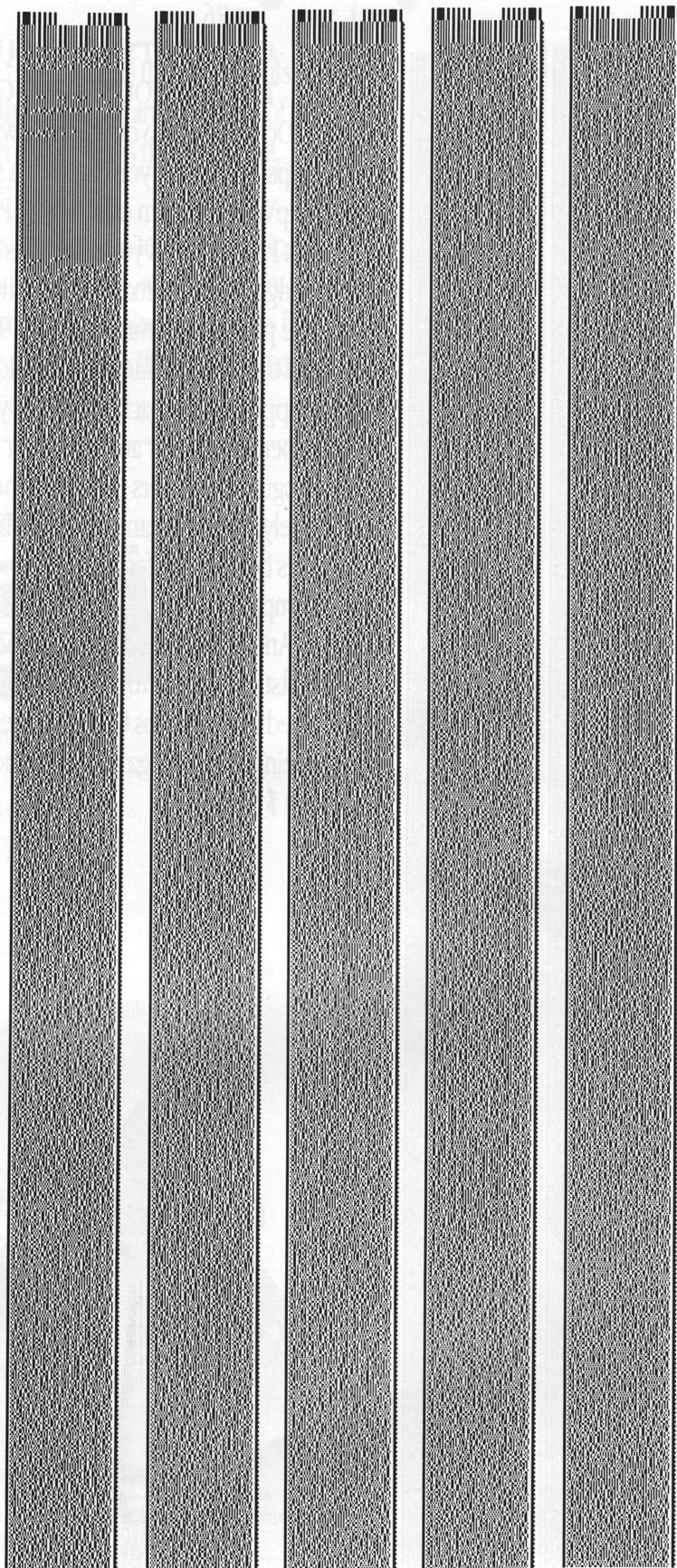
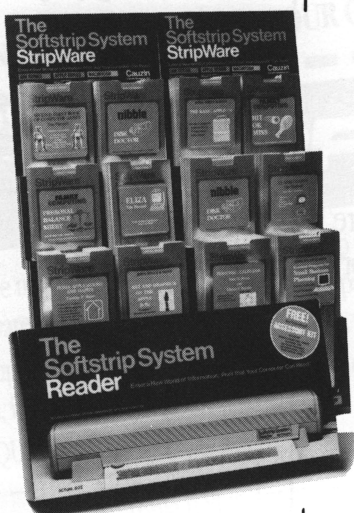


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When you become a Softstrip reader owner, you also get a FREE one year StripWare Club membership with programs mailed to you monthly. You'll even receive a FREE Cauzin Effect Newsletter filled with the latest updates and news about Softstrip developments.

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There is even a StripWare package that lets your Macintosh talk. All for only \$2.98 to \$19.98!



F1

F2

F3

F4

F5

G1

F6

## AND IF THAT'S NOT ENOUGH TO START YOU STRIPPING . . .

Do you want to create your own data strips? Well, now you can with a special StripWare program called "STRIPPER" that lets you print your disk files as strips using your own Imagewriter printer. The printing software is only \$19.95, but just think of the things you could be stripping. Store backup files on your paper. Print, copy and mail your own programs to others easily and inexpensively. Even exchange ASCII or binary files between different types of computers.

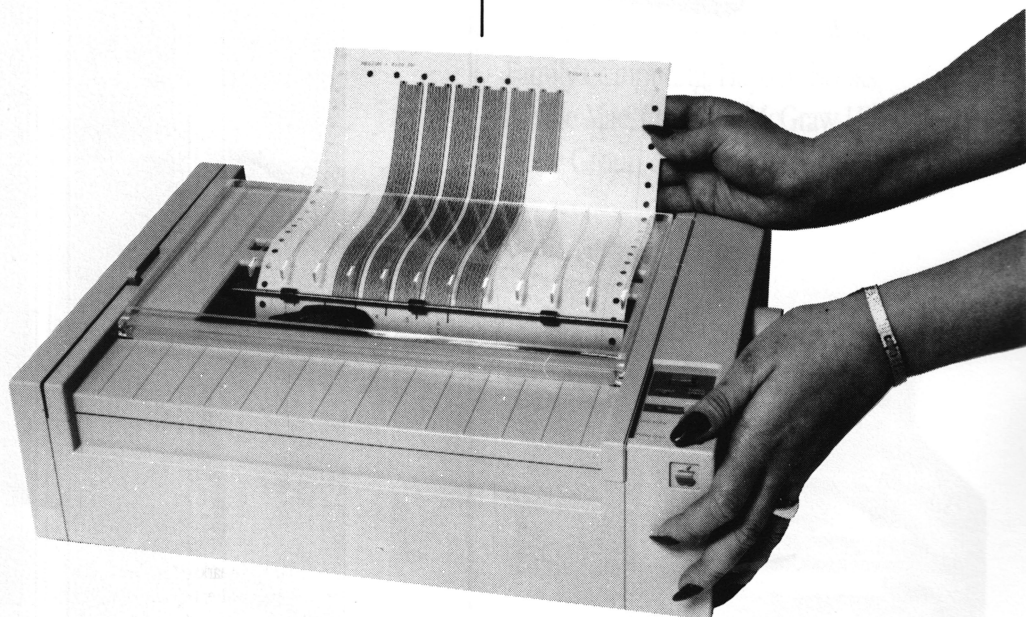
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COMPUTER READABLE PRINT



CIRCLE 83 READER SERVICE CARD

## HOW TO STRIP

It's easy to read strips.

- 1) Just load Cauzin's communications software into your Macintosh.
- 2) Pick up the reader and lay it on the strip.
- 3) To the side of the data strip you'll see a black dot and a short black line (such as the ones found on these pages). These are your alignment marks.

Place the reader so that its loop fits over the black dot and the edge of the reader just touches the black line.

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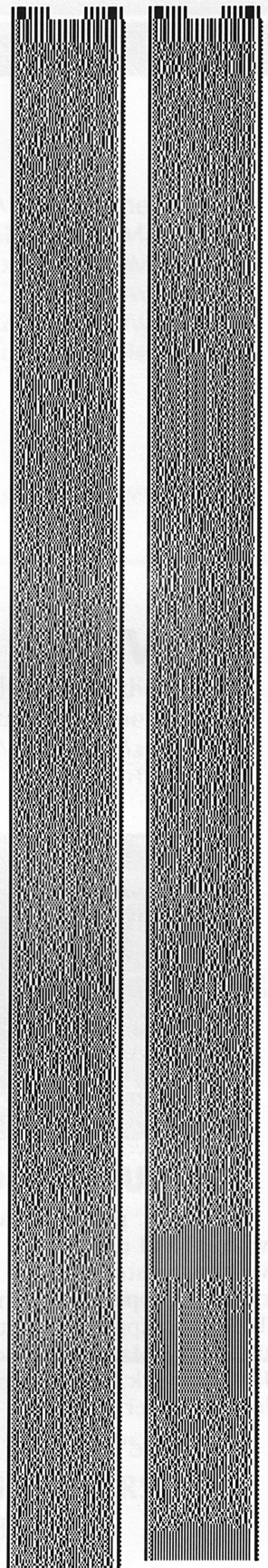
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# MacA.P.P.L.E.

Volume 3, Number 3

May 1986

Official Publication of **A.P.P.L.E. Co-op** "People Helping People with Personal Technology"

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## ABOUT THE COVER

Whether playing games with wizards and dragons, or simply unveiling mysteries—our Macintosh computer opens up a new world. Thanks to Apple Computer, Inc. for use of the Macintosh photo, and to Jack Connick for his help in preparing this cover.

# MACINTOSH NEW PRODUCTS

PRICES VALID THROUGH JULY 1, 1986

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### A BUCKET OF NEW PDS PROGRAMS FOR MAC

#### NEW MASTER CATALOG

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- **Desk Accessories** (1001, 1002, 1003, 1004)
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- **Speech** (4201)
- **Organizer** (1005)
- **Terminal Software** (1501, 1502)
- **Filevision** (1401)
- **Animation** (1601)
- **Games** (4101, 4102, 4103, 4104, 4105, 4106, 4107, 4108)
- **Programming Utilities** (2801)
- **Assembler** (2601)
- **Languages** (2901, 2902, 2903, 2904)
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 (Sorry we do not accept COD or Purchase Orders on individual memberships.)

Each item you order needs:

6. Complete product name (and version if there is more than one product of that type). Specify computer model you are using.
7. Product Code

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# KNOTES FROM THE KNOLL HOUSE

**Lisa & Michael Storrie-Lombardi**

## Endings and Beginnings

Spring always feels like the time to begin new projects and close out all the things you've been meaning to get done all winter. Hibernation in front of the fireplace and the computer screen ends and all kinds of new ideas start milling around competing for time and energy. It struck me that we are probably setting an all time record for ending and beginning projects this spring. (Maybe that means we don't have to do anything next year.) First, the metamorphosis of 32 Little Apples from a newsletter into **Mac A.P.P.L.E.** magazine ranks as the most outwardly evident. Second, whilst writing and editing our little fingers off we've also been impatiently waiting to hear from graduate schools Lisa applied to last fall for her physics doctoral program. While compiling an impressive stack of rejection letters from equally impressive universities (even they make mistakes occasionally), we did receive a nice offer from the local folks at the University of Washington. Let's hear it for staying put which alleviates the need for several new projects such as selling our "knoll house" and moving. "Notes from the Cramped Apartment" loses something as a title for this column. Third, we've just completed our last tax return in which anything gets done by hand. In 1986 we embrace fully computerized financial records.

Fourth, the time has finally come for us turn in our LISA (computer). The arrival of the Macintosh Plus makes MacWorks obsolete. Though nothing can multitask like LISA the speed of the Plus is too addicting to continue moving back and forth between machines. With our old Macintosh the difference wasn't that great and LISA's larger screen gave her an edge. Apple Computer's trade-in program (see News from Apple) and 5-year support commitment give LISA owners a choice and if you use the 7/7 software there's probably no reason to change. But for those of you who run your LISA as a "big Mac" go try a Macintosh Plus today if you haven't already. This should be the last Knoll Knotes from our LISA. Onward with new computer toys!

The real problem in all of this computer turnover actually lies in sorting out the tax consequences. The IRS depreciation and investment tax credit rules don't take into account how fast the computer industry changes and how quickly computers actually depreciate. I guess we'll worry about that next April. Welcome to the May **Mac A.P.P.L.E.** 

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## Mac A.P.P.L.E. Consultants

In addition to the A.P.P.L.E. consultants listed in **Call -A.P.P.L.E.** we are starting an independent list of consultants for Macintosh specific questions. Mac A.P.P.L.E. consultants are unpaid volunteers and perform a valuable service. Before placing a call, make sure you know the time zone you are calling. No calls after 9:00 p.m. please. Sometimes a consultant will have you leave your name and number and later return your call. In all fairness, please expect the return call to be collect.

Our list is short to begin with. Would you like to add your name with your area of interest and expertise? We'd love to have you. Please drop us a note c/o L. & M. Storrie-Lombardi with your qualifications and availability.

	P—Pacific	M—Mountain	C—Central	E—Eastern	
<b>Example:</b>	1:00	2:00	3:00	4:00	
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See page 17 for complete Consultants list.



### The Lowdown on Labels

If you receive your magazine by mail, then there is one little item attached each month that is easy to overlook but which contains some very important information about your status as a member or subscriber. Please take a moment to examine your mailing label. First, carefully check to make sure that your name, address, city, state, and ZIP code are correct. If there is any error, you'll do us all a favor by writing or calling our Customer Services department, who will promptly update our computer records, and the change should appear on your label within about two months.

Next, take a look at the top line. For all U.S. addresses, the middle part of this line is information that relates to the bulk-mail sorting process, which saves both mailing time and money. The information on the upper right shows your unique member or subscriber number and the expiration month. In general, membership numbers are assigned sequentially as people join, and are currently closing in on the 40,000 mark. (We frequently encounter long-time members who proudly sport numbers in the triple digits or lower as a true badge of prestige!) Certain ranges of numbers, such as those starting with "9," are reserved for institutional members or exchange subscriptions with other publications.

The seemingly clear-cut expiration date probably generates more confusion than any other part of the label. Basically it indicates the month during which your last magazine issue will be sent if you fail to renew. However, the cover date of that last issue will be one month later. For example, if your expiration is November 1986, then your last issue will be the one called "December 1986", which is mailed in November. In practice, we usually allow one additional month's grace period beyond that to assure continuity of your subscription if you renew at the last minute. But please don't take any chances, because once you have been placed in the "inactive" category, it may take as much as two months to reactivate.

Another point of confusion stems from the fact that a magazine's production and distribution schedule requires each month's labels to be printed about 6 weeks before you receive the issue. For example, labels for the May issue were actually printed around the 15th of March. Only active members/subscribers whose names were in our computer on that date could be included in the May issue bulk mailing. Thus, any new names or address changes entered after that time would take effect no earlier than the June issue. We hope this gives you a better understanding of the significance of the mailing label information, and appreciate your cooperation whenever problems arise.

### Reader's Choice Card Winners

During the annual membership meeting, a special double drawing was made from the Reader's Choice cards. Congratulations to Dewey Keen of Swartz Creek, Michigan and to John C. Schmidt of San Marcos, Texas!



# THE MACINPLACE

The following items are selected by our editorial staff from the large number of product announcements and news releases sent to us daily. They are presented solely to keep you informed about the current market for Apple related hardware and software. As we have not tested many of these products, appearance here does not necessarily represent endorsement or recommendation by A.P.P.L.E. Further information about items appearing in The Macinplace can be obtained through the Reader Service Card. If you contact any manufacturers directly, please mention that you learned about them in *Mac A.P.P.L.E.*

student will gain a sturdy foundation from the book's introduction to the basic concepts of Pascal, and the more experienced programmer may find more immediate interest in the advanced topics, such as accessing the ROM tool kit and creating applications and programs in Pascal. Cassidy is a noted author of software including the best seller, DOS BOSS for the Apple II. 300 pages, softbound. Price: \$18.95.

CIRCLE 93 READER SERVICE CARD

## Microcomputer Projects with the 68000

**William Barden, Jr.**

Students of electronics and hobbyists now have a do-it-yourself guide to the construction and use of a 68000-based microcomputer. The homemade computer is based on the use of Motorola's 68000 chip. This book comprises mini-tutorials in microcomputer design, 68000 assembly language programming, and Tiny C language. Price: \$22.95. The above four books are available from *Howard Sams Publishing*, 4300 W. 62 St., Indianapolis, IN 46268, (317) 298-5400.

CIRCLE 94 READER SERVICE CARD

## MULTI USER FILE SERVER

Sunol Systems announces SUN\*M.U.F.S. (Multi User File Server) for the Macintosh and Macintosh Plus. SUN\*M.U.F.S. is a FILE SERVER, allowing multiple users to access the same volume and the same files simultaneously. Automating your Macintosh office with this product allows true networking capabilities. It uses Appletalk to network the Macintosh and Macintosh Plus.

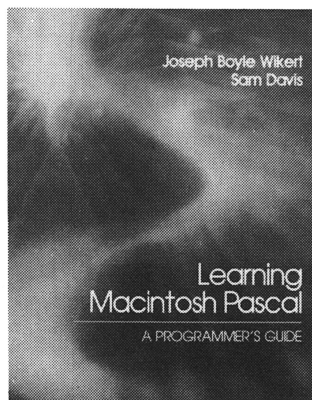
Sunol Systems offers SUN\*M.U.F.S. in the following models:

MUFS-21	MUFS*DISK21MB	Usable Storage	\$2595.00
MUFS-45	MUFS*DISK44.5MB	Usable Storage	\$4,995.00
MUFS-70	MUFS*DISK70MB	Usable Storage	\$5,695.00
MUFS-110	MUFS*DISK110MB	Usable Storage	\$7,595.00
MUFS-160	MUFS*DISK160MB	Usable Storage	\$9,295.00

For prompt delivery contact a Sunol Distributor or Sunol Systems directly. *Sunol Systems*, P.O. Box 1777, Pleasanton, CA 94566, (415) 484-3322.

CIRCLE 95 READER SERVICE CARD

## MACINTOSH BOOKS



### Learning Macintosh Pascal

Learning Macintosh Pascal is a helpful tutorial for beginners, yet comprehensive enough for experienced programmers. The fundamentals of MacPascal are discussed in detail—from the basic structure of a Pascal program to procedures, data types, variables, and arrays. Each chapter includes objectives, handy summaries, and quizzes to reinforce learning. A series of special learning aids called "Mac Facts" run throughout the book, calling your attention to MacPascal rules, tips, and programming techniques.

#### Features:

- Introduces you to the Macintosh desktop and operating system
- Focuses on the unique features of MacPascal, showing you how to create windows and program the mouse
- Provides dozens of short program examples and screen displays

- Explains major concepts of structured programming and top-down design
- Shows how to program graphics, animation, sound, and music using the built-in Toolbox routines
- Explains such advanced topics as pointers, linked lists, trees, stacks, and recursion
- Includes four useful application programs which apply important topics discussed in the book

This book by Joseph Boyle Wikert and Sam Davis is 352 pages, softbound and illustrated. Price: \$19.95. *Scott, Foresman and Company*, 1900 East Lake Avenue, Glenview, IL 60025 (312) 729-3000.

CIRCLE 90 READER SERVICE CARD

### Artificial Intelligence Programming on the Macintosh

**Don Shafer, The Waite Group**

At last, a book that enables beginners to travel to the next computer frontier: artificial intelligence. Ten exciting programs, written in easy-to-learn LOGO for use on the Macintosh but generalized for use on other computers, step you through the basics of AI programming techniques and concepts. From the classic missionaries-and-cannibals problem to natural language processing, this book explains programs and concepts clearly. With each program, the author includes ideas for expanding on the concepts so that you may begin to build your own unique solutions to AI problems. For the uninitiated in LOGO, the author includes tutorials in LOGO as well as in

LISP and Prolog, the three main AI languages. For programmers whose background in BASIC, an appendix shows how to convert the program examples to that language. 380 pages, softbound. Price \$24.95.

CIRCLE 91 READER SERVICE CARD

### C Programming Techniques for Macintosh

**Schilke and Medneiks**

This intermediate-level programming book provides a thorough grounding in the C programming language as it is designed for the Macintosh. The authors discuss the history of the development of C, its relationship to other languages, its syntax, and specific usages. This comprehensive treatment examines the difference between tool kit calls and system calls, illustrates the design of a Macintosh application, and discusses debugging techniques and tools. It allows you to access over 55 ROM tool kit routines and clearly demonstrates how you may use those routines to develop your own programming application in C. 300 pages, softbound. Price: \$18.95.

CIRCLE 92 READER SERVICE CARD

### MacPascal Programming Techniques

**Cassidy and Steinberg**

This book provides a sorely needed overview and interactive teaching guide for the student of Pascal, a dominant language for software development, as well as for the intermediate and advanced Pascal programmers who own a Macintosh. The

## MACINTOSH DUST PROTECTION

Covers Unlimited introduces an exclusive new look in dust protection for computers and peripherals. The "Three-piece suit," is available for the Apple Macintosh. The "suit" is available in black or grey pin-stripe, each with distinctive grey piping. Price: \$36.95. Covers Unlimited, PO Box 381076, Germantown, TN 38183-1076, (901) 754-4465.

CIRCLE 96 READER SERVICE CARD

## MACINTOSH GEOMETRY

Abstract mathematical theories come to life on the screen with Geometry, a new, interactive software program developed by Sensei Software and published by Broderbund Software, Inc. Designed with the help of educators and compatible with all major geometry textbooks, Geometry gives personalized help, serving as an extension of classroom work, a refresher course or a private tutor. The program covers requirements for a full year's geometry curriculum. Geometry takes advantage of the computer's graphic capabilities so users can actively experiment with the basic concepts of geometry. For example, they can prove that the sum of the angles of a triangle is 180 degrees not only by formula, but by creating and moving angles.

Geometry includes more than 340 problems and emphasizes solving proofs. Users can learn at their own pace—reviewing, practicing and solving the kinds of problems they find in their texts, homework and exams. Help is always available in the form of hints, further explanation or answers to problems. Price: \$99.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101, (415) 479-1170.

CIRCLE 97 READER SERVICE CARD

## ZBASIC FOR THE MAC

ZEDCOR announces ZBasic for the Macintosh which will let you tap the Mac's features easier and faster than any other language:

- Window, Menu, Mouse and Dialog support
- Complete TEXT and FONT control
- Quickdraw and ROM calls supported



- Floating Point math accuracy up to 240 digits!
- Integers in the range of +/-2,147,483,648
- MacinTalk voice synthesizer supported!
- AppleTalk Network supported
- Supports both serial ports
- FAST!Sieve Benchmark:  
ZBasic 47.4 seconds  
MBasic 2.1 4684 seconds
- Program and variables up to 8 megabytes
- Full screen editor and ZBasic editor

This version of ZBasic is unbelievably powerful! Options available include an MBasic to ZBasic conversion program for \$14.95 and a high speed Binary Floating Point package for \$39.95. Price: \$89.95. ZEDCOR, 4500 E. Speedway Blvd., #93, Tucson, AZ 85712.

CIRCLE 98 READER SERVICE CARD

## MOVE THAT KEYBOARD

Cable Tech announces MacCable, 12 ft. Keyboard Extension For the Macintosh. With this cable, you can use your keyboard at twice the distance from your computer without cable strain. It has coiled spring-back design which prevents the cable from getting tangled. Price: \$9.95. Cable Tech, 2261 Market Street, San Francisco, CA 94114.

CIRCLE 99 READER SERVICE CARD

## PROTECT YOUR SOFTWARE

First Byte, Inc. announces a new "Patent Protected," copy protection technology that renders bit copiers obsolete. PRO.TEK now offers Software

Publishers and Disk Duplicators a workable long-term protection method that is convenient to use.

PRO.TEK is 100% software based and no hardware keys are needed by the end user to run the protected program. Hard disk support gives end users the freedom to install PRO.TEK on their hard drives. PRO.TEK gives the Publisher the option to specify a percentage of times to ask for the master key diskette. For example, 100% would ask for the key diskette all the time, 50% every other time, or 2% would ask for the key diskette occasionally and at random. Thus, insuring the occasional requirement of the key diskette. Price: Licenses on a metered basis ranging from 40 to 15 cents per copy. First Byte, Inc., 2845 Temple Avenue, Long Beach, CA 90806, (213) 595-7006.

CIRCLE 100 READER SERVICE CARD

## UNIQUE LABELS FOR THE MAC

The new, Version 2 myDiskLabeler released by Williams & Macias Microcomputer Products lets the user design and print unique, high quality, removable labels for 3½" disks.

With myDiskLabeler the user can grab application icons and modify them, or create icons using the Icon Editor or MacPaint. Seven windows provide editing of text and graphics, including: Disk Name, Edge Title, Back Title, Contents, Picture, Owner, and Date. myDiskLabeler reads and sorts directories and saves labels for easy updates. It also supports HFS, Apple's Hierarchical Filing System.

myDiskLabeler provides precision printing of single or multiple labels. Its graphics interface and alignment guide on the Smart Label form help insure

perfect label alignment.

myDiskLabeler is for use with Macintosh (MacPlus, 128, 512 or XL) and Imagewriter printers. It includes full Scrapbook and Clipboard capabilities for even greater creativity in designing labels.

The new Version 2 myDiskLabeler costs \$44.95. For \$54.95, the Color Option myDiskLabeler lets the user design and print color labels (with the Imagewriter II). The myDiskLabeler package comes complete with 54 die-cut Smart Labels designed specifically for the Imagewriter. The labels wrap around the disk edge, have a matte finish, and are removable. Refills are \$5.00 for 54 labels, \$9.50 for 108 labels and \$18.00 for 216. Williams & Macias, Spokane International Airport Business Park, P.O. Box 19206, Spokane, WA 99219, 1-800-752-4400.

CIRCLE 101 READER SERVICE CARD

## EXTENDED APL

Portable Software announces the release of version 3 of its PortaAPL software package for the Apple Macintosh computer. PortaAPL is a full featured interpreter for the standard APL programming language. It contains all of the primitive APL functions, system functions, and system commands as given in the IBM/ACM APL standard, with the exception of shared variables.

PortaAPL contains a number of important extensions to the standard APL language. They are: an easy-to-use full-screen editor; the ASCII character set option; and the Host File System Option. Also, system functions are available for accessing many of the Macintosh toolbox ROM routines such as QuickDraw graphics, communications, sound generation, and menus.

The new version 3 of PortaAPL adds component files, a "quad-FMT" formatter, and Machine Language Functions to the APL language. Component files allow APL arrays to be stored and retrieved from disk files. The implementation is compatible with component file systems found on APL time-sharing systems. The Machine Language Functions feature allows assembly language and C programs to be called from APL functions.

PortaAPL runs on the MacPlus or 512K Macintosh with a single disk drive. It is available directly from Portable Software as well as from its dealers. The PortaAPL package on the Macintosh is priced at \$275.00. Current PortaAPL customers can upgrade to

version 3 for a \$25 fee. The package includes a program diskette, sample APL programs, and a 400-page user's manual. *Portable Software, 60 Aberdeen Ave., Cambridge, MA 02138, (617) 547-2918.*

CIRCLE 102 READER SERVICE CARD

## FAST, COMPACT DRIVE

General Computer Corp. announces Hyperdrive 20, a 10-megabyte hard disk drive which fits inside the Macintosh. Direct connection to the Mother-board means far greater speed. The Hyperdrive 20 must be installed by an authorized technician (cost included in price of drive) It only adds 5 pounds to the weight of the Mac.

The Hyperdrive 20 comes with a backup program on a 3 1/2 inch disk which lets you copy files or drawers. They can be copied to another part of the hard disk or to multiple floppy disks. The printer spooler works with all types of files, not just ASCII text. It also comes with good documentation including an introduction, a section for experienced users called "Quickstart," a tutorial, a reference section and a question and answer section, plus glossary and index. Price: \$2,195. *General Computer Corp., 215 First St., Cambridge, MA 02142, (800) 422-0101 or (617) 492-5500 in Massachusetts.*

CIRCLE 103 READER SERVICE CARD

## PERSONALIZE YOUR DISK COLLECTION

PBI Software, Inc., announces DeskScene—a utility that customizes the Macintosh desktop screen and was written by Bruce Horn, the co-creator of the Macintosh Finder. DeskScene replaces the Macintosh desktop with any MacPaint picture. With DeskScene, you can personalize your disk collection or uniquely "DeskScene" each disk for immediate identification. The MacPaint pictures can be generated either from the MacPaint application or input devices that produce digitized images. DeskScene can randomly change the desktop image on each boot-up, all the user has to do is install more than one picture. The user can instantly test new custom desktop pictures and immediately install them. Neither the DeskScene application nor the MacPaint picture need to

stay on disk, the "kick-start" routine and picture are installed on the System file.

DeskScene is compatible with the Finder, MacPaint, MacWrite, Switcher and most other programs. Price: \$29.95. *PBI Software, Inc., 1111 Triton Drive, Foster City, CA 94404, (415) 379-8765.*

CIRCLE 104 READER SERVICE CARD

## INSTANT ACCESS TO FILES

PBI Software, Inc., introduces HFS LOCATOR PLUS—a desk accessory which expands the versatility of the Macintosh Hierarchical File System by locating, deleting, copying, launching and renaming files..all without leaving the present application. With the Hierarchical File System, the user can have a file in folders within folders, thus making it very easy to "misplace" a file. The HFS LOCATOR PLUS is a desk accessory which allows instant access to files without going to the finder. A joy to the person with hundreds of folders on his hard disk.

From within applications, the user can locate files and the folders that they reside in by date or by partial/matching name. After finding a file, HFS Locator Plus can show info, delete, rename, move to another folder, or even copy the found file. The date find feature in combination with the copy feature is excellent for doing a daily "back-up" of the files. If the launch feature is selected, that selected "found" file will open up immediately after close of present application. Another feature of the program is its ability to create new folders.

HFS LOCATOR PLUS is compatible with all programs under Apple's Macintosh Hierarchical File System format. The optimum configuration for HFS Locator would be with any hard disk drive and a Macintosh. Price: \$24.95. *PBI Software, Inc., 1111 Triton Drive, Foster City, CA 94404, (415) 379-8765.*

CIRCLE 105 READER SERVICE CARD

## NEW TEMPLATES FOR OVERVUE

Two new templates for OverVUE, a powerful relational database package for the Macintosh personal computer, provides a wide range of customized tools for managing mailing lists and personal financial records. OverVUE Mail Manager template and OverVUE Personal Finance template

provide pre-designed macros, report formats, charts, and relation files that set up OverVUE to function as a special purpose program. The templates take advantage of OverVUE's ability to remember series of commands (macros), perform mathematical calculations, relationally join files, compare data in chart form and print in a variety of formats. Both templates include detailed instructions for use.

OverVUE Mail Manager provides specific tools for using OverVUE to manage mailing lists—one of the most common applications of database programs. The template: —prints addresses on labels or envelopes (manual feed or continuous form), and prints test labels; —makes personalized form letters from Microsoft Word documents; —identifies duplicate names, addresses or companies in a mail list; —standardizes inconsistent address and company entries; —sorts for bulk mailing as specified by the U.S. Postal Service; —calculates total weight, piece count and amount due per mailing; —calculates and charts total pieces mailed by city or state.

OverVUE Personal Finance eliminates the need for a separate program to budget and track personal financial transactions by creating accounts and performing a variety of calculations. The template works with OverVUE to: —create accounts such as checking, AutoLoan, Amex, Diners, etc. —calculate running balances of accounts; —code each transaction into a budget category; —select and total bills due; —generate payment records from checks written; —reconcile bank statement; —budget estimated expenses and calculate totals by month or year; —compare budgeted with actual expenses.

Using either template requires OverVUE, currently one of the best-selling database packages for the Macintosh. The templates have a suggested retail price of \$39.95 each. *ProVUE Development Corporation, 222 2nd St., Huntington Beach, CA 92648, (408) 292-2944 or (714) 969-2431.*

CIRCLE 106 READER SERVICE CARD

## GRAPHIC CREATIONS IN 3 DIMENSIONS

Mac Space is the first 3D-CAD program available for the Macintosh which provides its users with the possibility of

simultaneously visualizing four views (TOP, FRONT, SIDE, AXONOMETRY); it also allows them to draw true perspectives and then plot these out directly since the program has built-in drivers for seven different plotters.

The available drawing tools are:

- creation of a rectangle
- creation of any polygon
- duplication of a face (by translation, rotation or symmetry)
- prismatic elevation
- pyramidal elevation
- generation of an object around an axis by definition of an axis, rotational angle and number of edges (lathe)
- real or projected dimensions, area and perimeter of any polygon
- unlimited zoom (+ or -).

Once you have designed an object, you can then reshape it at will in order to obtain the desired aspect. This can be accomplished by using the modifying tools of the right column:

- erase a face
- detach a face
- drag a vertex
- drag an edge
- drag a face
- draft an area (an entire object or only part of it)
- tie the cursor to an existing point

Furthermore any edges, faces or objects can be relocated by linear translation, rotation or symmetry (vertical or horizontal). You can also set the cursor to move freely, on an orthogonal axis or on a grid that you will define. For an accurate drawing, absolute or relative coordinates can be entered with the keyboard; but you can also use the mouse to validate the position of the cursor in one of the windows. A third coordinate can eventually be added. Polar coordinates can be set according to the last point defined, or the center and radius of a circle. Price: \$385.00. *Abvent, 9903 Santa Monica Blvd Suite 268, Beverly Hills, CA 90212, (213) 659-5157.*

CIRCLE 107 READER SERVICE CARD

## NEW 512K

Apple Computer, Inc. announces an enhanced version of its popular Macintosh 512K personal computer that incorporates some of the high-performance features found in its top-of-the-line Macintosh Plus at the same price as the entry-level

Macintosh 512K.

The Macintosh 512K Enhanced will feature an internal disk drive with 800 kilobytes of disk storage capability and 128 kilobytes of read-only memory (ROM) for faster screen updating and file access. The new machine replaces the Macintosh 512K.

The new version includes 512 kilobytes of random-access memory (RAM), a new 800-kilobyte double-sided internal disk drive, 128 kilobytes of ROM and the Macintosh 512K keyboard and mouse. Like other members of the Macintosh family, the Macintosh 512K Enhanced has the same compact design and distinctive, visual user interface.

The 800-kilobyte internal disk drive provides users with faster disk access, double the disk storage capacity and reduced frequency of disk swapping over the former Macintosh 512K. Users can store about 400 pages of text and can save more applications and documents on a single disk. In addition, users can install more printer fonts and desk accessories.

With the ability to read either double- or single-sided 3 1/2-inch media, the 800-kilobyte internal disk drive can run existing Macintosh software or new software written specifically for Macintosh Plus. Apple will offer applications, such as MacDraw and MacProject, in both single- and double-sided formats during 1986. Third-party software publishers will offer double-sided versions of their products as the number of installed Macintosh 512K Enhanced and Macintosh Plus Systems increases.

The new 128-kilobyte ROM chips contained in the Macintosh 512K Enhanced are identical to those incorporated into the new Macintosh Plus. They provide users with access to the Hierarchical Filing System (HFS), which enables users to organize thousands of documents and applications into a logical hierarchy and to conveniently store and retrieve files.

The new features combined in the Macintosh 512K Enhanced enable many software applications to run up to 50 percent faster.

### Growth Paths Provided

Owners of Macintosh 512K computers can upgrade to the Macintosh 512K Enhanced by purchasing the Macintosh Plus Disk Drive Kit. The kit, which requires dealer installation, includes a double-sided, 800-kilobyte internal disk drive, the new ROM chips, the

Macintosh Plus System Tools Disk and a guide to the new features.

Macintosh 512K Enhanced owners wishing to upgrade to a Macintosh Plus can do so by purchasing the following upgrade kits:

- The Macintosh Plus Logic Board Kit. Requiring dealer installation, this kit is for Macintosh owners who want 1 megabyte of internal memory, the option of expanding up to 4 megabytes in the future, and the Small Computer System Interface (SCSI) port. A new main logic board, new rear case to accommodate the new ports, an adapter cable and the Macintosh Plus Owner's Guide are included.
- The Macintosh Plus Keyboard. This features a built-in numeric keypad and cursor keys.

To support customers who recently purchased Macintosh 512K computers, Apple is offering a special rebate on the Disk Drive Kit.

### Rebate Program

Customers in the United States who purchased a Macintosh 512K computer between January 16, 1986, and April 14, 1986 will receive a rebate of \$75 upon purchase of the Macintosh Plus Disk Drive Kit. To receive their rebate, qualified Apple customers must obtain a rebate form from their local authorized Apple dealer, and submit the rebate form to Apple by July 15, 1986. Customers who follow these guidelines will receive a cash rebate directly from Apple.

### Price and Availability

The Macintosh 512K Enhanced will be sold through authorized Apple dealers for a U.S. suggested retail price of \$1,999. The MacWrite and MacPaint software packages will not be included with the Macintosh 512K Enhanced, but are available separately for a U.S. suggested retail price of \$125 each.

Previously available external drives are compatible with the Macintosh 512K Enhanced. The Macintosh 800K External Drive, which replaced the 400K Macintosh External Drive on January 16, has a U.S. suggested retail price of \$499.

The Macintosh Plus upgrade kits for Macintosh 512K Enhanced owners are available now from authorized Apple dealers worldwide. The

Macintosh Plus Disk Drive Kit sells for a U.S. suggested retail price of \$299. The Macintosh Plus Logic Board Kit is \$599 for Macintosh 512K Enhanced and Macintosh 512K owners, and the Macintosh Plus Keyboard is \$129 when sold separately. All prices are U.S. suggested retail. *Apple Computer, Inc., 20525 Mariani Ave, Cupertino, CA 95014, (408) 996-1010.*

CIRCLE 108 READER SERVICE CARD

## PAGEMAKER WORKS WITH THE PLUS

Aldus Corporation would like to make it clear that PageMaker 1.1, the current version, fully supports the Macintosh Plus. In the expanded memory environment of the Macintosh Plus, with either the Switcher or the RAM cache program, PageMaker runs very swiftly.

Aldus Corporation worked very closely with Apple Computer in the development of the new 128K ROMs. Early testing enabled us to implement adjustments in PageMaker 1.1 in preparation for the release of the new ROMs. Since the release of the new ROMs, both Apple and Aldus have uncovered minor flaws. For example, with the new Chooser desk accessory, PageMaker cannot find the LaserWriter unless it is named LaserWriter. You must run the namer install program on the LaserWriter Install disk to re-name your printer if it is called anything else. Also, PageMaker, running under the new Hierarchical File System, occasionally cannot find Aldus Prep and the Help Folder. (Aldus Prep should be located either in the system folder or the same folder as PageMaker. The Help files can be accessed by inserting a disk with the Help folder on it.)

All of these issues have been addressed and we have incorporated the changes in PageMaker 1.2. PageMaker 1.2 will be available from authorized Aldus dealers at no charge to customers. Price: \$495.00. *Aldus Corporation, 616 1st Ave., Suite 400, Seattle, WA 98104, (206) 441-8666.*

CIRCLE 109 READER SERVICE CARD

## ATTENTION HELIX OWNERS

Odesta announces two new services in addition to their technical support for Helix owners.

- Consulting Service providing direction in designing applications and assistance in

overcoming specific development hurdles

- Design Service providing complete application development

The Consulting Service is available for \$10.00 per ten minute increment or fraction thereof.

The Design Service can be contracted to build a full application to your specifications and needs. Internal Helix experts will work individually with your company. The development fee will be quoted based on the complexity of the project.

Technical Support will continue to be free of charge and will be limited to technical issues: i.e. features & routines difficult to figure out from the manual and its supplements, bugs, and bombs. *Odesta, 4084 Commercial Avenue, Northbrook, IL 60062, (312) 498-5615.*

CIRCLE 110 READER SERVICE CARD

## AN INTERPRETER FOR APL

Portable Software announces the release of version 3 of its PortaAPL software package, a full featured interpreter for the standard APL programming language. It contains all of the primitive APL functions, system functions, and system commands as given in the IBM/ACM APL standard, with the exception of shared variables.

PortaAPL contains a number of important extensions to the APL language. An easy-to-use full-screen editor; the ASCII character set option; and the Host File System Option. Also, the system functions are available for accessing many of the Macintosh toolbox ROM routines such as QuickDraw graphics, communications, sound generation, and menus.

The new version 3 adds component files, a "quad-FMT" formatter, and Machine Language Functions to the APL language. Component files allow APL arrays to be stored and retrieved from disk files. The implementation is compatible with component file systems found on APL timesharing systems. The Machine Language Functions feature allows assembly language and C programs to be called from APL functions.

PortaAPL runs on the MacPlus or 512K Macintosh with a single disk drive. Price: \$275.00. Upgrades to version 3 for a \$25 fee. *Portable Software, 60 Aberdeen Ave., Cambridge, MA 02138, (617) 547-2918.*

CIRCLE 111 READER SERVICE CARD



## REBATE ON MACTABLET

Summagraphics Corporation will offer a \$50 rebate to dealers and a \$50 rebate to end-users on its MacTablet graphics tablet now through May 31, 1986.

The promotional campaign surrounding the rebates includes direct mailings to Macintosh user groups and Apple dealers, advertising in leading Macintosh media and an 800 number to answer questions about the program. A special mailing will be made to Apple dealers announcing a separate \$50 rebate program. Anyone purchasing a MacTablet during the rebate program will receive \$50 directly from Summagraphics by sending in the warranty registration card and proof of purchase receipt.

Designed for use with the Apple Macintosh computer, the MacTablet provides 6" x 9" of active work area for all graphics needs including professional drawings, free-hand artwork and mapping. It features the highest resolution of any graphics tablet designed for Macintosh computers and is compatible with all Macintosh software. Price: \$395. Summagraphics Corporation, 777 State Street Extension, Fairfield, CT 06430, (203) 384-1344.

CIRCLE 112 READER SERVICE CARD

## ART WITH THE LASERWRITER

Image Club Graphics announces DigitArt Laser Graphics, a graphics-art-fonts package for the Macintosh and the LaserWriter or any other postscript compatible printer. DigitArt is a compilation of

fonts and images that are postscript-LaserWriter printable. The images were created with MacDraw to utilize the high resolution capabilities of the LaserWriter. No more ImageWriter jaggies!

Now you can easily add quality graphic impact to reports, letters, newsletter, flyers, brochures, signs, ads, labels, etc. DigitArt allows you to jazz them all up with creative designs and headline fonts, all compatible with the LaserWriter. All the pictures you'll ever need? A total of 3 disks full of professional and useful pictures, decorative boarders, cut and paste fonts and graphics you can use "as is" or customize. Price: \$49.95. Image Club Graphics, 2828 19 St. N.E., Calgary, Alberta, T2E 6Y9, (403) 250-1969.

CIRCLE 113 READER SERVICE CARD

## GAME SOFTWARE FOR THE MAC

Backgammon is one of three classic games introduced for the Macintosh by Triple Play. This entertainment disk also includes Mancala (pits & stones) and Deduce (pictorial mastermind). Each of the games offers several degrees of difficulty and multiple menu-selected playing options. The games are fast-paced and challenging, designed with all ages in mind. Disk owners are entitled to play for \$4000.00 in prizes in the Backgammon Triple Play-off. But hurry! This contest ends May 15, 1985! All three games on one disk are available now for only \$39.50 by check, VISA, MC, or UPS COD and may be ordered by mail or by phone from: Triple Play, P.O. Box 6354, Lafayette, IN 47903, (317) 742-5369.

CIRCLE 114 READER SERVICE CARD

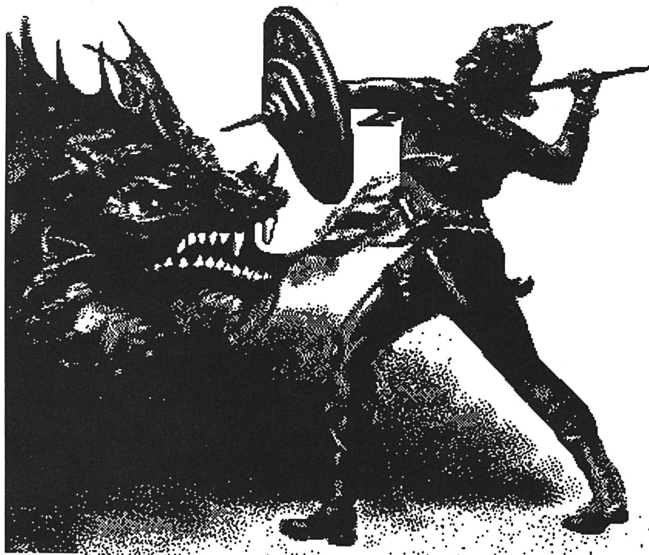
# A.P.P.L.E. CONSULTANTS

Call A.P.P.L.E. consultants are unpaid volunteers and perform a valuable service. Before placing a call, please make sure you know the time zone you are calling. No calls after 9pm please. Sometimes a consultant will have you leave your name and number and later return your calls. In all fairness, please expect the return call to be collect. We are always looking for more consultants. If you see an area that needs coverage, please drop us a note c/o *Charlie Stillman* with your qualifications and availability. The codes to the right of the phone numbers refer to time zones:

P—Pacific    M—Mountain    C—Central    E—Eastern  
Example:    1:00                    2:00                    3:00                    4:00

'C'	Phil Pearson	(603) 362-4297	(E)
Accounting/B.P.I.	Mike Levinson	(713) 524-6747	(C)
Agriculture	Neil Clemmons	(314) 968-9618	(C)
Applesoft	Leon Raesly	(301) 460-0754	(E)
Applesoft (Australia)	Graeme Samways	048-851-541	
AppleWorks	Ina Levinson	(713) 524-6747	(C)
AppleWorks (India)	Arun Nath	660060 ext.609	
AppleWorks/Business (Israel)	Jeanni Spindel	972-052-83732	
Apple IIe (India)	Sanjay Kalra	660060 ext. 610	
Apple III (East)	Carmen Picardi	(603) 895-4447	(E)
Apple III (East)	Harry T. Hanson	(201) 467-0712	(E)
Apple III (East)	Stuart Yusem	(609) 822-9306	(E)
Apple III (West)	Bob Huelsdonk	(206) 542-7122	(P)
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# Wizardry Files Revisited



Gregory Quinn

I suffer from a double curse of a sort. I am both a Macintosh addict and a Wizardry addict. So when I bought my Mac, I quit playing Wizardry on my now departed Apple II, convinced that Sir-Tech would shortly release a version of Wizardry for the Mac. After many months of waiting for the game, I am not disappointed. But now I have met and conquered Werdna. Still intrigued by the game, I became curious about the construction of the Macintosh character roster. After rereading "Backdoor Wizardry" in the August 1984 issue *Call-A.P.P.L.E.*, I plunged ahead. What follows is the result of my explorations.

To look at the contents of the roster, you will need a disk utility like "fedit" or "MacTools." The roster file is represented by the castle icon and the roster can hold up to twenty characters. All the information about a character is contained in 186 (\$B9) bytes. There are twenty of these blocks within the roster file, one for each character. All these blocks are continuous with no unique indexes within the roster to show where one character ends and another begins. The Wizardry program knows where to stop reading, but you will need a little hexadecimal math to keep things straight until you become familiar with the "look" of the file. Table I shows the starting location of each of the characters in the roster. All of the byte references in the following discussion are relative to the 186 bytes contained in

the individual character's data file.

The first byte (\$00) is the length of the character's name. The next fifteen bytes (\$01 to \$0F) are the ASCII codes in hexadecimal for the letters in the name. Quite a few of the following bytes are skipped. In the Apple II version, this space is reserved for the player's password for the character.

The next two pieces of data are strictly tabular. The character's race is in byte \$21. The coding for race is: \$01-human, \$02-elf, \$03-dwarf, \$04-gnome, \$05-hobbit. Byte \$22 is the code for the character's class: \$00-fighter, \$01-mage, \$02-priest, \$03-thief, \$04-bishop, \$05-samurai, \$06-lord, \$07-ninja.

Bytes \$24 and \$25 represent the character's age in weeks. These two bytes form a four digit hexadecimal number where the low nybble of byte \$25 represent the least significant digit and the high nybble of \$24 represents the most significant digit. So if the data in these two bytes is \$0470, that translates to an age of 1136 weeks, or a little less than 22 years.

Byte \$26 contains the status of the character. The status codes are: \$00-fully healed, \$01-afraid (effects of a fear spell), \$02-asleep, \$03-paralyzed, \$04-stoned, \$05-dead, \$06-ashes, \$07-lost forever. Byte \$27 shows the character's alignment. The codes are: \$01-good, \$02-neutral, \$03-evil. Mixing an alignment with a profession to produce an illegal combination, such as a

good ninja, does not seem to cause any problems.

Byte \$28 through \$2D contain the values for the characters attributes. The structure of this information is very different from the Apple II version. For the Macintosh, the value for each attribute is simply the hexadecimal equivalent to the decimal value. The attributes are strength, intelligence, piety, vitality, agility, and luck respectively for each byte.

The amount of gold the character has is found in bytes \$34 through \$37. As with age, the total gold is represented by a hexadecimal four byte number. Byte \$39 is the number of items that the character possesses. Wizardry simply changes this number when possessions are removed; it does not delete the information of the removed piece of equipment. Each item is described with five bytes out of a field of six bytes. A character can possess up to eight items. The starting locations for each item are \$3A, \$40, \$46, \$4C, \$52, \$58, \$5E, and \$64. Within the six bytes, the first byte shows whether the item is equipped (\$01) or not (\$00) and the second byte indicates whether the item is identified (\$01) or not (\$00). Byte three is the curse status (\$01-cursed, \$00-not cursed). Byte four is skipped and bytes five and six describe the possession. Byte five is the high byte and it is always set at \$00 for this scenario. In the Apple II version, this byte is assigned values in different scenarios. This will probably happen in the (hopefully) future Macintosh scenarios. Byte six contains the identifier for item itself. Table II shows the identifier code, the Apple II description, and the Macintosh description. The Apple II description is given to show the magical effect of the items.

Bytes \$6B through \$6D is another hexadecimal number, six digits in size, representing the total number of experience points accumulated by the character. Bytes \$6F and \$71 are redundant data, showing the current level of the character in both bytes.

Byte \$73 contains the current number of hit points of the character, while byte \$75 reflects the maximum number of hit points that the character can have at his/her current level.

Bytes \$76 through \$7C represents all the spells that the character has in his/her spell book. Each byte represents a group of spells, with each spell's code added together to show the contents of the spell book. See Table III for the spell

codes and their position in the group of bytes. Each odd byte from \$7F to \$99 contains the number of spell points a character has at each level for each type of spell (mage or priest). Bytes \$7F to \$8B are the mage spells; bytes \$8D to \$99 are the priest spells. The maximum value that can appear in these bytes is 9.

The armor class of a character is in bytes \$9E and \$9F. If the armor class is 0 through 10, the bytes will show a value from \$0000 to \$000A. If the armor class is -1 or greater (or less depending on your point of view), the armor class is the value of these bytes subtracted from \$FFFF. For example, an armor class of -5 is five less than \$FFFF, or \$FFFB.

Bytes \$B3, \$B5, and \$B7 show the character's displacement from the castle east, north, and levels down respectively. Putting \$0 in each byte returns the character to the castle.

Bytes \$B8 and \$B9 contain the character's awards. \$01 in \$B8 and \$80 in \$B9 grants the awards of Elite Adventurer and Guildmaster to the character. There it is. Fortunately, some of the more confusing data storage in the Apple II version has been replaced by more straightforward methods. I would like to thank George T. Miller, Jr. for his work to produce "Backdoor Wizardry," without which I would have spent much more time sorting out the contents of the Macintosh files.

TABLE 1

Starting Addresses for Character Data

Character	Block	Address
1	0	\$0000
2	0	\$00BA
3	0	\$0174
4	1	\$002E
5	1	\$00E8
6	1	\$01A2
7	2	\$005C
8	2	\$0116
9	2	\$01D0
10	3	\$008A
11	3	\$0144
12	3	\$01FE
13	4	\$00B8
14	4	\$0172
15	5	\$002C
16	5	\$00E6
17	5	\$01A0
18	6	\$005A
19	6	\$0114
20	6	\$01CE

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**TABLE 2**

**Wizardry Item List**

Lo Byte	Macintosh	Apple II
01	Long Sword	Long Sword
02	Short Sword	Short Sword
03	Anointed Mace	Anointed Mace
04	Anointed Flair	Anointed Flail
05	Staff	Staff
06	Dagger	Dagger
07	Small Shield	Small Shield
08	Large Shield	Large Shield
09	Robes	Robes
0A	Leather Armor	Leather Armor
0B	Chain Mail	Chain Mail
0C	Breast Plate	Breast Plate
0D	Plate Mail	Plate Mail
0E	Helm	Helm
0F	Dios Potion	Dios Potion
10	Latumofis Potion	Latumofis Portion
11	Sword of Slicing	Long Sword + 1
12	Blade of Biting	Short Sword + 1
13	Mace of Pounding	Mace + 1
14	Wand of Iron	Staff of Mogref
15	Scroll of Katino	Scroll of Katino
16	Padded Leather	Leather + 1
17	Shiny Chain	Chain Mail + 1
18	Sturdy Plate	Plate Mail + 1
19	Iron Shield	Shield + 1
1A	Body Armor	Breast Plate + 1
1B	Scroll of Badios	Scroll of Badios
1C	Scroll of Halito	Scroll of Halito
1D	Sword of Swishes	Long Sword -1
1E	Epee of Dismay	Short Sword -1
1F	Mace of Misfortune	Mace -1
20	Study Staff	Staff + 2
21	Dragon Slayer	Dragon Slayer
22	Helm of Hardiness	Helm + 1
23	Rotten Leather	Leather -1
24	Corroded Chain	Chain -1
25	Broken Breast Plate	Breast Plate -1
26	Screwy Shield	Shield -1
27	Ring of Jewels	Jeweled Amulet
28	Scroll of Badios	Scroll of Badios
29	Potion of Sopic	Potion of Sopic
2A	Sword of Slashing	Long Sword + 2
2B	Epee Excellence of	Short Sword + 2
2C	Mace of Power	Mace + 2
2D	Scroll of Lomilwa	Scroll of Lomilwa
2E	Scroll of Dilto	Scroll of Dilto
2F	Gloves of Copper	Copper Gloves
30	Treated Leather	Leather + 2
31	Elven Chain	Chain + 2
32	1st Class Plate	Plate + 2

33	Shield of Support	Shield + 2
34	Helm of Evil	Helm (Evil) + 2
35	Potion of Dial	Potion of Dial
36	Ring of Shielding	Ring of Porfic
37	Were Slayer	Were Slayer
38	Mage Masher	Mage Masher
39	Mace of Snakes	Mace Prot. vs. Poison
3A	Wand of Silence	Staff of Montino
3B	Blade Cusinart	Blade Cusinart
3C	Ring of Rigidity	Amulet of Manifo
3D	Wand of Conflagratration	Rod of Flame
3E	Chain of Evil	Evil Chain + 2
3F	Neutral Plate	Neutral Plate Mail + 2
40	Shield of Evil	Evil Shield + 3
41	Ring of Suffocation	Amulet of Makanito
42	Ring of Movement	Diadem of Malor
43	Scroll of Badial	Scroll of Badial
44	Epee of Disaster	Short Sword -2
45	Dagger of Slicing	Dagger + 2
46	Morbid Mace	Mace -2
47	Bent Staff	Staff-2
48	Dagger of Speed	Dagger of Speed
49	Robes of Wailing	Cursed Robe
4A	Leather of Loss	Leather -2
4B	Chain of Curses	Chain -2
4C	Devil's Breast Plate	Breast Plate -2
4D	Shield of Nothing	Shield -2
4E	Helm of Hangovers	Cursed Helmet
4F	Breast Plate of Boons	Breast Plate + 2
50	Gloves of Silver	Silver Gloves
51	Saber of Evil	Evil Sword + 3
52	Soul Slayer (E)	Evil Sword + 3
53	Dagger of Thievery	Thieves Dagger
54	Armor of Heroes	Breast Plate + 3
55	Armor of Lords	Lord's Garb
56	Murasama Blade	Murasama Blade
57	Shuriken	Shuriken
58	Armor of Freon	Chain Prot. vs. Fire
59	Armor of Evil	Evil Plate + 3
5A	Shield of Defense	Shield + 3
5B	Ring of Healing	Ring of Healing
5C	Ring of Dispelling	Ring Prot. vs. Undead
5D	Ring of Death!	Deadly Ring
5E	Werdna's Amulet	Werdna's Amulet
5F	Statuette of Bear	Statuette of Bear
60	Statuette of Frog	Statuette of Frog
61	Key of Bronze	Bronze Key
62	Key of Silver	Silver Key
63	Key of Gold	Gold Key
64	Blue Ribbon	Blue Ribbon

**TABLE 3**

**Spell**

Spell	Byte	Hex Value
N/A	76	01
Halito	76	02
Mogref	76	04
Katino	76	08
Dumapic	76	10
Dilto	76	20
Sopic	76	40
Mahalito	76	80
Molito	77	01
Morlis	77	02
Dalto	77	04
Lahalito	77	08
Mamorlis	77	10
Makanito	77	20
Madalto	77	40
Lakanito	77	80
Zilwan	78	01
Masopic	78	02
Haman	78	04
Malor	78	08
Mahaman	78	10
Tiltowait	78	20
Kalki	78	40
Dios	78	80
Badios	79	01
Milwa	79	02
Porfic	79	04
Matu	79	08
Calfo	79	10
Manifo	79	20
Montino	79	40
Lomilwa	79	80
Dialko	7A	01
Latumapic	7A	02
Bamatu	7A	04
Dial	7A	08
Badial	7A	10
Latumofis	7A	20
Maporfic	7A	40
Dialma	7A	80
Badialma	7B	01
Litokan	7B	02
Kandi	7B	04
Di	7B	08
Badi	7B	10
Lorto	7B	20
Madi	7B	40
Mabadi	7B	80
Loktofeit	7C	01
Malikto	7C	02
Kadorto	7C	04



# Scientific Uses for the Macintosh

William K. Dolen, M.D.

A Macintosh for the laboratory? Sure. Most of us can't afford time charges for a mainframe and have trouble getting time on the hospital's minicomputer. Therefore, many research facilities have personal computers placed at strategic locations. The problem with most microcomputers is that many labs have a brisk turnover of research fellows and other personnel. By the time one learns the intricacies of machine operation, the operating system, and some of the popular programs, it's time to move on. The Mac is an attractive machine because its intuitive hardware and software design allows productive use from day one with only minimal orientation sessions. Let's briefly examine the computing needs of academic medicine and see how the Mac fits in. Future articles will provide detailed software evaluations and helpful hints for maximizing productivity using the "Mighty Jobs Machine."

## Word Processing

Some people get a Mac solely because of the machine's word processing ability. I use MacWrite 4.5 extensively for preparation of lecture outlines and handouts, patient education handouts, forms for use in research projects, research protocols and grant proposals, resumes, and scientific papers. Dot matrix printouts are not suitable for most of these purposes, but final draft printouts can be given to a secretary for typing, or the finished product can be printed on a LaserWriter.

## Presentation Graphics

Medical lectures and research presentations are almost always given from 35mm slides. Every medical center

has illustration and photography services for preparation of lecture materials, but these services are expensive and quality illustrations take time to prepare. Sometimes results of research are available only hours before a talk and there is not time to have an illustrator make graphs. Thus, the quality of slides presented at lectures and major medical meetings range from abysmally poor to elegant.

At the 1985 Aspen Allergy Conference, several of the speakers had slides prepared with a Mac and ImageWriter. These could have been printed and photographed on the morning of presentation; although they were printed on a dot matrix printer, the quality was excellent. Text slides can be made with MacWrite, Microsoft Word, or MacDraw, and several graphics programs (I use Jazz with MacDraw) can create nice looking graphs from research data. Publication quality

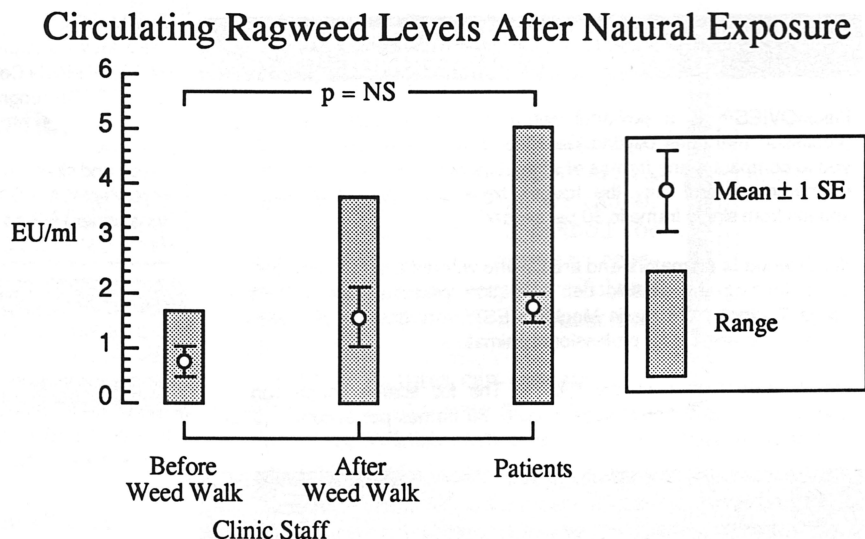
materials can be produced on a LaserWriter (see Figure 1) in a fraction of the time (and cost) it would take a professional illustrator using mechanical drawing methods.

Additionally, the Mac and LaserWriter can be used to prepare poster presentations. A graphics artist would charge about \$500 to make a fairly simple poster that can be done for about \$30, \$10-20 of which would go for renting time on someone's LaserWriter. Because the Mac and LaserWriter are such a formidable pair, they are appearing in the medical illustration departments of some of the country's major academic centers.

## Data Acquisition

The Mac has two serial interfaces, allowing connection to a variety of instruments which also have serial ports. Using the Imagewriter cable, I have

FIGURE 1



connected my Mac to an automatic ELISA plate reader, which sends 96 optical density readings to the computer for analysis by a Microsoft BASIC program. Programs for doing this are in the public domain and only need a few modifications to run on the Mac. Additionally, at least one manufacturer of ELISA plate readers sells an entire system bundled with the Mac.

A number of precision digitizing instruments permit input of data for subsequent analysis. If the thought of measuring a few thousand allergy skin test responses by manual planimetry is depressing, consider getting a digitizer.

### Data Storage

The spreadsheet and database programs so popular with conventional microcomputers are available for the Mac in versions that are far easier to learn and use than their conventional computer counterparts. Thoughtful use of these programs will allow creation of text files suitable for presentation to a statistics program.

### Statistics

Although the use of statistical testing dates from the 19th century, the use of these procedures in the presenta-

tion of scientific data has become routine only in the past twenty years. The classic mainframe statistics packages which permitted this revolution are now available in Big Blue (you know what I mean) microcomputer versions, and hopefully will come out in Macintosh translations now that FORTRAN compilers are available. Meanwhile, several new statistics packages written for the Macintosh are being advertised and warrant careful evaluation.

### Data Analysis


Specialized, esoteric data analysis programs are in the public domain. The best source of these is the Biomedical Computing Technology Information Center, Room 1302, Vanderbilt Medical Center, Nashville, Tennessee 37232. Listings of the programs in the BCTIC are available free of charge; most are written in BASIC or FORTRAN but will need some modification to run on the Mac.

### Telecommunications

The National Library of Medicine's MEDLINE database contains thousands (if not millions) of citations, covering the medical literature for

about the past twenty years. MEDLINE has recently sponsored training courses for medical professionals who want to use the service directly. Other firms buy the MEDLINE tapes for inclusion in their database services. I have used the MEDLINE service offered by Knowledge Index (Dialog Information Services, Palo Alto) for the past three years. Usually, assisted by the annotated "Medical Subject Headings" (National Library of Medicine, Bethesda), I "pre-search" the data base at home, taking a list of the most successful keywords to the medical librarian.

### Summing Up

As more software becomes available for the Macintosh, as more of us are finding out that there's no real need to spend time learning what to do with "> A:" and function keys, as hardware improvements are expanding the Mac's abilities and as publication quality graphics can be made on the LaserWriter, the Mac is finding a place in the laboratory. In future articles, I hope to expand on some of the above areas, as well as explore other uses. If you are using a Mac in your lab, or in any medical or scientific context, send me a description of what you're doing. 

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# Expert Systems. . . Another Approach

**Ian D. Kitching**

Articles about Expert Systems were the rage last year, yet to most people the term "Expert System" still refers to something esoteric and at the forefront of computer science. However, there is nothing magical in the term or the technology required to build such a system. Expert Systems are just that: systems that can do what an expert in a given field can do.

A database management program has the ability to store and retrieve information, and once information has been stored, the computer system can be considered an expert within the confines of this information. Therefore, a personal computer and a database management program being used to catalog a library could be described as an Expert System. Given the authors name, the computer, within a matter of seconds, can detail all the book titles by that author together with catalog numbers and locations of the books in the library. Database programs are used for a multitude of different tasks on the vast majority of personal computer systems. Each of these systems is an Expert System in a given field.

## Consumer Education is Essential

This example may appear overly simplistic to those of you who understand computer technology, but it is very important for the rest of us to understand and learn to use the power of these personal computer systems in our daily lives. Ninety-five percent of the general public do not understand and can never use the latest incredible innovations in computer technology unless the technology can be expressed in everyday terms.

Consumer education in the compu-

ter industry is of paramount importance to the microcomputer industry because, over the last two years, the reduction in sales can, to a certain extent, be attributed to the industries' inability to help the consumer see uses for computer systems beyond wordprocessing, accounting, and spreadsheets. Consumers are not able to assimilate futuristic concepts with the computer systems of today even though these systems actually have the capability to perform the tasks conceived by many to be futuristic.

## The Framework Exists

Apple's Macintosh computer can perform some extremely interesting and useful tasks using software packages that are readily available. However, only when we read or are told of the possibilities in our own terms, without the obstacle of computer jargon, can we begin to really use the system.

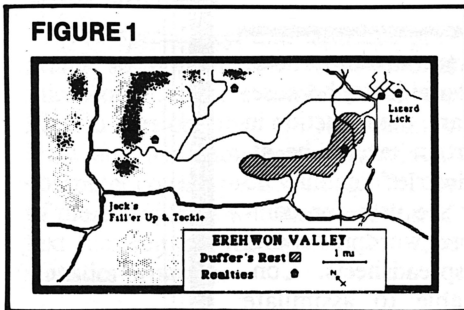
If we read in *The Complete Macintosh Source Book* or *The Mac Buyer's Guide* of a software package called TalkShow which has the ability to make talking pictures and link these pictures together, we naturally assume Rune Software intended it for use in business presentations and at functions requiring a talking slide-show. What we cannot conceive is that here is a method for those of us without computer experience to easily create very powerful and useful Expert Systems in almost any field we desire.

Talking pictures can contain more than one link, so we are able to decide, by pointing with the computer's mouse, what the subject of the next talking picture will be. That is, if we pointed and clicked with the mouse on one area, the next picture will describe that particular

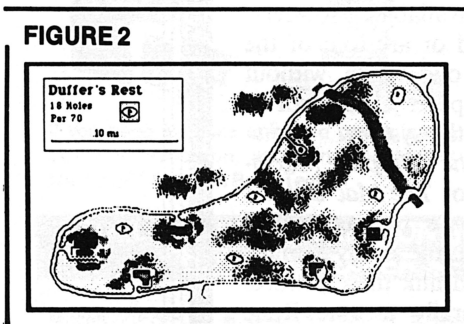
area in greater detail. Whereas if we had clicked on another area, a different picture would appear.

An example of this concept may be seen from these pictures. The first picture on the computer screen is a map of Erehwon Valley, (Figure 1) where you will see Duffer's Rest Golf Course (the diagonally shaded area) and a very small house situated above Lizard Lick.

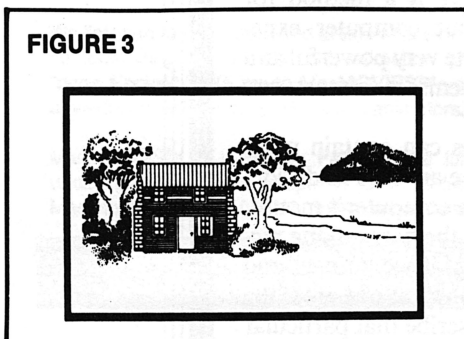
If we click on Duffer's Rest Golf course, the next picture (Figure 2) would relate to and discuss the golf course. However, if we click on the small house above Lizard Lick, the next picture would relate to and discuss the house (Figure 3).



Then, from the picture of the golf course or the house, we can click again with a similar choice as to the subject of the next picture. As there is no limit to the number of choices available on any picture, in this example we could just as easily have selected Jack's Fill'er Up & Tackle, any of the other properties, the hills in the background or any of the roads.



A very powerful Expert System could easily be built from this simple beginning, to almost any size, which



deals with one specific field of information or many different fields. Any form of information, knowledge, or experience that can be described by pictures, speech and text is suitable and can be used to build an Expert System.

## Expert Systems In Any Environment

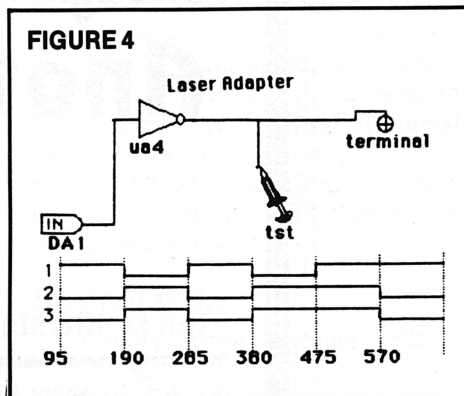
Teaching and training are obvious examples of the usefulness of such a system. The pictures could be used in conjunction with a series of questions and multiple choice answers where children would pass to the next level only on the correct answer. Smaller children would play with a system which produces different patterns and noises when they click the mouse in the left, right, top and bottom regions of the screen. Of course, the children would have no idea they were learning reading readiness. They would just be having fun.

Even the talking slide-show we discussed as a business function can make other very important contributions. Pictures in the slide-show are timed to appear after a pre-selected interval. By selecting no time interval, the pictures appear one after another, almost instantaneously, producing animation. Can you imagine children's and teenager's enjoyment when given the ability to scriptwrite and produce their own adventure stories or games, with each storybook character speaking or moving? By inventing the story plot, finding or drawing the appropriate pictures, typing the speech and text and using logic to sequence the pictures, learning becomes fun.

When considering the usefulness of an Expert System in your own field of specialist knowledge, do not restrict your imagination within the guidelines and examples mentioned here. Design engineers may, for example, dismiss the idea on the basis that teaching or training is not a requirement of his/her employment or home environment. However, the engineer's designs will eventually be manufactured and distributed as a product. If the engineer had produced an Expert System for fault analysis of the product, eventual repair would be easier, less time consuming, and require less specialist knowledge.

In this example, the picture (Figure 4) shows part of a Laser Adapter circuit and indicates to a technician where to place the probe "TST." The Expert System may then ask the technician

which of the waveforms 1, 2, or 3 is similar or the same as that now shown on the technician's oscilloscope. An answer of 1 (by clicking the mouse on the numeral 1) would indicate a different fault than an answer of 2 or 3.




By following the technicians "description" of the fault through a number of similar pictures and questions, the Expert System can eventually diagnose the probable cause of the fault and suggest the part(s) that require replacement.

## Conclusions

Do not make the mistake of waiting for software developers to build Expert Systems designed specifically for your own environment because these systems will never materialize. Software developers do not possess your specialist knowledge, nor will it ever be considered commercially viable to obtain the specialist knowledge from experts because of the very fact that the resultant system would be too specialized to sell in commercial quantities.

If you are a doctor, dentist, or lawyer and need an Expert System to explain procedures to clients, talking pictures may be the answer. Marketing, sales, and distribution efforts may benefit from audio-visual catalogs or Expert Systems to explain products. Novelists, playwrights, television or motion picture technicians, and graphics artists could use talking pictures to conceptualize their work.

The most important aspect to consider is that we, as non-computer programmers, now have the ability to give the computer our own expert knowledge in a simple three step process:

1. drawing, photographing or using existing MacPaint pictures
2. typing the words that each picture will speak and
3. linking the pictures together. 

# A Modemside Chat: Straight from the Horses' Mouth

On the evening of our April Lisa/Mac S.I.G. meeting several hundred sites from around the world linked together to teleconference with the leaders of Apple, Inc. Members of the Apple Team included Jean-Louis Gasee, Guy Kawasaki, and Dan Cochran. The entire conference lasted several hours and had a fair amount of "cross-talk." We have edited the proceedings extensively to bring you some of the key topics covered. We have tried to keep the spirit and humor of the proceedings of the 4/8/86 Apple Conference on Compuserve (eds).

**Q.** *I bought my 512K Mac in December thru a university. I can't get the upgrade with rebate thru them. Can I go to a regular dealer and get the upgrade and get a rebate? This is a simple policy question that no one at any level at Apple seems to be able to answer.*

**A.** (Apple Team) We agree that you deserve an answer. We think that you can take it to a dealer, buy the upgrade, and get the rebate. We'd call Bud Colligan (Univ. Sales) and ask. You might wish to call him tomorrow at (408) 973-4114.

**Q.** *(Not recorded but obviously about Pascal copy protection, eds.)*

**A.** (Apple Team) Macintosh Pascal 2.0 is not copy protected!!!! We also guarantee that it, like all software, has at least one bug, but we reserve the right to fix it and introduce another version at any moment.

**Q.** *(Jay O'Connor) when can we expect to see the 512K development system Smalltalk, and what future Macintosh architectures are being (developed)?*

**A.** (Apple Team) Dan here. The Macintosh Programmer's Workshop, including Macintosh Workshop Pascal

and Macintosh Workshop C will not ship before the fall. I expect to have a "brown bag" version available through non-retail channels sometime in late summer. Smalltalk is available today and will be a real retail product in 1987 and will incorporate a Macintosh User-Interface. This is version 1 and is available from our mail-house. The order form for Smalltalk is in the Macintosh Software Supplement.

**Q.** *(Dave Harvey) When will ROM fix for 3.5" drive bug reach dealers?*

**A.** (Apple Team) Pete, here. I am currently trying to find out the exact answer for half a dozen other folks. I understand that there is an upgrade policy. Until I get a firm answer, I can't say anymore. If anyone concerned would send me Email, I will let you know when. That acct # is 76703,3030 to Pete Mc Donald.

**Q.** *(Mike) I think you might have answered this but, I keep reading, especially in Mac Revealed, about the Mac Pascal Compil.*

**A.** (Apple Team) Dan said that it will not be out before fall. By the way, just to prevent confusion, the previous question about the 3.5 ROM bug was an Apple II question.

**Q.** *(Phil Hutchison) I recently purchased a Mac+ and am trying to print to Old Imagewriter I. All I get is garbage from all applications. My dealer told me to switch XON/Xoff DIP, ... didn't work. Someone said there was a version 2.2 of the printer driver. Dealer knew nothing. Does it exist, and if so, could it be uploaded to Comp Serve so we could download it?*

**A.** Yes, we will make it available for downloading, but its now available at your dealer. However, that's not your problem. It's more likely that you've got a baud rate mismatch. The printer needs to be set to 9600 baud by the dip switches.

**Q.** *(Jon Hardis) Having had the experience with the Lisa, do you think that you can successfully market another machine costing more than \$8000? Having raised the specter of the "Open Mac" when can it be described or demoed?*

**A.** (Apple Team) Jean-Louis Gasee here (JLG for short). First we have not raised the specter, but hope to raise the spect. Now, as far as price is concerned you should not worry, just see your accountant before April 15th. Seriously, price is not the issue, it's the value that you want to secure inside any given price envelope. Not being the VP in charge of pre-announcements I won't speculate on dates. Not in 1986 though.

**Q.** *(MarkZ 512+) I have a need to write a printer driver for a PLUS. Where do I get detailed info on this. (Steve Jobs) Goodnight JLGee see you in the marketplace in '87.*

**A.** (Apple Team) The best source of info on writing printing drivers is the source to the Imagewriter driver, which is available from Apple's Software Licensing Dept. Call (408) 973-4667 for info.

**Q.** *(Dan Horn) With the current trend towards laptops and portables do you think the Alan Kay Clipboard system could exist in the near future? And what of this hands free interface?*

**A.** (Apple Team) Jean-Louis Gasee here. You must allude to Alan's dream, the Dynabook. The Clipboard can currently be found under the Apple menu ... sorry, the Edit menu. Now we need better batteries (less grams, sorry, ounces per watt/h), better flat-panel display technology, and a wireless mouse replacement. We have a few things going for us: besides the Mac user interface we can build on, we have nice 3.5 inch drives and will develop their ability to serve in rugged environments. Now, I'd like to be sitting under a tree

and be connected to Compuserve thru a cellular modem . . . Someday.

**Q. (Steven Locke)** *Developer relations used to be so supportive. Recently things have deteriorated and it took 10 Boston—CA phone calls to get an RMA to return something. Has there been a reorganization of the dept.?*

**A.** Guy here. I recently acquired Developer Relations from Corp. We had a short break in service. What can I say? Now order entry is at the support sites to speed order entry. You should write or call the support sites to get your answers. There are two sites: Sunnyvale and Boston. Did you ever get any support from IBM as a developer?

**Q. (MacDunc)** *I am the Software Librarian for the University of Texas Mac Users Group. My members would like to know when, (if ever), we can expect 68020 processors, co-processors, and a full. . .*

**A.** JLG here. I guess the missing part of the question meant full-page screen. 68020: Levco is selling an interesting 020 board. . . As far as larger screens are concerned we understand the need and will cater to it some time in the future. Sorry about the trite answer, but we're listening even if we're not pre-announcing.

**Q. (Mike Pease)** *This is a two fold question. Can you tell us when the Apple IIX will be released in 1986 and how will the new computer be different from the Apple IIe?*

**A.** JLG here: How do I put it nicely? I can't discuss it, you will cuss. Save some money though.

**Q. (Amy Grossman)** *Does Apple plan to enter the color computer business in the way that Atari and Commodore have recently done?*

**A. (Apple Team)** JLG here: 1. NO!!!  
2. I like my job, so we'll do it right!

**Q. (Marcel Rivard)** *I'm with MacDunc, Maybe one of these ... "I'm Listening but not pre-announcing" systems will lie smack dab in the middle of the engineering workstation market???*

**A. (Apple Team)** JLG here. How do we show engineers jumping off cliffs? No we won't do that again, promise. Certainly not with engineers, maybe GAP II programmers. Anyway, a lot of the compact Macintosh we sell today are going into scientific/engineering appli-

cations, so no reason to hope for less with other Macs.

**Q. (Shawn Quick)** *Two part question: (1) is there or will there ever be a Multi tasking finder that Andy H. is working on; (2) will the new MDS system support the .REL file format that MacTutor magazine is stressing, or will we be back to square one with a new format???*

**A. (Apple Team)** We've had a great time with Switcher and will be very receptive to anything that Andy can do to provide multitasking capability on the Mac. The new Macintosh Programmer's Workshop will not support the current MDS format because of limitations in that..format. We can improve link time dramatically by doing different things. We really want ultimate performance with the new system and don't feel that link file compatibility is worth compromising our design. The new MPW link file format is already public for language developers. Write to me and I'll get it to you.

**Q. (Ari S.-ISRAEL)** *new products for development and beta testing? The first Mac+ arrived Feb, 1 1986??*

**A. (Apple Team)** If you are a software/hardware developer you. . . need to get the mind share of the local Apple Macintosh Apple Office. If you have a US office, you could work directly with the Cupertino team from your US office. By the way, Feb 1st was the date that Mac+ was first shipped worldwide (yes, even the US). Mazel Tov. . . Dan (goy). (1,Ari S.-ISRAEL) Thanks and shalom.

**Q. (Francois Du Perron)** *We hear rumours about Mac co pro board and also ms dos co pro for the IIe. Any comments on that? Merci a toute la gang.*

**A. (Apple Team)** JLG here. I've always liked co-processor boards since my early Apple days when I got my initiation to PIP with a Softcard.

**Q. (RICK ESCHER)** *Apple two questions. First, do you know of any implementations of ADA for the Mac? Also when can we expect to be able to spool to the LaserWriter?*

**A. (Apple Team)** I have talked to the people at Alsys, the inventors of ADA. Their compiler runs on a sun, but is a 4Meg Byte program. They will do it for the Mac when we have enough Memory: 4 Meg MacPlus or Better. We have had a series of Engineer/Developer meetings at Apple to agree on a spooling strategy.

I think we are getting closer. There will be spec published (Prelim) within 2 months. Sidhu (from Apple) led the meetings.

**Q. (LimaPeru/Lakatos)** *Speaking as an educator at the American School down here, when will a version of Apple Talk with server especially designed for schools using? Saludos y gracias.*

**A. (Apple Team)** I missed the next to last line but I think I got the gist of it. We will market late 1986 in the US market an AppleTalk based Apple II server and cards. Price and detailed features not finalized at this time. The goal is to continue to extend AppleTalk implementations with Apple II and Mac hardware and protocols.

**Q. (Rico Vaccaro)** *Can an individual purchase foreign Macs in any country?*

**A. (Apple Team)** No, we only sell localized units in each country. Logistics is the hard part dealers couldn't cope with too many line items.

**Q. (Linda Custer)** *Questions: Will Apple ever manage to get out a Mac system that works? Will we ever be able to put more than 15 DAs in our Apple menu?*

**A. (Apple Team)** and speaking of our code, if you're talking about our System file, 3.1 is available now and 3.2 not before May. We promise to stop thrashing, honest. As for feature improvements, some of those limitations are architectural, sorry, to change them would make apps and DAs stop working. We value your software investment and don't want to make it break.

**Q. (Keith Horton)** *On the 3.5 Unidisk bug mentioned earlier I missed what the bug was.?? As a recent acquirer of a 3.5, I like it, but need to know of any problems.*

**A. (Apple Team)** Pete here. This has been covered pretty well on Maug. In short, the write function does not work properly. It will write to a protected disk. Check the ongoing thread in Apple II Maug. Either way it has been fixed, you do want to get it. Send Email to Pete Mc Donald 76703,3030. As soon as I know more I will tell.

**Q. (Donald Brown[STAFF])** *Given the seriousness of the Mac System 3.0 bug, any possibility of reconsidering getting 3.1.1 up on Macus?*

**A. (Apple Team)** Chris (victim) here. We're working on the following. . .

System 3.2 Finder 5.3  
 LaserWriter/Laser Prep 3.1  
 ImageWriter/AppleTalk  
 ImageWriter 2.3 new Chooser  
 (bug fixes)

All these are bug fixes to System 3.0/Finder 5.0-class problems. No new features have been introduced. We plan to have the new software done, but not before May. It's out to *selected developers* (a number under 10) to find the last few bugs. We want to stop thrashing, and don't want to put 3.1.1 out on anything until 3.2 is ready. Developers: If you must ship now, use 3.1.1, but don't ship the Installer. If you can wait out the month, do so. Trust me. Chris

**Q. (John MacVeigh)** Are monthly Mac+ sales significantly better than previous 512K monthly sales, and if so what do you think caused the sudden increase? (No need for specific numbers)

**A. (Apple Team)** What caused it was:  
 a) we didn't preannounce it.  
 b) we delivered what we intended to deliver.

c) we introduced worldwide on one day.

You judge how good the product is.

**Q. (Iler)** How important does Apple consider online services to the development of the home PC market (any plans to get directly involved like Commodore did giving away modems and QuantumLink?)

**A. (Apple Team)** JLG here. I trust our presence here to testify to our belief in the importance of on-line. Now as to planning to "give away" modems, I don't know of any such project. Maybe you want to ask Compuserve if they want to give a modem with the subscription.

**Q. (PEABO)** What's the juiciest tidbit of gossip you can let loose tonight?

**A. (Apple Team)** I am in love with John Dvorak.

**Q. (M Fischer)** I wouldn't dream of asking you to pre-announce a product, but would you tell us when we can expect (1) next major Apple II hardware product?

and (2) next major Mac product without telling us what it is?

**A. (Apple Team)** JLG: Moving right along. What would you think of us if we would tell you anything like that? But all rumors are true!

**Q. (PAR)** Does Apple expect to develop any SCSI peripherals esp. Hard disk drives. And do you have any experience with any current examples???

**A. (Apple Team)** It makes sense that we would, but remember we also have a half million Mac owners who don't have SCSI ports. As for third-party SCSI drives, we know of Micah, SuperMac's Data Frame, and HD20 from MDIdeas. All are impressive, fast, and inexpensive. There's also the biggie, the AST 70MB, if you need tremendous speed and capacity.

**Q. (Michael L. (//er))** The Apple // community feels abandoned by Apple. Will Apple ever do anything to correct this? I don't want to hear about Sun Data; that was a cop-out. At this point, I'd say that the very least Apple could do is to release a lot of copyrighted ///

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CIRCLE 85 READER SERVICE CARD

code into the public domain (like the SOS source code?).

**A.** (Apple Team) JLG: Your feelings are not new to me. That does not mean we can't do anything. The request to make A/// code to public domain is new (at least to yours truly here). I have to investigate that one. Sorry I can't be more precise.

**Q.** (Pat Phelan) I am a developer for a mid-sized accounting firm. We have a fairly large number of ///s that we use for strictly internal purposes. We got excellent support from our Apple reps when we were starting to develop, but can no longer get anything at all. We have had a second dealer come to the rescue providing a great deal more support than we had any reason to expect, but no support from Apple itself after the first dealer dropped the ball. As another problem, we started to investigate a change from the /// to the Mac, and were politely told where we could go if the software was not intended to be marketed.

**A.** (Apple Team) There is excellent support on MAUG for Apple ///. Our Developers are intended for commercial developers, this is correct. I still think that it would be a good idea to move to

the Mac. We have good Pascal, BASIC, and Cobol on the Mac. By the way, everybody should try LightSpeed C from Think Technologies. It compiles about 200 lines per second !!!

**Q.** (Tom Mackie/PMUG) You've been very precise about not using System 3.0 and what is to come in May, but can't we be as precise about what combo of Sys/Finder to use now? e.g. 3.1 or 3.1.1/.5.1 or 5.2 etc.

**A.** (Apple Team) Chris here. The problem is that each System file has problems. You get to pick which problem you want. 3.0 has an UpdateResFile bug that trashes files. 3.1 is better, it fixes that problem, but it locks Pack 6, which causes many applications to crash because of a fragmented heap. 3.1.1 fixes that, but it won't work with the Installer and its scripts. All these problems were caused by our knee-jerk reaction to fixing bugs without testing extensively first. That's why we're waiting a good long time to release 3.2, which will be supposedly free of all known bugs. As for the Finder, 5.2 is the best. There are a few problems with the Trash Can.

**Q.** (bdial) 1. Could you comment on Lisa support, (workshop and 7/7)? I am a software engineer & I think that

apple is missing the boat if they do not offer direct assistance to companys doing private development.

**A.** (Apple Team) Dan here. 1. The Lisa Workshop is still one of the premier environments for developing Macintosh software. We'll continue to support (but probably not revise) that product for those who wish to continue using it. All the functionality, power, and features of the Workshop will be available in the forthcoming Macintosh Programmer's Workshop (and more). This product is in alpha test to a limited group and the response has been great. Lisa 7/7 will not see any more revisions. 2. If you are developing software products, either for commercial, OEM, or vertical markets, and have the wherewithal to do so, you too can be a Certified Developer. Or you can send a wedding present to Guy Kawasaki. We don't harbor any Elitism when it comes to development, nor do we have a monopoly on technical expertise. When it comes to developer support, MAUG's MacDev and Apple II SIG's are one of the best places to be.

**Q.** (Darko) When will HFS MacWorks be available? I'd like to register my vote for a large screen Mac. And when will the products mentioned in April "Outside Apple" be shipping?

**A.** (Apple Team) Chris here. The cellular mobile 4MNb flat-screen color Mac is available now. Solar option coming real soon now. We're working with 7-11 for a retail deal. Seriously, as I pre-announced the MacWorks HFS upgrade, I get to unannounce it. The Macintosh XL trade-in program has pre-empted any further development work on MacWorks, save fixes of critical bugs. MPW works fine on a large MFS volume, so we're not planning to port the MacPlus ROM to MacWorks. Sorry.

**Q.** (Richard Ewing) (1) Is Apple working with any Optical disk, CD-ROM or CD-I tech; (2) Can you elaborate on the smalltalk product due RSN?

**A.** (Apple Team) (1) You bet we are working on CD-ROMs. They will be on the SCSI port (standard or optional on all our future computers). (2) SmallTalk is available now, see Software Supplement on MacDev.

Please let us know your opinions about this teleconference and any suggestions for future such interchanges. We shall pass on your questions, suggestions to Apple, Inc. (eds).

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# AST - 4000 REVIEW

**Product Name:** AST-4000  
includes drive w/built in tape unit, Mac SCSI cable, SCSI terminator, disk with installation and utilities software and one blank tape.)

**Hardware**

**Requirements:** Macintosh plus

**Software**

**Requirements:** System 3.1 and Finder 5.2

**Manufacturer:** AST Research inc.  
2121 E. Alton Avenue  
Irvine Ca. 92714  
714476-3866

**Support:** Included

**Price:** \$6995.00

## JIM SADLER

I like MASSive amounts of STORAGE. This product should be able to satisfy just about anyone's requirement for data storage. A single unit may store up to 74 Megabytes of data, with expansion chassis's that number increases to 370. With its built in streaming tape drive, backup problems are taken care of also.

### Specifications

The following information is from the manual. The disk is 5.5" high, 14.5" wide and 17.1" long. It weighs 32.5 lbs so I don't think you will be lugging it along with your Mac. The data transfer rate is 5 Mbits/sec, although It will never reach that rate as the Mac is not capable of it. Error Detection/ Correction for the disk is 32 bit ECC(Err Checking and Correction), 8 bit correction. The backup tape uses read after write, 16 bit CRC (Cyclic Redundancy Check). It uses the SCSI (Small Computer System Interface) interface as defined by ANSI (American National Standards Institute) X3T9.2 rev. 14. Disk error rates are, soft errors less than 10 in 1011 bits, hard errors less than 10 in 1013 bits and seek errors less than 10 in 107 seeks.

### Setup

The AST-4000 comes with a installation disk, a SCSI cable made for the Mac's non-standard connector and a SCSI terminator which is required for the first and last devices of a SCSI daisy chain. Usually when I get a new "toy" I start using it and read the manual later. This time, because of the price and the fact that it is a *big* disk, I read the manual first. It is clear and easy to understand. I found one error and have one suggestion. The error is on page 20 paragraph 4.3, "If the HD

20 is connected to the the external floppy port, it is not possible to boot from the AST-4000." Not true if you remove the System and Finder files it will boot from the AST-4000. My suggestion for the manual is to move figure 2-2 to the previous page where the connection instructions start so that you would see what you are trying to accomplish before you start hooking up cables. After the hardware is hooked up, you run the install program from the disk. This program formats and writes the directory and SCSI driver to the AST-4000. You also use this program to let the Mac know that the drive is there if you didn't boot off of it and to test the drive's interface. The first time I tried to install it I ran across a bug in the program, I'll explain this later.

### Things To Be Aware Of:

**SCSI addresses:** The SCSI is only capable of addressing 8 devices. The Mac uses one of these (address 7). The tape drive another(address 4) the base unit one (address 1). If you have the two expansion units, use two (addresses 1 and 2). If you use all of these, you only have room to daisy chain three more devices on the SCSI port. Most places I think would only have the base unit, allowing five devices to be daisy chained. This drive is not quiet, it will probably be the noisiest device of your system. The addresses on the drive are not changeable.

### The Bug

There was a bug in the first version of the software that I received. As soon as I called AST and told them about the problem they knew what it was and sent a new version via air freight. At the time they did not know that I was reviewing the drive, so I assume that they treat all their customers that way. Too bad the software companies aren't as responsive for their bug's.

If you Initialized or re-formatted the drive after the first time, the initialize and format routines would hang up the system. The mouse was still active, but nothing else would work. The bug manifested itself in the following manner; Boot from the installation disk and select re-format. A dialog box would come up and warn you that you are about to format the disk. A cancel button, the default selection, and an okay button are the choices. Clicking on the okay would bring up a dialog box telling you that this would take a few minutes. After the formatting is complete, the box is erased and the system would hang. A simple solution involves pressing reset and when the install program presents its selections, click on "initialize." You will be prompted for a name, and the drive, and it will initialize the drive and you're in business! I called the factory and they knew immediately of the problem and said that a few of the drives had been shipped with the version 1.0 install program. As soon as each owner called and identified the problem, they would air freight a new version, 1.01, of the software for delivery the next day. After I received the new version, it worked without any problems. Not bad service in my opinion, I wish other companies were this good.

### Use

As with any disk drive you should not be aware that you are "Using" it, it should just do it's job. The only thing I noticed about it was the speed, about twice as fast as the HD 20. My general impressions are that the unit is fast, easy to use, and set up. It survived a thunder and lighting storm that knocked out power for about 10 seconds and I was not able to turn it off before power was restored. It didn't bother it, half as much as it bothered me. Other tortures that I have subjected it too include; pressing the reset button during volume recovery. The drive booted with no problems, it didn't seem to cause any problems. If the drive loses power during backup, it looks as if it tries to continue the backup but it sounds as if the tapes just search back and forth. Pressing reset to reboot brings it up without any readily apparent problems. Needless to say I don't recommend that you try any of these types of "torture" tests, but if you are curious, those were my experiences. One thing I noticed is that the "Limited Warranty" is for 180 days, this is twice as long as many others I've seen.

### Tape Backup

A dearly needed feature on any drive of this size is a backup method. The AST-4000 comes with a built in tape drive. Each tape holds 60 Mbytes. A backup program is included on the installation disk. It's use is straightforward and easy. It offers two kinds of backups; file and volume.

File will selectively back up the files that you choose. It can not back up folders, you have to select all of the files you want to backup. It then copies them to the tape with a time stamp. This allows multiple copies of the same files on one tape. You can selectively retrieve the files, but not delete them. It sure would be nice to be able to copy by folders, this would save a lot of selecting individual files.(hint hint)

Volume backup is also known as Mirror or Image. What it does is copy exactly what is on the disk and write it on the tape, in effect it writes an image of the disk to the tape. This means sectors that were marked as bad and spared, the sequence that the files appeared on the disk etc. If you use this method, you have to recover the data on the tape back to the same disk that it was copied from. This is the method that is normally used when you backup the drive. It takes two tapes and almost 30 minutes for one drive. The tapes cost about \$30.00 to \$40.00

each, so they are not cheap. Volume recovery with the tape takes about 2 hours and 40 minutes. I don't think you want to do this very often and if you had all of the expansion units, you would be doing recovery for 13 and half hours!!!

### Timing Information

It is difficult to get meaningful timing information. It seems that even if you copy the entire contents of a HD 20 or floppy to the AST-4000, the amount of data displayed on the GET INFO box is different on the different drives. The data used in the tables are programs and associated date files which I have accumulated since November on the HD 20. I thought that this would be a good mix of what most other people would have. In light of this I still hope that the following table will be of some help.

### Notes:

1. Same set of files, don't know why it changes sizes.
2. Copy by duplicating.
3. Formatting and initialize.

*General notes: Time is in minutes:seconds + 1 second, disk cache is off, Finder is 5.2, System is 3.1.1, the floppy disc and HD 20 drives are from Apple.*



TABLE 1

Timing	Data in bytes	Direction	Operation performed
0:52	800,000		initializing 800k floppy
5:25	73,353,000		initializing AST-4000 <sup>3</sup>
			initializing HD 20
0:12	791,040	Floppy	booting from shutdown
0:16	791,040	floppy	booting from power off
0:14	11,404,800	HD 20	booting from shutdown
0:33	11,404,800	HD 20	booting from power off
0:09	11,707,248	AST-4000	booting from shutdown
0:15	11,707,248	AST-4000	booting from power off
14:25	11,133,952	HD 20 to AST-4000	Copy
8:00	11,133,952	AST-4000 to AST-4000	Copy
1:56	733,696	floppy to floppy <sup>1</sup>	Copy
0:44	733,696	floppy to AST <sup>1</sup>	Copy
0:22	734,208	AST-4000 to AST-4000 <sup>1,2</sup>	Copy
1:18	727,040	floppy to HD 20 <sup>1</sup>	Copy
1:08	727,040	HD 20 to HD 20 <sup>1,2</sup>	Copy
0:10		AST-4000	Launch MacWrite from a document.
0:06		AST-4000	Launch MacWrite.
0:09		AST-4000	Quitting MacWrite with a document.
0:08		AST-4000	Quitting MacWrite.
0:11		AST-4000	Launch MacDraw from a document.
0:10		AST-4000	Launch MacDraw.
0:08		AST-4000	Quitting MacDraw with a document.
0:07		AST-4000	Quitting MacDraw.
0:05		AST-4000	Launch MacPaint from a document.
0:04		AST-4000	Launch MacPaint.
0:08		AST-4000	Quitting MacPaint with a document.
0:08		AST-4000	Quitting MacPaint.
0:13		HD 20	Launch MacWrite from a document.
0:10		HD 20	Launch MacWrite.
0:11		HD 20	Quitting MacWrite with a document.
0:11		HD 20	Quitting MacWrite.
0:17		HD 20	Launch MacDraw from a document.
0:14		HD 20	Launch MacDraw.
0:11		HD 20	Quitting MacDraw with a document.
0:11		HD 20	quitting MacDraw.
0:06		HD 20	Launch MacPaint from a document.
0:05		HD 20	Launch MacPaint.
0:11		HD 20	quitting MacPaint with a document.
0:11		HD 20	quitting MacPaint.
0:13		Floppy	Launch MacWrite from a document.
0:11		floppy	Launch MacWrite.
0:08		floppy	quitting MacWrite with a document.
0:08		floppy	quitting MacWrite.
0:22		floppy	Launch MacDraw from a document.
0:18		floppy	Launch MacDraw.
0:11		floppy	quitting MacDraw with a document.
0:07		floppy	quitting MacDraw.
0:09		floppy	Launch MacPaint from a document.
0:07		floppy	Launch MacPaint.
0:07		floppy	quitting MacPaint with a document.
0:07		floppy	quitting MacPaint.

# Microsoft FORTRAN Review

## Thom Mayer

I can think of three main reasons you might want a FORTRAN compiler for the Macintosh: (1)porting an existing FORTRAN application to the Mac (2)developing and testing FORTRAN code which will eventually run on other machines (3)programming on the Mac for the Mac.

I am interested in the first two features. I have existing FORTRAN-77 programs on a Vax and thought it might be useful to download the program to my Mac-XL. Then I could make future changes with my nice Mac editor, and use a Mac based FORTRAN compiler and linker to test the changes, finally uploading the debugged changes back to the Vax or any other target machine which supports FORTRAN-77.

My style of FORTRAN programming centers around creating packages of related subroutines which can be compiled separately. Typically there will also be an **include file** associated with this package containing a named common block declaration. Any program which needs these functions would have to include this common block header and be linked to the package of subroutines. This approach has the advantage that once a package is complete and tested then future programs can access these capabilities with ease.

The Microsoft FORTRAN compiler (version 2.1) has a number of excellent features including: (1)it supports full FORTRAN-77 (2)it includes a linker (3)it has a library manager (4)it uses a window oriented symbolic debugger.

Now, after spending several hundred hours with this compiler, I have discovered a number of limitations that make it less than a joy to use. The difficulties seem to fall into eight major areas:

### #1: A bug related to using the default name for the linker output.

I began by downloading my Vax source code and it compiled with few modifications (I specifically avoided using any

of the non-standard FORTRAN extensions available in Vax FORTRAN for just this reason). But when it came to linking, strange things began to happen. The linker began rejecting my files, claiming an error due to "multiple entry name in file." This was a mystery to me, as the same files compile and link just fine on both the Vax and on an IBM-PC running Microsoft FORTRAN. After a lot of wasted time, I discovered that the bug happens when you let the linker use the default name for the output file, which is the same name the compiler gives its output. If you have linked it once, the file is poisoned and won't link again, even if you go back and recompile the original file. It is easy to avoid this bug: simply don't use the default output filename and rather use the linker option for specifying the name of the output file. This wouldn't be so bad, except the debugger only works when the name of the source is the same as the name of the application. So basically you can either use the linker or the debugger, but not both.

### #2: Included files can't include other files.

Before discovering the solution to this bug, I thought I'd just use the include command to append my subroutines to the main program and sidestep the linker, but no such luck. In the Microsoft compiler, include files can't include other files, and the subroutines in each package used the include command to load the common block header (one does this to avoid making the same change dozens of times in your source code). I can't see how Microsoft could justify this limitation as it is a definite handicap.

Grumbling, but not daunted, I expanded the include statements by hand. The program compiled fine. With that I figured luck was on my side and decided to go right into trying out the debugger.

Using the symbolic debugger is relatively easy. First of all, you are presented with a standard file window from which you select the file you want to debug. The debugger loads in the file, sets up it's windows, and you're off. But in my case, after

selecting my newly compiled file, the debugger dumped me directly back to the finder (or minifinder or switcher, depending on how you have your machine set up) without any indication as to what was wrong. After repeating the same performance a few times, I tried running the application without the debugger and I was rewarded with an error message telling me the heap wasn't large enough to run my program.

### #3: Application heap size must be set manually, and insufficient heap size brings down the debugger without even an error message.

As it turns out, you must use the linker to change the heap size if the default is not large enough. Perhaps it's unreasonable for me to expect this to be automatic, but I never had to do it on the Vax. (is three too few, is six too many?) In any case, the debugger sure didn't give any indication, short of dumping me back to the operating system. Since I was going to have to use the linker anyway for setting the heap size, I figured I'd write some small test programs and files of small test subroutines and try to make peace with the linker and debugger, suffering in the process a not insignificant increase in blood pressure.

### #4: Occasionally the linker and debugger send you back to the operating system without any choice.

For example, when using the linker, if you incorrectly specify one of the files to link, the linker will inform you of your error and wait for a return before unequivocally dumping you back into the finder. No second chances here. Although there are probably some operating systems (especially ones which support batch files) where this behavior makes sense, it is inappropriate on the Mac, and especially irri-

tating when you are using the switcher. A similar irritation exists with the debugger. Error messages, for example, dump you right back to the operating system.

### #5: Restarting a program under the debugger is somewhat clumsy.

I don't know how everyone else uses a debugger, but I frequently want to rerun the program. The debugger does not have this ability, although you can start another program from within the debugger. Thus, if you want to restart the program that you are debugging, you must select the transfer menu option, select the debugger as the program to transfer to, select the file to be debugged from the debugger's file menu and at last, you have restarted. A little too much effort for such a common task if you ask me.

### #6: Transfer capabilities are only partially supported.


The transfer option, with which one can start another program without returning to the finder, is available in the debugger and the compiler. However, the linker has no transfer option and the editor, although it has a transfer option, does not allow you to transfer to the compiler, linker, or debugger. This slows down the normal edit-compile-link-debug cycle.

### #7: Case sensitivity is handled poorly in the debugger and linker.

The compiler gives you the option of having all symbols (e.g. variable names) converted to uppercase. Standard FORTRAN-77 is not sensitive to case, but I guess people who intend to link with case-sensitive languages, like C, need the option. Since the Vax compiler ignores case, I chose the convert-to-upper-case option. The debugger, however, is case sensitive, so if you want to observe a variable and type in the name in lower case, it can't find it, since the symbol table is all in upper case. Consequently you find yourself with the caps lock button on, which would be no big deal, except the linker doesn't understand upper case commands, only lower case (hard to believe, but true). Consequently 50% of the time you have the wrong case.

### #8: Compiler does not automatically distinguish between subprogram compilation and main program compilation and there is no way to indicate it in your source file.


A similar situation of being wrong 50% of the time occurs because the compiler does not, like the Vax compiler, automatically discern between subprogram compilation and main program compilation. Instead, there is a compile time option you must select to set which type of compilation you are doing. This becomes a nuisance if you, like me, are constantly switching back and forth between the main program and the package of subroutines. The compiler does have an OPTION command that you can include in the source file to set certain compile time options, but this specific compile time option can't be set in such a manner.

It would be incorrect to come away from this review with a totally negative opinion of the Microsoft Macintosh FORTRAN compiler. It is quite fast, equaling our Vax when it has 7 users, and it works pretty well within the Mac environment. The basics are all there, it just needs a little polish. Given Microsoft's practice of improving existing products and offering upgrades for around 25% of the price of the new product, it would not be unreasonable to purchase this product now if your need is immediate, otherwise I'd wait for the next release. 



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# Interlace Review

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<b>Publisher:</b>	Singular Software 5888 Castano Drive San Jose, CA 95129 1-800-626-8392
<b>Type of Program:</b>	Relational database w/spread-sheet features
<b>System Requirements:</b>	512K Macintosh (or larger), 2nd disk drive
<b>Copy Protection:</b>	Yes
<b>Price:</b>	\$139 (very good buy) 60 day money back guarantee

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## Dennis Collier

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In the past few months I've read that many developers of Macintosh software, particularly those involved with business applications, have decided to abandon the Macintosh altogether or no longer write exclusively for Apple's "insanely great" machine. The reason given most often is that sales have not been nearly as high as expected when one considers the potential market several hundred thousand Macs represent. Why should this be so? One might point with some justification at illegal copying of original software. Certainly pirating has contributed to the sales slump to some extent, but perhaps the accusing finger is being pointed too quickly. Could it be that *overly high software prices* are actually the problem? How often have we seen a new piece of software that we'd like to own only to be put off by its price tag?

### A Database Bargain

The going retail price for a typical hierarchical Mac database is \$195. If we desire the added power of a relational database, toss in another fifty dollars at least! Many of us cannot justify that type of expense, especially when we consider the original (that is to say, rather high) outlay for the Macintosh itself. We all too often find ourselves doing without the software package. I'm very pleased to mention that Singular Software of San Jose, CA has done something about this problem. Not only has the company produced a well designed and powerful relational database program, **Interlace**, but it retails for only \$139! Although no software package will completely answer every user's need, this one comes close.

The Interlace package comes with a 327-page manual and two disks. One contains the Interlace application, two files to be used when following the tutorial outlined in the manual, and a number of other sample files. The other is labeled *Examples*, containing database and report templates for such uses as Client Billing, Income Taxes, and Checkbook Balancing, as well as the remaining files to be used with the tutorial and a rather large (100K) and particularly useful file for on-

line help. No backup disk for the application is included, and unfortunately Interlace is copy-protected. However, "backups" can be made using the Finder, with the slightly troublesome requirement that a backup be validated every 14 days by inserting the original disk. At least this way Interlace can be copied to a hard disk, which is almost a necessity if any large databases are planned.

## The Manual

As for the manual, I found it for the most part to be well written and informative, although I did encounter a few typos. It is divided into four sections: *Single Files*, including reports; *Multiple Files*, depicting methods for linking more than one database together and generating reports; *Details and Techniques* and *Reference*. The tutorial runs through the first two sections. Throughout the manual there are many helpful diagrams of what one should expect to see when using the program. One minor complaint I do have concerns the manual's binding; I'd prefer that the large number of pages be spiral-bound rather than glued. I had trouble keeping the manual open while following the tutorial, short of setting some heavy object down on it, and through prolonged use of the documentation the pages will almost certainly fall out. The index is fairly well cross-referenced, although I did learn with a little digging that some items had been left out of the index entirely and had to be located in the reference section.

## Macintosh Standard Maintained

Interlace receives five stars for strictly following the standard Macintosh interface. I find it comforting when using a Mac application for the first time that it behaves in the expected way, i.e., the Tab key moves the cursor from field to field, the Return (or Enter) key signifies acceptance, etc. Macintosh users are somewhat spoiled in this respect relative to other machines and operating systems. We know that there is enough new information to learn about an application itself without being worried about some oddity in the way the program operates outside the Mac standard, and we don't want to be bothered with extra details. Interlace frees us of this concern.

Certainly with Interlace goes a new learning experience. I doubt anyone trying to use the program for the first time without access to the manual would get very far, even though the program is very user friendly within the context of the interface. There are just too many features unique to the program, but once the user has mastered them he's in business.

I therefore began testing Interlace by following the manual's tutorial and quickly discovered that using the program can be fun, if one can describe using a database as fun. Data entry is very easy and straightforward, but rather than relating the procedure for entering a new database, I think it's more appropriate to focus on Interlace's features. Interlace can do just about anything we might want a database to do. With it we can query records to find information that meets very specific needs, such as how many Texas counties have population totals between 10,000 and 100,000 and at the same time have a mean household income of less than \$20,000 per year. If the database contains information concerning individual incomes, Interlace can count the number, average them, then provide the county average. Interlace allows us to search or sort any of its seven distinct data types: text, number, integer, date, time, logical, and sequence (picture fields are not covered, as in Microsoft File). We could therefore sort these counties according to population or yearly

income, for example, then report the findings. In the case of records containing date information, we could specify, for instance, that Interlace show us only those files from March 10 to April 16.

In many respects Interlace, because of its spreadsheet-like abilities, reminds me of Microsoft's Multiplan. Both programs can calculate user-specified data by employing both mathematical and logical techniques. Key words such as AND, OR, TRUE, FALSE, SUM, AVERAGE, MAX, and MIN are included to allow the user to combine different types of data to his advantage. Interlace doesn't stop here, however.

## Linking Databases

Perhaps the feature which separates Interlace from its competition (unless one has a lot more money to spend) is its ability to link one database with others. Records in one database file can be associated with those in another by what the authors call a *collection of links*. First each file is given a new "field" which creates the appropriate *link*. A line is then literally drawn from one file to the other so that these links are connected to establish the relationship between the files. We can see the link right on the screen. After the link has been completed, we can use the information in each of the files. If we update one of the files, the other can be properly affected at the same time. Not only that, but should we add a new record to a file, its linked file will be accessed immediately to include the change.

As for reports, we can generate them in a variety of ways. A default option can be used to produce a standard tabular report, but we can also design our own format. Interlace uses a setup scheme reminiscent of MacDraw. A grid is used together with boxes of variable size to create the design format. Labels can be entered in any of the available System fonts and sizes and positioned along with the field boxes. Any of Interlace's sort and specification features I mentioned earlier can be used to generate tailor made reports. If the design is not to the user's liking, it can be redone at any time, including where each field is located on the page and its size. My only complaint, and it is minor, is that I wish that a field size could be specified by character length. That way, if I knew the maximum length of a record for a particular field, I could set up the size of the box in the beginning. As it is, Interlace forces me to experiment with field lengths by resizing boxes until I'm satisfied.

Information not in the form of reports can be imported/exported in one of three ways: via the Clipboard, as a text file, or in a mail merge format. I wondered how easily Interlace would allow data transfer from another database. After all, if we change databases, we don't want to re-enter all of our old files. To test this, I saved to the Clipboard a rather large OverVUE file (432 records). I used the Clipboard because I couldn't determine how to save an OverVUE file as a text file. After specifying the names of the various fields to Interlace, I was pleasantly surprised to find that all data was transferred perfectly. The user should keep in mind that the space on the Clipboard is limited due to RAM size; if all of a file cannot be transferred at once, divide it into parts and transfer each part one at a time.

All in all I *definitely* recommend Interlace, especially if the user requires a relational database that also serves as a good report generator. Not only is it a powerful program employing many useful features, but it is worth the purchase price.

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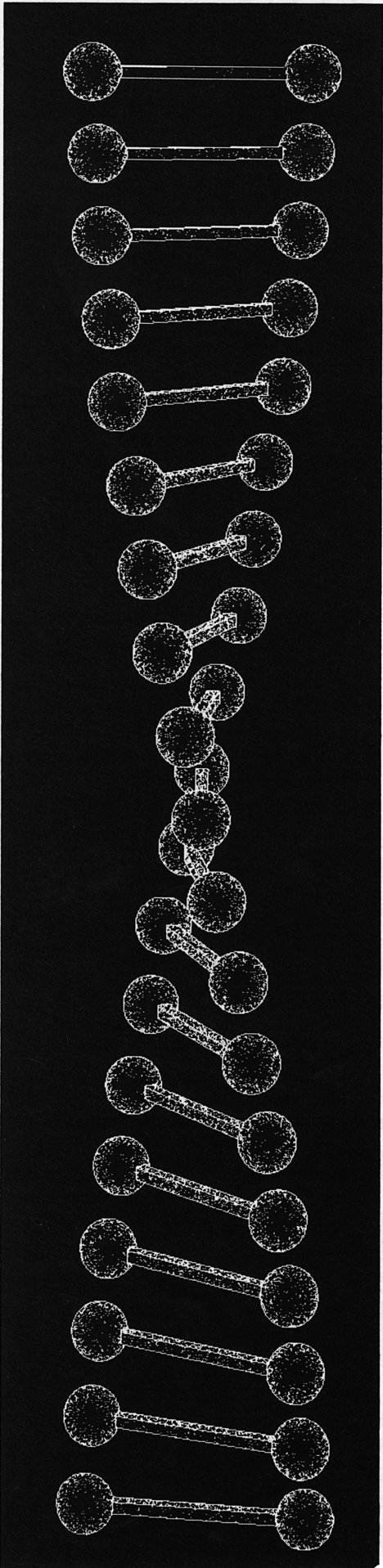
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# Silicon Intelligence

**Michael & Lisa Storrie-Lombardi**

Last month we said we'd take look at:

1. Knowledge representation in an expert system, and
2. Identifying expert system boundaries.

For starters let's look at four central definitions.

**Knowledge engineering:**

The process of transferring human information into computer programs.

**Knowledge base:**

The data as well as the rules about or examples of decisions that lie at the heart of an expert system.

**Inference Engine:**

Programs analyzing the knowledge base and pinpointing which decision rules have been used to solve a particular problem in expert fashion.

**Extensibility:**

The ability to use old concepts to define new ideas and processes. For example, anyone who has played with LOGO knows that as soon as you define a procedure and make it part of your usable library it is available for use in any future program or procedure you write. What took you ten lines to describe before now only takes one word.

When a knowledge engineer begins the process of constructing an expert system, s/he first gets locked into a closet with one or more human experts in the target area. The engineer quickly runs head long into the phenomenon of the experts not knowing exactly what they know. In fact most experts have a high degree of ignorance in two areas,

1. What they consciously know.
2. How they go about the process of solving problems.

If pressed, true experts will finally relay these two pieces of information to the knowledge engineer, but they can't tell the knowledge engineer what questions s/he needs to ask them. This brings us to an exciting corollary for all of us "let's build our own expert system" folks: One of the most useful things you may gain from designing an expert system of your own may be what the process teaches you about your own expertise.

With that aside let's look at what an expert system needs to know. For openers:

1. How the individual data pieces in the knowledge base interrelate.
2. Where each piece of data fits into the larger problem-solving picture.
3. The reliability index of each piece of data.
4. What impact the chosen programming language may have on the design and limitations of the system.

Let's use the fourth element as a starting point. Remembering our long range goal in this column of gradually developing a small expert system, perhaps if we review some basic advantages and disadvantages of several popular languages, the inherent possibilities and limitations of our expert system will become more clear.

**Language Choice in AI**

A good A.I. language needs to include:

1. Complex data structures

2. Extensibility
3. Powerful string handling capacity
4. Ability to treat a program as a data structure

Here goes a list of pros and cons for BASIC, Pascal, LOGO and LISP. We shall use Prolog as a brief introduction to nonprocedural languages.

## BASIC

Con

1. Doesn't deal with lists.
2. Has no data structure comparable to lists.

Pro

1. Extremely wide availability and installed base.
2. Structured programming available in some versions of BASIC on the Macintosh.
3. With all of its limitations, as long as you stick to rule-based expert systems you can produce quite useful and powerful tools. (See our earlier references in the March issue to the books by Chris Naylor and Forsyth and Naylor using Applesoft).

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## PASCAL

Con

1. Has no lists.
2. Cannot self-modify.
3. Does not really exhibit extensibility.

Pro

1. Has required structure.
2. Handles strings well.

## LOGO

Con

1. In most versions a program cannot modify itself while it's running.
2. Usually slow.

Pro

1. Handles lists powerfully.
2. Manipulates strings well.
3. Highly extensible.
4. Widely available.
5. Easy to learn.

## LISP

Con

1. Parentheses can drive you crazy.
2. Requires large amount of memory, both RAM and disk.

Pro

1. Handles strings well.
2. Quite extensible.
3. The granddaddy for handling lists.
4. Structured.
5. Can modify itself while running.
6. A massive database of programs exists worldwide.

7. Compiled versions have acceptable speed.

As this series unfolds we shall generally use examples from ExperLISP, ExperLOGO, MacScheme, and MSBasic. If you have other languages of interest running on your Macintosh please contact us.

## PROLOG

Instead of giving you a list of facts about Prolog let's use it as a way to introduce concepts central to a nonprocedural language and as a jumping off place for the discussion of the boundaries of an expert system. The most widely available nonprocedural programming language and the language of choice for AI experimentation in the United Kingdom and France, Prolog can get us to common ground on procedural versus nonprocedural programming languages.

In the world of neuropsychology we define two concepts, crystalline intelligence and fluid intelligence. Crystalline intelligence covers all those tasks that we do many times a year (or day), usually in a fairly fixed pattern. Originally we may have had many possible solutions available but over the years we have decided that one particular procedure provides the optimal solution to a given problem. We give up flexibility for speed and reliability. Fluid intelligence includes all those activities requiring novel, creative, and experimental thought. No set, tested procedure to handle the immediate problem exists. We seem to attack the situation with a variety of associative, intuitive, random, nonprocedural strategies. We give

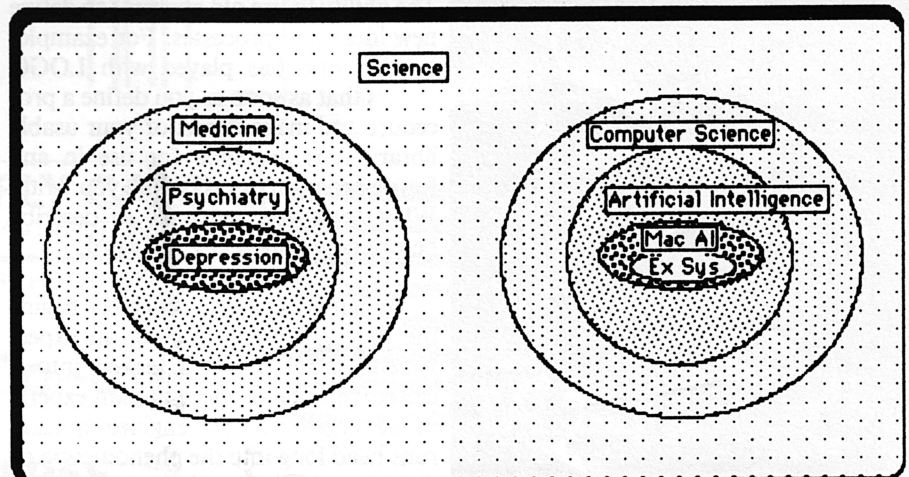


Figure 1. Domains of expertise, parallel.

up speed and security to find a best solution.

BASIC, Pascal and many dialects of LISP store information as arrays, lists, or some other data structure. Prolog stores knowledge as data and relationships. Programs written in Prolog don't exactly do anything, they describe relationships. You would try to tell the program as much as you know about the problem and possible solutions. Prolog would then use a variety of deductive strategies to come up with possible solutions. Prolog gives us a classic example of a "closed world" system. When solving a problem, Prolog looks at its knowledge base and considers everything else nonexistent. Prolog's world stops at the borders of its knowledge base. While we will not use Prolog in this column until it becomes more widely available, it does remind us of the importance of distinguishing crisply between what our expert system knows and doesn't know.

### An Expert?

When you first begin to design your expert system, you will essentially become your own knowledge engineer. You will then discover that we have three major ways of determining "who's the expert?." We can choose:

1. One clear human expert (us???)
2. Consensus from several experts.
3. Weighted views of differing experts.

A fourth exciting possibility does come to mind. You could design your system to attack each problem with multiple strategies, obtaining different recommendations from the viewpoint of several different experts. You would have programmed your expert system to emulate the database and techniques of several experts with differing opinions.

### Designing Your System

Once you have found your expert you now get a shot at defining your system's first boundary. You need to know about domains. For any of you who have suffered through set theory in high school and college math this will look very familiar. Take a look at these two examples.

#### Example 1:

If we wanted to define our expert domain in medicine we would look at medicine as a subset of all science (or art depending on how we feel), psychiatry as a subset of medicine, and major depressive disorders as a subset of psychiatry. We might then proceed to

further subsets for our expert system keyed on other factors such as socioeconomic (middle/upper-middle class America), geographic (north-western United States), etc. The subset specificity depends on such factors as time allocation for programming, memory and speed limitations of hardware, and exasperation quotient of the knowledge engineer (you).

#### Example 2:

If we wish to define our expert domain in AI, we might look at artificial intelligence as a subset of all computer sciences, Macintosh specific programming as a subset of AI, expert systems as a subset of Macintosh AI, and computer magazine education as the final straw—esoterically known as the destination domain (Figure 1).

Okay gang, between now and next month go figure out your own area of expertise, try to come up with a list of elements that mark the boundaries of your domain of expertise, and see if you can catalog the basics of your data, data relationships, and decision rules. Finally, if you really want to stay up all night, see if you can figure out even half a dozen components of your inference engine. If we can do all those things, you'll see another column here next month. Happy thinking!

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# News from Apple Computer, Inc.



## Apple Announces Rebate Programs for Educators and Students

Apple Computer announces two programs that enable both full-time teachers and college students to purchase an Apple computer through an authorized Apple dealer and receive a cash rebate directly from Apple.

Eligible participants in the programs, dubbed "An Apple for the Teacher" and "Apple's Student Break," can receive a \$75 rebate for the purchase of an Apple //c computer, \$150 for an Apple //e, \$175 for a Macintosh 512K, and \$200 for a Macintosh Plus.

"Apple's long term commitment to education includes providing individual educators and college students with the opportunity to take advantage of computer technology and all it has to offer at affordable prices" said Jim Buckley, Apple's education sales manager. "Our schools are filled with teachers who want to use computers in a professional capacity outside the school setting in areas such as lesson planning and materials development. And college students are eager to have personal computers to enhance the quality and breadth of their education."

### How to Participate

Customers can obtain brochures containing rebate certificates from their local authorized Apple dealers. To participate, customers purchase the Apple computer of choice from an authorized dealer, submit

verification from their school that they are full-time educators or full-time students, and submit a dealer endorsed rebate certificate and the original sales receipt to:

**Apple Computer, Inc.**  
P.O. Box 3984  
Beaverton, OR 97075

Rebate checks will be mailed to program participants within 6 to 8 weeks

## Apple Computer Orders Cray X-MP Supercomputer

Apple Computer, Inc. and Cray Research, Inc. announces that Apple has ordered a CRAY X-MP/48 supercomputer.

Installation of the system, which is valued at approximately \$14.5 million, will be used to simulate future hardware and software architectures and to accelerate new product development.

"In order for us to remain a technology leader in the personal computer industry, we must be willing to make significant investments in research and development," said Delbert W. Yocam, Apple's executive vice president of product operations. "With the Cray supercomputer and its powerful simulation capabilities, we will be able to evaluate a greater variety of future product directions, which will help us continue to bring revolutionary products to the marketplace."

Apple Computer designs, manufactures, and markets personal computers and related software and accessories for use in business, education and the home. Cray Research is engaged

in the design, development and manufacture of large-scale computers and the marketing and support of such systems.

## University Consortium Update

Apple Computer, Inc. announces the expansion of the Apple University Consortium (AUC) to include eight U.S. universities. Joining the AUC are Massachusetts Institute of Technology, University of California at Berkeley, University of Illinois at Champaign-Urbana, University of Maryland, Drake University, Duke University, Emory University, and Franklin and Marshall College.

The AUC, established in January 1984 in conjunction with the introduction of the Macintosh computer, brought together 24 leading universities to explore innovative uses for the Macintosh personal computer, develop courseware, share information with each other, and act as an advisory council to Apple.

Apple provides members with the opportunity to offer advice to Apple on the product needs of universities as well as with a forum for sharing ideas and developments. So far university developers have produced more than 300 software applications that will soon be available to schools and students through the Academic Courseware Exchange, a software distribution program run by Kinko's Graphics of Santa Barbara, California.

Other members of the consortium are 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 at Austin, University of Utah, University of Washington, and Yale University.

### **Lisa/Macintosh XL Trade-in Program**

Apple Computer recently announced the Lisa/Macintosh XL Trade-in Program. Since the announcement, we have received a positive response from Macintosh XL and Lisa users in support of the program.

Several unique factors contributed to Apple's decision to offer the trade-in, but the one overriding factor is that Apple feels a special commitment to our customers who supported Apple in a new and different product direction.

Those of you who want to continue using your Lisa or Macintosh XL should know that you own the most powerful Macintosh workstation Apple has ever sold. **Apple will continue to service and support your hardware and software for five years.** In addition, we will be providing additional technical support and training to our servicing Lisa/Macintosh XL dealers so that they can continue to handle your support needs.

For those of you interested in migrating to the new Macintosh Plus and Hard Disk 20, Apple is offering any Lisa or Macintosh XL owner a special trade-in offer. The suggested retail price of these products is \$4098.00; however, **when you trade in your Lisa or Macintosh XL the suggested retail price is only \$1498.00.**

In addition, if you had AppleCare for your system and decide to participate in the trade-in, your **AppleCare coverage can be automatically transferred over to your new Macintosh Plus and Hard Disk 20 at no additional charge.**

The trade-in program is available through participating authorized Apple Macintosh dealers from **April 14, 1986 through August 29, 1986.** For complete details on each program and how to participate, please contact the participating authorized Apple dealer nearest you. The names of participating dealers are available by calling **800-538-9696 (extension 874).** You may also call this number for the names of dealers who are servicing and supporting Lisa/Macintosh XL systems.


We thank you for your support and hope that you, and all the members of your group, continue to enjoy your Apple products.

### **Apple Computer and MS-DOS**

John Sculley, CEO and board chairman of Apple Computer, Inc. has committed the company to meet the needs of corporate PC users, guaranteed that MS-DOS will run on future products, as reported in an exclusive interview

with **PC Week.** He said Apple is "going to make every effort to be as good at implementing capability at the systems level as IBM," and explained that "Apple is not pushing MS-DOS, but is focusing on customer solutions," and "it will be an option; it will not be something standard unless someone wants it."

In explaining about future plans centering around a "true family of workstations, we have the entry product, a Mac 512K, which is more portable, and the more powerful Plus. The Open Mac (reportedly due out in about a year) will be more than a Mac with slots in it."

"We're doing things we've never done before," he said. "I've tried to temper the expectations so that we can build a track record that is very credible. When we say we are going to do something, we actually end up doing it. I think it's the maturity that people have been looking for from Apple and it's one of the things that is going to help us be successful." 

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# Mac Shrink

M.C. Storrie-Lombardi, M.D.

## MAC—IBM CONNECTION

**Q.** I've had two people recently tell me that they would like to consider buying a Mac, but that because their businesses have, or might buy IBM type computers, they believe they should buy an IBM or compatible so they can work at home. I find I really can't argue for the Mac when confronted by this problem. I wouldn't pay \$1500 for MacCharlie if I had to have IBM compatibility; I'd buy IBM or compatible. Wouldn't it be nice if we could buy a 5¼ inch disk drive (\$300?), bring home our Wordstar (yuk!) ASCII files (text only files) on our 5¼ inch IBM type diskete, put them in-

to our 5¼ inch disk drive, load them into MacWrite and work on them, save them to a 5¼ inch floppy, and then back to the office? Is this possible? Would I be able to do this with Lotus 123 at work and Excel at home on the Mac? I haven't heard of any such possibility so there must be problems. (Bill Kaye)

**A.** You're in luck. Abaton has just released a 5¼ inch disk drive that plugs directly into Mac and comes with software to transfer Lotus 123 files to Excel. I don't know if they're actually in the stores yet. Check with your nearest dealer.

system files on the 800K disks. This works well unless you're also using an old Macintosh that doesn't have any 800K capacity.

2. Get the Apple II 800K external disk drive and modify it internally to work on the Macintosh. It has a plug in the back where your 400K drive can be daisy-chained.
3. To get HFS on a 400K disk when initializing it hit OPTION-RETURN after naming it instead of just RETURN or SAVE.

## WANTED

### WRITERS

We wish to appeal to all Macintosh users with a flair for writing. Please send us your articles, reviews or proposals. Articles with hard copy and disk preferred. If you would like a copy of our authors guidelines, please send a self-addressed stamped envelope to our editorial office:

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290 SW 43rd St.  
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### Computer ARTISTS

We are looking for original graphics created on the Macintosh for possible publication in the magazine. If your contribution is selected for publication, we will include your name with the illustration. You may also include a brief description of your technique and the program used to create it.

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## THE 400/800K SHUFFLE


**Q.** Still have a 400K external disk drive but you've upgraded the internal drive to 800K? The 400K/800K disk shuffle has been driving several members crazy.

**A.** At the last S.I.G. meeting we came up with the following suggestions.

1. Use the 400K disks as data disks only. Keep all programs and

## A GREAT PROOFREADER

**Q.** Did you know that Smoothtalker, the talking Macintosh program, is a great tool for proofreading? Let it read your document to you. It's easy to pick up missing words, or words spelled correctly but used out of context. These types of errors are usually passed over by a spelling checker.

**A.** No, we didn't know. What a great idea! 



## Readers Forum

### Mac Plus Comments

Regarding your "Using a Mac Plus" in the April issue: After buying a Mac Plus, I called Assimilation to check on using MacMemory—the RAM disk program. I was told by a technician that MacMemory was incompatible with it.

You say "works well, but leave cache off." With my earlier Mac (upgraded to 1024K by Beck-Tech) MacMemory worked well together with Nevin's TurboCharger cache as long as I kept the K assignment to the later around 100 and was satisfied with a consequently smaller RAM disk. I'd appreciate your

reconciling Assimilation's advice with your statement at the bottom left corner of page 38.

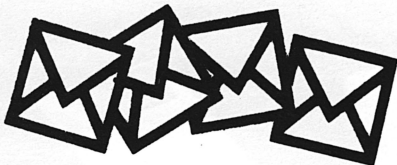
### Macincidentals

- I'm having no trouble using PFS file & report. I called its maker on another matter & was told they were glad I wasn't. They hadn't tested it yet.
- Mainstay reports that TypeNow won't work with the Mac Plus until they get a new version out, *and* the Finder 5.2 and its accompanying new System file has been substituted for the 5.1.
- Genesis Micro of Bellevue was glad to hear that macros already installed by their AutoMac 1.5 still worked on the Mac Plus, but said I might not want to create new ones on the Plus until I had their new version, which is due out in a few weeks.

I'm looking forward to your further reports on the Plus. And best of luck on your new magazine venture! Oh yes, I share your hate for the small-sized righthand shift key. I am considering taping it together with the adjoining cursor key...?

Herbert Ihrig

### LETTERS POLICY



Mac A.P.P.L.E. welcomes letters from its readers on any topic relating to the magazine's content, A.P.P.L.E. services, experiences with hardware and software, current issues in computing, or programming notes. Because of space limitations not all letters can be selected for publication or printed in their entirety, but we try to present a representative sample of your views. If you would like your address published, please include it near your signature.

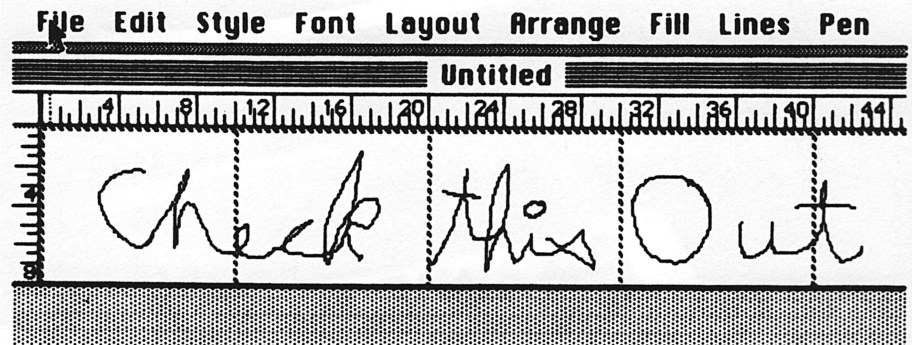
# Across the Desk Top

Bill Kaye

## Banner Maker

I've read about a couple of Mac MS BASIC programs that let you produce large sideways printing on the Image-writer (Usually called banner makers). If you'd be satisfied with freehand scrawl, you can do the same thing using *MacDraw*. Just set the page setup to wide and no breaks between pages, set the drawing size to anywhere up to 9 pages wide, choose reduce to fit to see all the pages, select the freehand tool, a pen pattern of black and the widest pen width, and start writing! (See Figure 1.)

FIGURE 1



## OverVUE

Having trouble with equations that look like they're written correctly but OverVUE rejects? I've had this problem. I found the reason they weren't working was that one or more of the columns I referenced in the equation was not "numeric" data. I had left a column that contained numbers with the Any Text attribute which was fine for data entry but not fine when called from an equation. All I had to do was change the offending column(s) attribute from Any Text to Numeric or Money and all was well.

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