Here at last

The Personal Laser Printer

- Readers' Choice—The 40 Best Macintosh Products
- How to Choose a Desktop Publishing Program
- Supercharge Your Mac SE: 68020 Accelerators
- Mail Merge Tips for Business Correspondence
On September 30, 1985
we announced the most powerful,
most versatile spreadsheet ever.

"If you're a spreadsheet user, Microsoft Excel is one of the best reasons to buy a Macintosh ... After being loyal and dedicated 1-2-3® users for several years, we've just recently converted all our 1-2-3 files over to Microsoft Excel. It's that good."
Don Crabb, InfoWorld, November 10, 1986

"Microsoft Excel is unquestionably the most powerful spreadsheet program available on any personal computer."
Lon Poole, Macworld, September 1985

"In terms of features and ease of use, Microsoft Excel makes 1-2-3 look rather pale."
The Seybold Outlook On Professional Computing, October 20, 1986
“Microsoft Excel is easy to learn, but better, it’s also easy to use. Best of all, you can easily get at Microsoft Excel’s powerful macro capability.”  
Jerry Pournelle, Byte, April 1986

“Microsoft Excel has implemented the most all-inclusive and powerful use of linking yet seen in micro spreadsheets... It offers what appears to be an almost unlimited range of application possibilities.”
Will Tompkins, The MACazine, Vol. 2, No. 10

“A powerful spreadsheet program with equally powerful data-base and charting (or graphics) capabilities, it offers substantial improvements over comparable PC-DOS programs in all three areas.”
William Zachmann, Computerworld, December 8, 1986

It seems we underrated it.
Departments

11 Mac Bulletin
   Late-breaking news.

17 David Bunnell

31 Letters

45 Commentary/Jerry Borrell

60 Contributors Notes

65 Steven Levy

79 Verbatim
   Adobe's John Warnock on PostScript's
   past and future.

173 New Products
   A quick look at new Mac software,
   hardware, and accessories.

187 How To/Quick Tips
   Better BASIC numerical rounding, text
   rotation in Word, head-parking
   pointers, jClock caveats, and more.

199 How To/Getting Started with Networking
   An introduction to communal
   computing.

215 How To/Insights on Microsoft Word 3.0
   Twenty tips that make Word work the
   way you want.

229 How To/Mac Communications Tools
   All about bulletin boards.

247 Updates
   The latest software upgrade news.

263 Where to Buy
   Information on products in this issue.

276 Best-Sellers

91 Macworld News

- Super Floppy Disks  Jasmine
  introduces a 10-megabyte floppy.

- AP Broadcasts News Graphics to
  Macs  Mac graphics via satellite.

- The Mac Joins the OSI World  New
  software from Touch connects Macs
  with VAXs and IBMs.

- Reality Strikes  Gray-scale image
  processing from Letraset.

Plus, more bargain games, profile of a Mac
design pro, new programming tools, the Mac in
the space program, and more.
Features

108 The QuickDraw Solution
In which we answer the question, What did General Computer give up to bring out a $2500 laser printer?

114 World Class Macintosh
The moment we've all been waiting for: the results of our reader poll on the best Mac products.

124 The Desktop Publishing Shopper
A desktop publishing software guide that helps you match the program to the purpose.

132 Beefing Up the SE
Make your SE run like a II—or faster—with a 68020/68881 coprocessor board.

140 Mastering Mail Merge
Tools and tips for easy mass mailings.

146 Desktop Design
A hands-on trial of the first Mac II color design workstation—the Lightspeed Color Page Layout System.

Reviews

150 The Original Gets Better
At last, PageMaker 2.0.

152 Easy E-Mail
OfficeTalk Mac-style network.

153 Statistically True
Systat moves down from minis.

154 Printing Potential
Printworks printer drivers plus.

155 MacEverything
LaserPaint integrated graphics, text, and page-layout program.

157 Dark in the Heart of Texas
OmniLaser 2108 printer from TI.

158 Film Scoring Simplified
Cue and Clicktracks.

160 Reading by Computer
Portal interactive novel.

161 For FORTH Programmers
Mach 2 FORTH development system.

162 Two Electronic Editors
Doug Clapp's Word Tools and Tools for Writers.

163 Shareware DA Text Utilities
Grep-Wc, miniWriter, Smart Quotes.

164 Using the LaserWriter with the PC
TOPSPrint, PSSprint, and LaserScript.

166 A Pair of Deuces
Plus-20, Magic20 SCSI hard disks.

168 More Castle Hassles
Shadowgate fantasy game.
DISCOVER UPTIME. Build an exciting library of programs for less than one dollar each. You deserve value. At UPTIME value is yours. Each month over 30,000 people just like you enjoy UPTIME. Your disk arrives with eight programs and more every month...

Enjoy eight programs including two new desk accessories on each monthly disk. Make your life easier. Get more from your Macintosh. Organize and be more productive with home and business management programs. Learn with educational programs. Enjoy all the games and adventures. Using your Macintosh is now a snap with tutorials and desk accessories.

It's easy, inexpensive and fun. It's UPTIME! Too good to be true? There's even more! Each monthly disk has reviews of the latest software, hardware and peripherals. Save time and money. Learn the strengths and weaknesses of each item we evaluate. Shop “on the disk” in our Micro Discount Mall.

Subscribe now and save. You won’t believe the low price! Satisfaction is guaranteed — or your money back. You'll be amazed at just how much comes on every UPTIME disk. Make the very next one yours. Fill out the coupon. For immediate service call toll-free:

1-800-437-0033 anytime, day or night.

FROM Volume 1, No. 8
Small View ■ Alphabet Talker ■ Saviour DA ■ Armonk Font ■ File Function Key ■ Kaleido ■ Panic! ■ Stuntcopter
Circle 537 on reader service card

I'LL BYTE!!!
SAVE 12
$9.90

Disk Issues 6 $9 $6
Disk Issues 3 $36 $36
(Add $2 per issue in foreign countries, except Canada and APO)

QUALITY PROGRAMS
LESS THAN $1 EACH

UPTIME immediately.

Name ____________________________ State ______ Zip ______
Address ____________________________ City ______
Type of Computer ____________________________ (Please make checks payable to UPTIME)
Payable in: □ Check □ Money Order □ Visa □ MasterCard Exp. Date ______
Signature ____________________________ Account No. ______

Send to:
UPTIME PO Box 259
Newport, RI 02840
(401) 849-0421

MW9
Ten thousand pages, take it or leave it.

For those of you going places, here’s a little something that solves big storage problems in the time it takes to say “who has the Farnsworth financial files?”

Introducing Tutem:

A rather revolutionary Bering 20 mb Bernoulli compact disk drive system for Macintosh computers. And, the first truly portable 5¼” system. One that lets you tote around 10,000 pages of data on a sleek cartridge about the size of a piece of bread.

Translated, that’s 25 times the storage you get on one standard floppy.

Yet unlike floppy’s, the Tutem is no slouch for speed. It’s just as fast as a hard disk. In fact, your computer will think it’s a hard disk. You can even share it with co-workers. And its advanced Bernoulli aerodynamics make it resist head crashing. If you’ve ever used hard disks, you know what a pain that can be.

But the real beauty of Tutem is that it fits perfectly right under your Mac. No mess. No fuss. And no extra hardware to buy. To add storage, just pick up another Tutem cartridge.

Last, but certainly not least, there’s a whole family of Tutem drives to choose from. They’re all in the brochure. To get yours, write or call Bering Industries, Inc., 280 Technology Circle, Scotts Valley, CA 95066. Inside California, call 800 533-DISK. Call 800 BERING 1 outside California. Just say “I’ll take it.”
LightspeedC™ is here. Spend your time creating.
Not waiting.
Compile at 15,000 lines per minute. Link the largest programs in two seconds. Make edits as fast as you can type.
LightspeedC brings a new level of speed and efficiency to the development of Macintosh applications. This high performance programming environment combines a multiwindow text editor, compiler, linker and auto-make facility—all in one high speed system.
The compile-link-test cycle is so lightning quick, you can actually make one change at a time. Test assumptions. Explore alternatives. Go ahead, take a few chances. If you're wrong, you can correct yourself in a flash.
In fact, LightspeedC is so fast, it will dramatically shorten the development cycle. And improve the way you work.
LightspeedC gives you all this and more for just $175. For more information or the name of the dealer nearest you, call us at the number below. Find out how fast you can make mistakes. And correct them.

Lightspeed Pascal™ is here. Now you can track down errors quick as a click.
Compile at 10,000 lines per minute. Link in a blink. Debug in record time.
Lightspeed Pascal gives you the power to create your own standalone Macintosh applications. Quickly and easily. It includes a text editor, compiler, linker, project manager and intelligent debuggers—all in one easy-to-use package.
Source-level debugging means you can use all the power of Lightspeed Pascal without leaving your program. Trace through your application statement by statement—one step at a time. Plus, Lightspeed Pascal automatically points out bugs as you type your program.
What's more, Lightspeed Pascal's Project Manager automatically recompiles and relinks only the parts of the program you change—with a single keystroke.
Lightspeed Pascal gives you all this and more for just $125. For more information or the name of the dealer nearest you, call us at the number below. Find out how fast you can make mistakes. And correct them.

THINK Technologies, Inc.
135 South Road, Bedford, Massachusetts 01730
617-275-4800 · 1-800-64-THINK (Sales)
LIGHTSPEEDC and LIGHTSPEED Pascal are trademarks of THINK Technologies, Inc.
Macintosh is a trademark of McIntosh Laboratory, Inc. and is used by Apple Computer, Inc. with its express permission.
YES, THEY TOO ARE HAYES COMPATIBLE.

Our idea of "Hayes Compatible" has nothing to do with other modems and everything to do with personal computers. Which is the reason why Hayes modems are compatible with over 100 different personal computers, including all Apple® computers.

For the Apple II, II+, IIe, IIc and IIGs, we offer the Smartmodem 2400™ and Smartmodem 1200™. Or the internal Smartmodem 1200A™, a modem that plugs into Apple expansion slots for fast, economical 1200 bps operation. And our new Smartcom I®, powerful menu-driven software with autodial/autoanswer and XMODEM protocol, brings out the best in both Apple computers and Hayes modems.

Our Smartmodem 2400 and Smartmodem 1200 are also compatible with all versions of the Apple Macintosh™, including the Macintosh Plus, Macintosh SE and Macintosh II. There's even a specially bundled package for the Macintosh that contains a Smartmodem 1200, modem cables and Smartcom II® software. Smartcom II is our award-winning software specially designed to take advantage of the power and graphics capabilities of the Macintosh.

Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.
Now teachers don’t have to go strictly by the book.

For years, textbooks (and an occasional guest lecturer) were all that the faculty needed to implement their teaching plans. But now that the computer age has reached college age, an entirely new course has opened up for professors: The Academic Courseware Exchange, which has been developed by Kinko’s Copying.

It’s a way for faculty members to incorporate educational software for the Macintosh® and Apple II personal computers into their classrooms. At a cost to students that’s comparable to textbook prices, from $8 to $40.

Academic Courseware Exchange software has been developed by faculty members for faculty members—to help them teach their chosen subject better. Be it history, chemistry, business, electrical engineering or hotel management. And each program is tested in real classrooms before it’s ever offered to the faculty.

Becoming part of the Courseware Exchange is incredibly simple. Better yet, it’s free.

Just call Kinko’s at (800) 235-6919 for a complimentary copy of the Academic Courseware Exchange catalog. It describes over 100 software titles. And explains how professors can qualify to preview one program at no charge—before deciding if it should become part of their curriculum.

Rest assured, once you do decide to use a particular program, your students don’t have to go out of their way to get it. Academic Courseware Exchange software is ordered through Kinko’s Copying, at over 300 campus-close locations nationwide. Or, Kinko’s will be more than happy to have your software delivered right to your school.

So call for your free catalog today. If you believe in going strictly by the book, this is one book that could change your mind.
HE'S GOT THREE QUESTIONS.
YOU'VE GOT TWO ANSWERS.
YOU NEED MORE.

Next time, get your act together.
With Living Videotext's MORE, you can organize your presentation, anticipate every objection. And win.
So call 1-800-822-3700. In California, 1-800-443-4310.
And before you know it, you'll be the one asking all the questions.
System Tricks

> Had any trouble with System Folders you've copied from a hard disk onto a fresh floppy? System versions after 3.2 don't include the Macintosh boot blocks on disks they initialize; the change was made to handle situations in which network users must access an application on an alien computer's disk—say an IBM or an Apple IIGS.

To solve the problem, drag the file labelled System 4.1 Boot Blocks onto the floppy disk and double-click on the file. If your System Tools disk doesn't include this file, contact your Apple dealer for a copy. As a stop-gap measure, you could resort to Fed's Right Boot Blocks modification, but the simplest fix is to drag an application program onto the disk and start it up; the application assigns the right boot blocks when it opens. If that doesn't work, first copy System 3.2 and Finder 5.3 onto the disk, throw them away, and then drag on the current System and Finder.

### Educational Exchange

> For the first time ever, developing courseware—educational programs created as instructional aids—has become a paying proposition because of royalty payments offered to authors by Kinko's. The chain of 320 copy shops has been distributing more than 100 programs on 22 campuses nationwide through its Academic Courseware Exchange, helping fill the void of software for higher education.

Through the Kinko's network, students at the University of Utah and other participating schools can buy, for roughly the price of a textbook, programs dreamed up for classes on other campuses, such as Drexel University's Molecular Editor for chemistry majors or Treaty of Versailles, which lets students make the international boundary decisions that faced the Allies after World War I. A leading source of courseware, Philadelphia's Drexel University keeps 60 percent of the royalty and gives 40 percent to the individual student, faculty member, or faculty member who authored the software.

### AppleShare 1.1

> Apple recently released a free upgrade for its AppleShare network server software. It's faster and more responsive than the original, according to Apple. Other new features include automatic optimization of the server's RAM cache, display of user passwords at the time they are defined, and multiple foreground processing to allow users to concurrently run programs such as printer spoolers and automatic server backup utilities. The new version runs on the Macintosh Plus, the SE, and the Mac II, but it doesn't prevent individual network users from kidnaping public folders and hiding them away in password-protected folders, a source of some grumbling by users (and competitors). Apple representatives claim that's not a bug, saying that network administrators must learn how to lock the root directory. AppleShare 1.1 is available through Apple dealers.

### Style on the Menu

> If you've ever changed the font throughout a document, only to realize too late that you had meant Boston instead of Oxford, a new desk accessory called MenuFonts ($17 postpaid) may be for you. The DA from Tucson-based Beyond Utilities (602/323-4577) shows each name on the Font menu in its own typeface rather than in the standard Chicago font. It works on Macs with 512K or more of memory but functions only with applications or other desk accessories that use the standard Font menu, such as MacWrite, WriteNow, and MindWrite (not, for example, Microsoft Word, MacAuthor, Word Tools, Ragtime, or miniWriter). A pictorial font obscures the font above it on the menu, but you can still click on both.

### PC-to-Mac Made Easy

> Dayna Communications of Salt Lake City recently released a new product that drastically improves upon its previous MacCharlie and FT100 IBM PC-to-Mac products. DaynaFile, a SCSI external disk drive for IBM floppy disks and accompanying translation software, makes transferring files from the PC as easy as dragging an icon from one disk to another. The IBM disk's directory turns into a disk icon on the Mac desktop, its subdirectories arrive in the form of folders, and files take the shape of document icons. That means Mac users can copy, open, or edit files from IBM programs such as 1-2-3, WordPerfect, dBase III, and PageMaker PC without even once confronting the dreaded MS-DOS A> prompt.

The package starts at $595 for a single 51/4-inch drive with 360K capacity. Buyers can choose a second IBM drive in 51/4-inch 1.2MB format or a 3 1/2-inch drive formatted for either the PC Convertible or the PS/2. The latter option may lead to an ironic twist of fate: the Mac could end up as the tool of choice for companies converting their IBM PC files to the new PS/2 system.

### Dynamac Plus

> The Golden, Colorado-based company that produced the first laptop Mac by gutting a Mac Plus has announced the Dynamac GP, a portable Mac with a 512-by-342-pixel gas plasma display. The $3995, 17-pound unit is similar to the original Dynamac EL ($4995), which comes with an electro-luminescent 640-by-400-pixel display. The EL screen has a finer pitch and supports the E-Machines large screen without any internal adjustments.
The Finder Evolves

Transforming the current Macintosh system into one that runs multiple applications is no easy feat. This month Apple plans to ship MultiFinder (previously known as Juggler), the next major step in the evolution of Mac operating system software.

With MultiFinder you can run multiple applications in separate windows on the desktop. Although many applications are visible at once, only one program can be active at a time; you jump from one to another by selecting the desired window.

While MultiFinder doesn't turn the Mac into a true multitasking operating system, specially written programs can run in the background, leaving the Mac free to do other things. The first of these background programs to appear is a laser printer spooler that comes with MultiFinder. Expect to see other such programs, like terminal emulators that let you download files in the background. MultiFinder is slated to ship as a four-disk set for between $50 and $75.

Speeding Up Network Access

Announced at the Macworld Expo in August, the EtherTalk board from Apple Computer allows the Mac II to take advantage of the 10-megabit-per-second throughput speeds possible on Ethernet networks—about five times faster than AppleTalk. Essentially, EtherTalk is AppleTalk running on Ethernet cables and with Ethernet protocols. Users can choose AppleTalk or EtherTalk from the Control Panel. Because

the network protocols differ, Apple has developed the AppleTalk Address Resolution Protocol to translate between them. Apple is working closely with third-party developers such as Kinetics, maker of AppleTalk-to-Ethernet gateways for the Mac Plus and SE, to ensure product compatibility.

VersaCAD Meets the Mac

VersaCAD, one of the most popular computer-aided-design programs in the IBM PC world, is slated to come out in a Macintosh version by the end of the year. At the Boston Macworld Expo, Versacad Systems of Huntington Beach, California, developer of the program, demonstrated a prerelease edition. "This is not just a quick port to the Mac," said spokesperson Scott Harlin. "We've reprogrammed it entirely, making use of the Macintosh interface."

HyperCard Thinks Like You

Now you have the best reason of all to own a Macintosh: it can "think" like you do. When you think, you use logical connections and specific information peculiar to you. A new program by MacPaint designer Bill Atkinson lets you organize information in a way that seems natural to you.

It's called HyperCard, and it consists of four disks of programs and ideas. Apple Computer introduced it at the Macworld Expo in Boston. HyperCard will be packaged with every Macintosh and will also be available through Apple dealers, user groups, and bulletin boards.

Here's how HyperCard works. You write or paint your ideas on a card displayed on the screen—maybe a few free-form notes about something you're reading. After a while, you have a "stack" of cards that you can instantly search for just the material you want. In addition, cards can be linked to other cards. Since you create these logical links, your stack closely parallels the way you process information. HyperCard stacks could even become products that are licensed, sold, or given away.

In fact Atkinson figured he'd start the ball rolling at the Boston Expo by giving away 1000 disks that contained his personal stacks.

A New ImageWriter

Shoring up the middle ground in its line of printers, Apple is introducing a high-resolution dot matrix printer, the 15-inch ImageWriter LQ ($1500). Faster and more versatile than the existing ImageWriters, the LQ also produces better-looking type. Its 27-pin printhead produces roughly twice the resolution of its predecessor's 9-pin printhead. To go along with type good enough for business correspondence, the LQ improves paper-handling to make it easier to print envelopes, labels, and forms.

Mac SE Glitches?

Online give-and-take among Mac users on CompuServe and elsewhere indicates that some new Macintosh SEs may have slight distortion of on-screen images. Noisy fans have also generated complaints from users.

The reported distortion includes images that don't quite line up squarely on the screen and images that look somewhat pinched—apparent especially when a Mac Plus and an SE sit side by side.

At press time Apple had not commented on the reports.

The Mac Learns Chinese

Pulling the latest international trick out of its hat, in June Apple introduced a Chinese-language operating system for the Mac, called Zhongwen Talk.
If you're doing graphic design or Desktop Publishing, the Accelerator™ allows you to create and combine pictures and text at unprecedented speeds.

For time-intensive processing tasks like spreadsheets, scientific computations or sorting through databases, the Accelerator will redefine your concept of personal productivity.

If you're using a Macintosh™ as a file server, the Accelerator will earn smiles from everyone on your AppleTalk® network.

The Accelerator quadruples the processing speed of every Macintosh application. The Accelerator is powered by the same 32-bit microprocessor that commands the Macintosh II.

In addition, it has a high speed hardware cache. This technique, craftily borrowed from mainframe technology, automatically places frequently used information into high speed memory where it can be retrieved at the full speed of the MC68020. It reduces the cost, board space and power requirements of the system.

Which is one of the reasons why the Radius™ Accelerator board is such an exceptional value. For those of you who think numbers speak louder than words, the Accelerator is available with an optional 68881 coprocessor that blazes through floating point computations up to 100 times the speed of the Macintosh Plus.

What do you have to give up for all this blinding speed? Nothing. An Authorized Radius Dealer can install an Accelerator board in your Macintosh Plus or SE computer in a matter of minutes.

But wait. Did we really say wait? The Accelerator has another unique feature. The MagicBus™.

The MagicBus allows you to further expand your Macintosh with yet another internal expansion board. So you can add future products from Radius or other developers.

Of course, you could use the MagicBus immediately—to install the ultimate Desktop Publishing peripheral. The Radius Full Page Display™ (FPD).

Like the Accelerator, the Full Page Display was designed by several key members of the original Macintosh team.

Today these people are at Radius creating enhancements for the Macintosh that are setting standards for the industry.

If you really want to get the most out of your Macintosh, see a Radius dealer today. And save yourself a bundle of time.

Circle 577 on reader service card

For the name of the Radius dealer nearest you call 1-408-434-1010.
If you want to know why FullWrite

Within the next ten minutes, your entire concept of word processing will be turned upside down.
FullWrite Professional™ sets new standards for word processing.
It lets you handle words better, faster, more powerfully, with more versatility than any other word processing program. But competing in today's world requires even more. Now, documents need the persuasive power of text and graphics combined.

That's why FullWrite Professional easily turns our words into fully illustrated documents, and even generates the graphics. Chances are, you'll never need a page layout program.

FullWrite Professional is going to change serious writing forever. Here's why.

- **WYSIWYG multi-column display.** What you see on the screen is exactly what prints on the page. With automatic repagination, as you type.
- **Full desktop publishing look.** Drop in any shaped image, and watch the text wrap around it automatically. Create sidebars to mix multiple column sizes on the same page, as well as multi-column headlines. Automatically revises layouts while you edit.
- **An integrated MacDraw®-like drawing environment.** With Bezier curves similar to Adobe's Illustrator™ for smoother, more natural looking curves. Bit-mapped graphics are automatically converted to laser resolution objects for easy cropping, scaling, and re-sizing.
- **Change bars.** Visually highlights changes between drafts of a document.
- **Posted notes.** Append comments and observations directly to a document without affecting the text. Notes are automatically stamped with the time, date and name of person making the comment. Make comments individually or as a group.
- **Browser.** Quickly scan footnotes, posted notes, pictures, virtually any user defined category, through a special window, without looking through the entire document.
- **Outlining.** Sophisticated, powerful outlining that rivals the best stand-alone products.
- **Automatic free upgrade.** All registered owners receive a free media upgrade to the next version, automatically.
- **Power word processing features.** All the stan-
FullWrite Professional is not just for professional writers and communicators. It's for managers, account executives, and secretaries, too. It is the word processing program for the future. Your future.

If you can operate a Mac Plus, SE, or II (anyone can operate a Mac), you can use FullWrite Professional. Right away.

It's what word processing was meant to be. And it's going to change serious writing. Forever.

FULLWRITE PROFESSIONAL

ANN ARBOR SOFTWARES
With reviews like these who needs advertising?
They say the best advertising is word of mouth. So we're reprinting some of the multitude of words that have already been said about MicroPhone communications software for the Macintosh.
And what they're saying, universally, is that MicroPhone—created by Dennis Brothers—has far outdistanced all its predecessors.
That for the novice, MicroPhone is the simplest telecom software ever devised. That for the expert, MicroPhone is the most powerful.

On-line for the lazy.
MicroPhone gives you the means to create infinitely elaborate macro (automated) routines with infinite simplicity. Its powerful script language is written in plain English, and it also features a recording mode that grabs, saves, and repeats what you do. So no programming skills are required.
The upshot is that MicroPhone will save you time, hassle, and on-line fees by automating virtually every operation you now have to key by hand. Log on procedures. File transfers. And, for a good example, E-mail retrieval routines.
At a single command from you, MicroPhone will dial your E-mail service, give you your ID number and password. Navigate its way through the labyrinth to your mailbox. Check for mail. Log off if there is none. And if there is, MicroPhone will collect, print, and save all messages to your disk. Then, politely log off.

If you prefer, you can direct MicroPhone to initiate this sequence simply by inserting the disk. Or automatically, at any specified time, day, night. Or at regular intervals.
Anything else you need to do, from collecting stock quotes to sending and receiving files, is just as simple.

Try it out at home or office.
You can find out firsthand just what a remarkable program MicroPhone is. Without risking a cent. We give you a thirty-day moneyback guarantee, no questions asked. Which is virtually unprecedented in software.
Since MicroPhone is not copy protected, we obviously have vast confidence both in our program. And in you.

Let's get technical.

60 to 57,000 Baud
Supports XMODEM
YMODEM
ZMODEM
ASK
16 blocks
Network
MacPhone
MacPhone 1.1
Emulates TTY
VT52
VT100
Captures the ON
Printer On/Off
Auto log on scripts for interaction utilities provided

Scripts invoked by button
Message command key
Scripts have full copy convention
Works with ALL Macintosh models & LaserWriter
Works with all major modems
Packets included
Includes yanchik 4
CanynServe subscription
Includes text editor licensed
Iron Director of the Phoenix Inc.
Documentation by Neil Shapiro

MicroPhone Communications Software for the Macintosh

MacUser Editor's Choice Award

SOFTWARE VENTURES
2907 Claremont Avenue Suite 220 Berkeley, CA 94705 415-644-3232

Circle 768 on reader service card
The Online Brain Drain

The FCC has proposed to double online costs by imposing a steep access fee. Good grief! Don't just stand there—sit down and write your congressman.

If it has its way, the Federal Communications Commission will change the slogan of the Information Age from "Don't commute, telecommute" to "Telecommute, pay tribute."

Its recent proposal would have the effect of drastically increasing rates for computer owners who communicate via modem over long-distance phone lines. Don't let the FCC do this to us.

The measure is aimed at private telephone networks such as Tymnet and Telenet, as well as online information facilities like CompuServe, The Source, Dow Jones, and others. The FCC wants to charge these networks a special "access fee" of $4.50 to $5.40 an hour for long-distance service.

But guess who's going to be stuck with that extra fee? The customer, of course. We'll end up paying about 50 percent more than we're paying now. As usual.

If enacted, the proposal will go into effect January 1, 1988. Before that happens, however, the FCC is opening the matter up to public comment. So here goes.

I think a little straight talk is in order. Some judicious arm-twisting of our senators and representatives in the nation's capital may not be a bad idea, either.

But just for the record, I'm not entirely unsympathetic to the FCC's concerns. This may surprise you. In fact, I had a very nice chat with an FCC attorney, Ruth Milkman, who explained why the FCC is doing this.

"The problem," Milkman told me, "is that computer users are not paying anything right now for the use of the local exchange, as they do when they make a regular long-distance call."

Cast your minds back to 1984 when Ma Bell's giant telephone monopoly was broken up into regional Baby Bells. Long-distance companies like AT&T, MCI, Sprint, and others began using those regional Bells to connect customers to long-distance lines.

Subsequently, so-called "packet switchers" like Tymnet and Telenet appeared on the scene, offering long-distance services to people wishing to access online computer information. These services make highly efficient use of lines leased from the telephone companies, shooting "packets" of data bits through phone lines at the incredible rate of 56,000 bits per second. Users now pay only for the local call to connect to these networks. Thus they avoid paying regular long-distance fees.

"So who's paying for all those long-distance calls?" I asked Milkman.

"Somebody is," she said. "It's probably all the other long-distance customers. It then becomes a question of 'Should Aunt Minnie subsidize Joe Computer User?'"

Milkman explained that when the FCC first introduced the system of access charges in 1983, it was concerned about what effect a sudden increase of rates might have on a fledgling telecommunications industry. "So we decided to give the enhanced-service providers a temporary exemption—to give them time to figure out how to deal with the situation," she said.

"Why now? Why make them pay now?" I asked.

"It's always been commission policy that anyone who uses the local exchange to provide interstate service should pay for the use of the local exchange," she replied. "They've sort of had a freebie for a while, but now we're proposing to eliminate the exemption. Otherwise consumers will get the wrong signals about how expensive it is to use the telephone system—and about what the real costs are."

Now, there are wrong signals and there are inconsistent signals. I happen to think that the government, in proposing to charge fees for online access, is sending an inconsistent signal to consumers.

I share this view with Charles McCall, president of CompuServe, one of the aggrieved parties in this telecom witch-hunt.

"On one hand, you have the Justice Department telling [District of Columbia]
Decisions, Decisions,

Choose with confidence from Jasmine's wide range of quality, innovative products at affordable prices. From the pacesetting Direct Drive series, to the unique BackPac 40, you never compromise quality for price when you purchase a Jasmine product. Discover why MacWorld (July 1987) said "It's easy to fall in love with the quiet Jasmine drive."

MegaDrive™

Hard drive power with the freedom of a floppy.

MegaDrive™ is a high speed, SCSI storage device featuring removable, 10 megabyte, MegaFloppy™ diskettes which are much more reliable than other removable, mass storage products. Compact in size, it fits under your Macintosh or into a Macintosh carrying case.

In a word, MegaDrive™ is flexible. It has something for every Macintosh user. Accountants can put each account on its own disk and lock them away for safe keeping. Desktop publishers can put fonts, clip art, layouts and different clients on separate MegaFloppy disks. Musicians can organize their sound libraries and samplings and the average Macintosh user can finally make heads or tails of the mountains of floppy disks they've acquired over the years!

MegaDrive™ $999

MegaFloppy Disks: $39.95 each ($41.15 Visa or M/C)
MegaFloppy Three-Packs: $109.95 ($113.25 Visa or M/C)
*Three packs include handy storage case

To Order Call (415) 621-4339

Remember that Jasmine saves you 40% or more.

Our prices include 30 Day Trial/Money Back Guarantee, and Full One Year Warranty.

Every drive is shipped with a technical hotline number to answer any questions. MegaDrive, Direct Drive 20, 40, 50, 80, 160, BackPac 40, Jasmine, are trademarks of Jasmine Technologies, Inc. Product specifications and prices are subject to change. Prices include 2' cable and FD software. Prices do not include shipping. CA sales tax (6.5%) or special rush handling Apple is a registered trademark of, and Macintosh is a trademark licensed to Apple Computer, Inc.
Direct Drive Series
Hard drives that re-defined value and quality.

From the Direct Drive 20, to the revolutionary Direct Drive 80, Jasmine now offers a full spectrum of drives to meet every user's needs. Our newest addition, the Direct Drive 160, offers an incredible combination of power and speed for just $2899! The Direct Drive series is synonymous with excellent construction, no cost "extras" and high reliability.

"The Jasmine Direct Drive 80 is an excellent value, offering not only outstanding price and performance, but an excellent price against the small disk market as well. InfoWorld highly recommends looking at this drive for your Macintosh."

- InfoWorld
June 29, 1987

"The Drive ran flawlessly during the review period, with very good performance and no compatibility problems of any kind."

- MacWorld
July 1987

BackPac 40™
Portability and Power for the Macintosh Plus

The introduction of the incredible BackPac 40™ has established Jasmine as the leader in innovation as well as value. Weighing less than 3 pounds, BackPac 40 silently integrates 40 megabytes of power into the "upgrade path" Macintosh Plus" owners so desperately need. The convenience and portability of an internal hard disk with the reliability and ease of installation of an external SCSI hard disk.

BackPac 40  $1299
($1339 Visa/MasterCard)

Call for dealer and developer pricing.

Jasmine Technologies, Inc.
555 De Haro Street, San Francisco, CA 94107

Circle 747 on reader service card
David Bunnell

Judge Harold Greene that he should break up the Bell operating companies so that they can help promote the home information service, the videotex-type business," McCall notes. "On the other hand, you have the FCC trying to raise these rates to the point where it would kill that business."

McCall is absolutely right. The fees would kill that business—and if they didn’t, then they would cripple it and otherwise render it senseless.

I believe that the pricing of these computer networks is crucial to the development of our information culture and society. I would even venture to say that The Source and CompuServe, which now charge about $6 per hour at a 300-baud rate, are still probably priced too high to be broadly popular. Raising that fee to $9 or $10 would put those information services even further out of reach for most people.

We’re talking about a potential online brain drain, when people stop using information services or telecommunicating because they can no longer afford to do so.

I’m not so concerned about medium- and large-size businesses in this case. They can absorb the increase, probably even pass the extra costs on to their customers. No, I’m mainly worried about users. This money will have to come out of their personal pocketbooks. It’s going to have to come from the same hard-earned dollars they use for going to the movies, buying milk, and otherwise staying alive.

By keeping the doors open, by not charging an access fee, the FCC would be encouraging the development of the entire computer industry and of the whole mode of electronic communications.

Just look at any of those online services and observe the enormous amount of creativity that’s going on. Putting a surcharge on long-distance access to online bulletin boards and data services would stall this creative momentum. It would also adversely affect sales of modems and communications software.

Not only would the established computer industry be damaged by the FCC’s proposal, but at least one fledgling information industry may bite the dust before it’s even had a chance to spread its wings.

I’m referring to the advent of videotex services in this country, modeled after France’s hugely successful Minitel system. To date, the French phone company, PTT, has installed about 2.5 million of these small, inexpensive videotex terminals in French households at a cost of about $10

(continues)
Build color into your graphics with an HP plotter.

Whether you’re building sales revenues or designing new kitchens, Hewlett-Packard’s family of color plotters will make your overheads and CAD drawings more effective. How? With the powerful advantage of high-impact color. An HP graphics plotter will turn your Macintosh into a color graphics powerhouse.

Build enthusiasm at your next presentation with vivid, high-quality overhead transparencies. And highlight important management reports with crisp, professional-looking charts and graphs. All easily prepared by any of HP’s business graphics color plotters.

If you’re designing parts or building up the skyline, color-coded drawings in sizes A through E will make your designs easier to understand and execute. An HP DraftPro or DraftMaster plotter will quickly produce sharp, precise drawings on paper, vellum, or polyester film.

And all HP plotters integrate easily with your Macintosh and popular graphics software such as Microsoft Excel, Cricketgraph and MacDraft.

For a sample plot, a brochure and name of your nearest HP dealer, call 1-800-367-4772, extension 688A.

Microsoft Excel is a registered trademark of Microsoft Corporation. Floorplan provided by Grove Associates, Palo Alto, California. ©1987 Hewlett-Packard Co.
Or, you can just get our big screen.

They came. They saw. They got eyestrain. But you don’t have to be from outer space to know that’s exactly what happens when you stare at a computer screen for too long. Unless, of course, that screen happens to be unusually large, and easy to read.

Like the new Stretch Screen™ from NSI.

Stretch Screen is a 20” high-resolution monitor that works with any Macintosh™ from the 128K all the way up to the new SE.

It’s got over a million screen pixels (1024 x 1024, to be exact) so you get a full 80 dots per inch of crystal clear viewing. Which means that laying out multiple pages or tracking monster spreadsheets is a beauty to behold. And tilt and swivel positioning makes it easy not only on the eyeballs, but on the neck and back, too.

That’s not all. Unlike other large monitors, the Stretch Screen installs in just fifteen minutes, thanks to a unique clip-on card that simply snaps onto your Macintosh’s motherboard. (The cable fits neatly into the security slot.) With no soldering required, the Stretch Screen won’t void the Apple warranty, and it comes with a full, one-year warranty of its own.

Eye the power of a Mac II.

There’s nothing alien about wanting big performance to go with your big screen. That’s why we built the Jump! Board 020™. This clip-on upgrade installs in the same easy way as the Stretch Screen and gives you up to four megs of RAM, two different clock speeds (12 or 16Mhz), and a performance increase of 400% over the Mac 128K.

Want to get a good look at these products? Call us at (415) 467-8411, Fax (415) 467-2516 and we’ll give you the name of the NSI dealer nearest you. He’ll show you an eyeful.

Network Specialties, Inc.
Trade up to Word, and we'll give you $75 for MacWrite.

You can't go MacWrong.

Microsoft® Word Version 3 is the most powerful word processor available for any PC. Yet moving up to it from MacWrite® couldn't be easier.

Word reads MacWrite files, so you'll still be able to read and write to your old documents.

Word's “short menus” are almost identical to MacWrite's, so you'll hardly notice the changeover.

And anyway, we're offering you a bribe.

Here's the deal:

You get Word. Then you send us your original MacWrite disk, Word registration card and proof of purchase.*

And we send you $75.

Call us crazy; if you like. But call the number below, or see your local Microsoft dealer.

Before we come to our senses.

1-800-323-3577

Microsoft®

*Minimum purchase price, $200.

This offer is not good in conjunction with any other promotion or upgrade offer and is good in the U.S. only from June 15 to September 30, 1987. In Alaska call 206-882-8888.

Microsoft and the Microsoft logo are registered trademarks of Microsoft Corporation. MacWrite is a trademark of Apple Computer, Inc.

David Bunnell

per month. It's proven to be a financial bonanza. Last year Minitel generated about $135 million in revenues for service providers, not to mention $94.3 million worth of telephone traffic—on top of who knows how much in untapped packet-switching revenues—for the French state-owned telephone company.

Impressive, n'est-ce pas? And, ooh-la-la, the array of services that are being gobbled up by French consumers! I was looking at a recent issue of the French computer magazine, Science & Vie Micro, which listed the “300 best services.” Among them: dog club bulletin boards, electronic message services, plane and train reservations, local municipal information, tax services, weather and traffic information, various money management services, even horse-race betting.

There's a phone jack in the back of the Minitel terminal, and within ten minutes of basic familiarization, you're on. These machines don't even look like computers, although it's possible to run PC applications on specially configured models. The American version of the Minitel even has a retractable keyboard to disguise the computerlike appearance of the machine.

In other words, this could be the breakthrough item to captivate the next big wave of computer users—the Aunt Minnies of America, if you will.

But now the FCC wants to roll us back to the baudless Middle Ages by imposing its horrendous access fees.

I was sitting in the office of Nicolas El Baze, a young Frenchman who heads the San Francisco branch of Paris-based Softway, Inc. This international marketing and engineering firm represents French computer companies in America. On one corner of his desk he had an original Minitel—the first one, in fact, to be made according to U.S. standards, a real collector's item, with serial number 000009. A couple of his clients have been on the verge of launching their own Minitel services here, but now they're faced with the FCC dilemma.

El Baze was shaking his head disconsolately. "I think it's a shame," he said, referring to the proposed surcharge. "When you see how this works in France, how much people are getting out of it...I can't imagine not having a similar system in the U.S. where people are even more ready to use these types of terminals and services than we are in France."

He gave a Gallic shrug. "The people (continues)"
Introducing MacDisk™
High-performance hard disks from the driving force in the ATworld.

For the serious Macintosh user, there's cause to rejoice. Priam's new MacDisk hard disk drives. A family of totally-integrated, high-performance external SCSI drives that allow you to tap the full power of your Macintosh Plus, SE or II.

And that offer you the ultimate in quality and dependability. How can you be sure? Priam's track record.

Priam has been building premium drives for mainframes, minis, and micros for a decade. Drives distinguished by their exactitude and endurance. Attributes that have made Priam the leading supplier of 40 MByte or larger drives dedicated to the AT.

MacDisk drives possess the same enduring qualities. No wonder then that they're specified for up to 40,000 hours MTBF. They come in 40, 100, or 230 MByte versions with average access times as fast as 20 ms. And they come complete. Ready to boot, ready to get to work.

Another reassuring feature you get with Priam's MacDisk is comprehensive and responsive service and support. Precisely what you'd expect from a company with Priam's credentials.

Ask for Priam's MacDisk at your nearest Apple dealer today. Or for more information, call 1-800-345-9242 ext. 107. In California, (714) 545-2774. In the long run, you'll be glad you did.
THUNDERSCAN IS SO IMPROVED YOU WON'T BELIEVE YOUR EYES.

Ever since ThunderScan started zipping back and forth inside the ImageWriter®, it's been famous for eye-popping graphics. And now, the most popular Macintosh® scanner is better than ever: With exciting new features you won't find on scanners costing ten times as much. True halftone capabilities.

New file formats. Special effects. And more.

ThunderScan halftones are really something to behold. Because ThunderScan returns true gray shade information to the Macintosh. Not just dithered bitmaps like most scanners. So even the most subtle details are captured. And with ThunderScan's sophisticated software palette, you can alter any image to your art's desire.

ThunderScan images can now be saved in a variety of formats, including PostScript® (EPSF), MacDraw™ (PICT) and TIFF. That means complete compatibility with PageMaker® 2.0 and other advanced desktop publishing programs. So you can grace the pages of your publications with honest-to-goodness halftones generated by LaserWriter™. Like the images you see in this ad. And wait 'til you see the output from higher resolution printers like the Linotronic® 100. Incredible!

Especially effective are ThunderScan's special effects. Straight line screens. Rotations. And frames. Plus, we've added a lasso that lets you control the shading of irregular shapes.

We've even made a major hardware improvement. It's called Power Port™. Just plug it in and ThunderScan is Macintosh Plus and SE compatible. With no additional accessories. And, Power Port can power most serial port peripherals.

Yes, the new improved ThunderScan is sure to raise some eyebrows. And its price $249 is definitely a sight for sore...well, you get the picture.
The alternative to markers, typesetting, spray cans, knives, triangles, press type, T-squares, stat cameras, sketch pads, layout pads, tissues, kneaded erasers, proportion scales, black pencils, red pencils, blue pencils, pens, air brushes, compressors, inks, brushes, rubber cement, art board, foam board, and reams of telephone messages from studio reps.

Power users can now create with more graphics power. GraphicWorks™ 1.1 is the first fully-equipped, full-featured, second-generation graphic and text package for the Macintosh™ II, SE, Plus, and 512K.

Add The Desktop Studio™ to your desktop publishing software library. It will make you, what you do, and your bottom line look better.

Mindscape
BLINDINGLY FAST. By sending your print files to the background and returning control of your Mac to you, SuperLaser-Spool lets you work and print at the same time. And it does this 5 to 40 times faster than its nearest competitor.

SuperLaser-Spool gets you back to work fast. You never wait for the printer, no matter how many documents you have queued up or even if the network is busy. SuperLaser-Spool automatically manages the entire printing process while you work.

WORKS WITH ANY APPLE® PRINTER. SuperLaser-Spool can print to the LaserWriter and ImageWriter® (either direct-connect or AppleTalk®-connected).

INCREDIBLY COMPACT. Other spoolers require so much storage space that a hard disk is essential. Not so with SuperLaser-Spool. You can use it with floppy-disk systems because its files are so compact.

DON'T WORRY ABOUT ONGOING(printing) COSTS. Unlike most of its competitors, SuperLaser-Spool can handle files that have multiple downloaded fonts.

EASY TO USE. With SuperLaser-Spool, you can view all the jobs in the print queue, change their priorities, delete jobs, receive on-screen help, and check on network activity. Your spool files are always safe, even if the system crashes.

SuperLaser-Spool works with almost all Macintosh applications. You can even leave and enter different programs without disrupting the printing of documents. And it's completely invisible: You can launch it and forget it's even there.

- SINGLE-USER: $149.95
- MULTI-USER: $395.00

Get SuperLaser-Spool at your local SuperMac dealer today, or order direct.

David Bunnell

who stand to lose the most, of course, are all those people at home who have never used a computer. They're going to suffer even more, but they don't know it yet. There will be so many services they won't be able to access. Or if they are, it will be at such a cost that they won't want to."

Can America afford to fall behind France and other countries—Switzerland and Singapore, to name two—that currently use videotex services? Doesn't it make more sense for the government to stimulate our economy by adopting a laissez-faire attitude toward online access to information services? Just think of what Minitel has done for the French economy. We could be enjoying an economic and electronic boom of our own. It might do wonders for our balance of payments.

I think the FCC should put off its access charges. I'm not insensitive to its problem. But for now, the FCC should think of free access as an investment—an investment in America's high-tech future, as well as in our domestic economy.

So this is David Bunnell's proposal to the FCC: I urge you to delay the imposition of these access charges for online computer use for a period of ten years. Give the telecommunications industry a chance to really develop. I'm not sure that we've come such a long way since the breakup of giant Ma Bell. Looking at my own phone bills over the past few years, I can't see that my long-distance charges have gone down significantly. So what was all that fuss?

On the positive side, the cat's already out of the bag. Hundreds of thousands of home modem users are now using various online services and contributing to the development of online technology. With luck, there's already a critical mass, so that the growth of online use cannot be stunted.

I urge you, and all concerned and potential users, to contact your representatives in Congress. Let them know you oppose the FCC telecom surcharge.

I would also have urged you to send your E-mail to the FCC's electronic bulletin board, but as Ruth Milkman revealed: "Are you kidding? We still have rotary dials and black telephones. Talk about the Stone Age of the information industry!"

It figures.

So write the FCC instead: The Secretary, Federal Communications Commission, 1919 M St. NW, Room 222, Washington, DC 20554.

Give them your opinion. You want to know what mine is? It's "Give 'em the boot, don't pay tribute!"  —
Is your creativity held captive?

Introducing CourseBuilder™
by Bill Appleton

Free your imagination!
CourseBuilder™ is an innovative visual language that enables you to create stand-alone applications for teaching, training and testing. Programming is as easy as drawing a flowchart of your thoughts. Construct simulations, courseware, tests, training packages, guided tours, electronic textbooks and more!

Powerful built-in features
Convey your message with animation, text, graphics, speech and music. Receive input from dialogue boxes, menus, mouse clicks and controls. Combine these features with intelligent branching, user variables and performance files, and now you have everything you need to create state-of-the-art software.

Video Builder also available with laserdisc, VTR and slide projector interface.

Express yourself. Send for a brochure or send $10 for an 800K demo disk. Available only from:

“Realizing the imaginable.”

TeleRobotics®
INTERNATIONAL, INC.

8410 Oak Ridge Highway • Knoxville, TN 37931 (615) 690-5600
Circle 780 on reader service card
How to give your 512, Plus, or SE the hard disk performance of a Macintosh II.

**DataFrame**

highest performance drives.

The new Macintosh II features a disk technology called 1:1 interleaving for highest performance.

The DataFrame XP family of hard drives has delivered that same 1:1 performance, to any Macintosh, for over a year now.

**Who needs faster disk performance?**

Everyone. The faster the disk, the faster the Mac system. Faster program loading, faster operation, faster saves. You work faster, because you wait less. That's why InfoWorld concluded DataFrame's speed "shows just how good the Mac can be."

"... leaves the others in the dust."

InfoWorld compared. After measuring the DataFrame to be significantly faster than the Macintosh SE internal hard drive, they went on to compare DataFrame to the fastest drive they'd seen for any computer. The result: "It left that pony in the dust, too."

InfoWorld's conclusion: "the fastest drive we've tested."

**Loaded with great SuperMac software—including SuperLaserSpool and DiskFit.**

Says MacWorld, "SuperLaserSpool is the most complete and well designed spooler available for the Mac." And DiskFit earned the highest rating MacUser ever awarded a backup program.

**Plus, True Portability.**

The same 1:1 interleave that makes DataFrame so fast also makes it truly portable. Swap it between any Mac II, SE, Plus, or 512—with full Mac II disk performance. No other drive offers this interchangeability.

**No reason to wait!**

Equipped with a DataFrame, your 512, Plus, or SE will outperform Apple's new, hard-drive SE. And your Mac II will perform to its fullest potential.

Visit your SuperMac dealer, and see why over 25,000 DataFrame owners have moved into the fast lane with what MacWorld called the "Porsche among disk drives."

SuperMac Technology
295 N. Bernardo
Mountain View, CA 94043
(415) 964-0884
The Challenge of Chinese Computing

Despite the many different coding schemes used for Chinese characters ["The Polyglot Macintosh," Macworld, May 1987], there is in fact an emerging standard. The USMARC character set, developed by the ICCI in Taiwan, has been adopted by the United States Library of Congress and Department of Defense and is endorsed by the governments of China, the Republic of China (Taiwan), Japan, and Korea.

Also, the number of known Chinese characters is more than 74,000, not 30,000 as mentioned in the article, and the number of frequently used characters is not 3000, but 15,000. There are at least 9177 Chinese characters for last names alone, which must be part of any working system.

One of the major hindrances to developing a Chinese computer is inadequate hardware. The minimum acceptable resolution for a Chinese character is 24 by 24, so a Chinese computer would need a resolution of at least 2048 by 1536 pixels, compared to the Mac’s 512 by 346.

In short, Chinese computing is much more complicated than you described in your otherwise excellent article.

Timothy Huang
International Information, Inc.
Portland, Oregon

Corrections

The Hebrew word processor MouseWrite ["The Polyglot Macintosh," MacWorld, May 1987], also known as Achbar, is available from Davka Corp., 845 N. Michigan Ave. #843, Chicago, IL 60611, 312/944-4070, 800/621-8227.

Mechanical Intelligence, maker of the MI-4 parallel-processing development system for the Mac (Macworld News, June 1987), can be reached at 619/436-1455.

More Mac Language Skills

In addition to French, Spanish, Italian, and German ["The Polyglot Macintosh," Macworld, May 1987], the Mac also "speaks" Portuguese (the tilded à and ô, both upper- and lowercase, are not part of the IBM extended ASCII character set but are and have always been standard on the Mac). Swedish, Norwegian, and Finnish characters also can be generated on the Mac. The Swedish å and the Danish-Norwegian å and ø are listed in the Keyboard Accents chart in the article. Finnish has no characters that differ from those of the German alphabet.

Gabe Bokor, President
Accurapid Translation Services, Inc.
Poughkeepsie, New York

Price-War Patriotism

In Verbatim [May 1987] Ash Jain, vice president of AST Research, stated, "Buying market share by lowering prices is a disservice to the consumer," adding that companies that cut prices might not exist at the end of 1987.

Mr. Jain’s statement is contrary to the free enterprise system, the backbone of the United States. The one who wins in a price war is the consumer. Lower prices are a welcome change from the rates charged by corporate monsters that have enjoyed substantial profit margins since the introduction of the Macintosh. Market forces will eventually push the price of Macintosh-compatible hard disk drives down to where they will be affordable for every Macintosh owner. If AST’s prices don’t come down, it might very well be one of those companies in trouble at the end of 1987.

John M. Altman
Spokane, Washington

Mac Programs for M.D.s

Do you know of any medically related software that can be used on the Macintosh?

Vincent J. Vaccaro, M.D.
Utica, New York

A few user groups, such as the Los Angeles Macintosh Group, have special-interest groups for medical professionals. To find out about user groups near you, call the Apple user-group hotline at 800/538-9696 ext. 500.

One user group specifically for health professionals is Focus, the computer society for doctors. Among other ser-

(continues)
Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. MACWORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want.

Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices. MACWORLD, The Macintosh™ Magazine.

MACWORLD GIVES YOU MORE.
More for less. Honest.

☐ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE. ☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed  ☐ Bill me later

NAME ________________________________

COMPANY ________________________________

TITLE ________________________________

ADDRESS ________________________________

CITY ________________________________ STATE _______ ZIP _______

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.
The Barbecue Brothers would rather bake beans than count them.

It’s only the best chili in the whole doggone state.
But it might not be, if Larry Keenan and Curt Fischer had to spend more time balancing their books and less time balancing their spices.

That’s why they bought In-House Accountant™ from Migent.

With In-House Accountant, the boys spend very little time entering transactions. Or reconciling bank accounts. Instead, the program does it for them. Automatically, and in a very Macintosh™ kind of way.

That means all the information is right there on the desktop, so the guys can see at a glance things like their checking balance, or the amount they spent on hot peppers last month. For payables and receivables, they simply zip among their accounts without ever having to change modules, or even close a window. And when they enter a transaction, all related items in other lists are updated immediately. So there’s never a need for “posting.”

All of which means they have more time to do what they do best: which is make the best chili in the whole doggone state.

In-House Accountant.

See your nearest Migent dealer, or call 1-800-633-3444 for more information.
Macintosh SE. The perfect place to start building—equipped with a built-in 20Mbyte hard disk (or a second internal floppy) and one internal expansion slot.

Plug a card into the SE and make a quick connection with mainframes and networks.

Floor it. In a Macintosh SE, a 68020 accelerator card gives you license to exceed the speed limit.

Add a 5.25" disk drive, and (with the right card) you can use information created on IBM or compatible PCs. Or run MS-DOS programs.

A new keyboard, re-designed for the new generation of Macintosh computers.

In scientific or engineering applications, a special card can connect an SE or a II to lab instruments.

The new AppleColor® High-Resolution RGB monitor can create brilliant hues and true gray scale on your Macintosh II. In finely-detailed 640 x 480 pixel resolution. Also available: a 12" monochrome monitor.

How to build your

You've heard about them. You've read about them. By now, you've probably even seen them.

Our latest leaps in technology, the new Macintosh® SE and Macintosh II personal computers, have been getting their share of press.

But to add to what you may already know, we'd like to tell you more about their most powerful feature: expandability.

It's something we made possible by adding expansion slots. So you can easily customize your Macintosh to meet the demands of any business.

You can, for example, set up a system that's perfect for major-league number crunching. Or add features to give you even greater power for Apple Desktop Publishing, like displays as big as 21 inches.

The SE sports one expansion slot.

While the Macintosh II takes the idea of expansion to the extreme—with six 32-bit NuBus slots. Which have the good sense to configure themselves, and require you to do nothing more than plug in the options of your choice.

Such as an 80286 co-processor card that lets you run programs written for MS-DOS computers. And a video card that produces near-photographic images.
The Macintosh II has a lightning-fast 32-bit Motorola 68020 processor, a 68881 coprocessor and six NuBus expansion slots.

As for storage, there's plenty. With either computer, you get the option of an internal hard disk. Or an external one that can store up to 80 megabytes.

You can also choose between two keyboards. One of which has 15 function keys that come in handy when delving into special applications.

And as you might expect, we've done more than just give you a very good way to build the Macintosh of your dreams.

We've also arranged to make sure you have the perfect workshop: an authorized Apple dealer.

Where you can get some expert assistance choosing your options.

So all you have to do is stop in. And get to work.

The power to be your best.
Letters

vices, Focus offers medical software reports that evaluate Mac software (and software for other computers) based on polls of current users. Membership, which is open to any health professional, is $95 per year. For further information, contact Focus at International Technology Center, 50 Fremont St., 31st Floor; San Francisco, CA 94105, 415/626-4600.—Ed

Where to Share
I'm a new Mac user and therefore naive about certain things. I have read several references to shareware and public domain software. They seem like good ideas, but how do I get them?

Lowell Dietz
Gainesville, Georgia

Public domain software (distributed for free) and shareware (also free, but if you like the program, you’re asked to contribute a small fee to the programmer) are available through user groups and software distribution groups. See the introduction to Macworld’s Where to Buy section for addresses of some major sources.—Ed.

BASIC Disagreement
In Jim Heid’s article “BASIC Choices” [Macworld, May 1987], he wrote, “The debut of BASIC compilers is great news for programmers who prefer BASIC’s versatility to the rigid confines of Pascal and C.”

I program in C most of the time, using Pascal on occasion, and I would not go back to BASIC for anything short of $50,000 a year. With Pascal and C you can create customized menus, customized dialog controls, and many other things that are next to impossible in BASIC without pages of POKE statements. That is not what I would call “rigid confines.”

Alan T. Goates
Salt Lake City, Utah

Too Much Mouse
Has anything been done to circumvent the use of the mouse with the Macintosh? I love the computer, but as I am a very fast typist, it slows me down to remove my hands from the keyboard. I have used the Mac Plus keyboard with the directional keys on the right, but even that necessitates removing my fingers from the keyboard.

Darsh Deane
Roanoke, Virginia

The trend in Macintosh word processing packages is toward more F-key equivalents for menu commands. Some programs, like Microsoft Word 3.0, designate keys for moving around in a document, though with most software it is still necessary to use the directional keys on the Mac Plus keyboard or the mouse.—Ed.

Acta Underestimated
I appreciated seeing my program Acta mentioned in your review of Voila [“Voila! Another Instant Outline,” Macworld, May 1987]. But if a perceptive reviewer could miss one of Acta’s features, some of your readers probably have, too. Here’s how to convert a MacWrite or Word document into an outline with Acta: Select the text in your application and copy it to the Clipboard. Bring the Acta window to the front, hold down the Option key, and select Paste. Acta’s “smart paste” feature works with Clipboard text from any program.

David Dunham
Goleta, California

(continues)
The Photon 20, 30, 40 and 80.
Our best selling products. A 21, 31, 41, or 81Mb external SCSI hard drive.

$569.00
$789.00
$949.00
NEW! $1379.00

Memory Upgrades.
WarpRam—512k to 1Mb—$189.00
DataRam—2Mb upgrade—$259.00
MonsterRam—2.5Mb upgrade. Uses 1 megabit chips—$595.00

Software Products.
LaserSprint—Laser spooler—$59.95
PrintSprint—ImageWriter* spooler—$29.95
FullBack—Hard disk Backup—$39.95
Software Bundles
— LaserSprint/FullBack—$79.95
— PrintSprint/FullBack—$39.95

NEW! for the Mac II.
Introducing Three New Internal Hard drives for the Mac SE.
Buy a Mac SE with two 800k floppies. Then install our internal hard drive in place of one of the 800k floppies. Takes 15 minutes. Gives you a hard drive and a floppy drive for hundreds less than Apple. Features that Apple doesn't offer:
• 4 shock mounts to absorb the bumps of everyday use
• Simple to change SCSI addressing

P20i (20 Mb)—$499.00*
P30i (30Mb)—$649.00*
P45i (45Mb)—$899.00*

*This price includes a rebate of $100.00 if you return the 800k floppy drive to us in our re-packed box. P20i, P30i, and P45i without rebate, $599.00, $749.00, $949.00 respectively

For 512k Owners.
All our hard drives and tape drives work with your 512k. Just add our easy to install Plusport SCSI port adapter. $140.00

Mac Carrying Bags.
MacPlus or SE—$79.00
Imagewriter I or II—$64.00

Phaser 800.
MacWorld called it one of the quietest 800k floppy disk drives. (Nov. 86) Works with 128, 512, MacPlus, and SE.

$189.00

Transporter is a stand alone 20Mb tape drive. The 2001 is a combination 20Mb hard drive/20Mb tape drive. Exceptional tape drives that backup and restore volume, file-by-file and incrementally.

$799.00 $1399.00

EASY ORDERING. FAST DELIVERY.
TOLL FREE numbers:
1-800-654-5294
1-800-328-6795 ext. 433.
In Minnesota: (612) 426-9769.

MAC SE INTERNAL HARD DRIVES
Circle 439 on reader service card
True Stories in Typesetting

"Linotype and Macintosh™ gave us the edge in text and graphics."

Bert Monroy

Weissberg Associates, in New York City, is a growing ad agency which specializes in retail advertising. Bert Monroy, technical consultant, tells how an in-house text and graphics system gives Weissberg a competitive edge.

"In our business, time is of the essence."

"We specialize in retail advertising, where fast turnaround time is an absolute necessity.

"You can have a sale or some kind of special event, it's Tuesday afternoon and you have to have finished material to the newspaper by that Friday so it can run on Sunday. That's a tremendous time constraint and if you use outside suppliers, you have to pay 100% overtime. Small agencies just can't afford to have those kind of costs.

"We needed a faster, more economical way to service our clients."

"We decided to automate our production."

"Weissberg Associates wanted an in-house computer-text-and-graphics system to cut down on production costs and to enhance the quality of their output. I primarily started with Macintosches because of their graphics capabilities.

"Then I had to choose output devices that could produce extraordinary text and graphics, and were still completely compatible with the Macintosches. I knew Linotype had the right equipment available but it had only recently been introduced.

"We purchased the Series 100 equipment including the Postscript™ RIP, the ML-314 Processor and of course the Linotronic 300 laser imagesetters, which can set both text and graphics."

"We got much more than we bargained for."

"Naturally we had high-quality output immediately. But with Linotype's Series 100 system, our artists could cut down on time and materials, too. Before, the artist only prepared the layout, but now he can do his own mechanicals - on screen! He can see the type, play with it, rejustify it - even move it around a million ways if he wants to.

"Our artists create images on the computer and do the work in one to two days at the most, with no outside cost. And if they want to make revisions, it's easy. Everything is internal so we have more control, and cost- and time-savings are phenomenal. And because we can offer lower costs to clients as a result, we have an edge on the competition.

"With in-house output, our clients profit from savings in time, cost and materials, and we come out one step ahead of other agencies. Linotype has helped us bring our production in-house very economically, and that 'one step' has become the foothold for our future growth."

If you'd like to know more about the Linotronic 300, 100 or the Linotronic 500 wide-line (108-pica) laser imagesetters, contact: Linotype Company, 425 Oser Avenue, Hauppauge, NY 11788. Or call (516) 434-2016. In Canada, (416) 890-1809.

And let our quality speak for itself.
If you can hold a pen, you can use a computer. Forget about punching keyboards or chasing a mouse. With the Personal Writer system, all you do is write on paper and your words appear typewritten on screen, instantly!

Whether you want to write text, input figures, or create graphics, you simply pick up your pen and write your computer. Add, delete and correct with the flick of your pen. It even comes with a built-in 100,000 word dictionary that corrects your spelling in a flash.

Personal Writer is the system that's as natural as your signature. And as easy to use. Its powerful character recognition software learns to read your handwriting and makes interaction with your computer a breeze.

Whether your needs are in word processing, spreadsheets, database management, or graphics, the Personal Writer system works for you. Fully compatible with virtually any software on the Mac market, Personal Writer's ease of use will follow you in all your applications. So don't worry about tedious typing. Use the power of your own handwriting.

Call us toll free today for more information at (800) 322-4744 or write us at Anatex Inc., 1801 Avenue of the Stars, Suite 507, Los Angeles, CA 90067. (213) 556-1628. Dealer inquiries invited.

Pen and paper.
Letters

Not Quite Ready for Review
Thank you for reviewing SoftSync's Accountant, Inc. ["Not-Quite-Ready Accounting," Macworld, May 1987]. However, the reviewer's criticism of some aspects of the program comes a bit too late. He reviewed version 1.0, but our current release is version 1.9. Many of the suggestions he made were already made by customers and incorporated in subsequent versions.

Registered users can order upgrades for only $9.50.
Kenneth P. Currier
SoftSync, Inc.
New York, New York

At the time our review was written, version 1.0 was the latest release, but due to space limitations, the printing of the article was delayed. See updates in this issue for more on the new features in Accountant Inc.—Ed.

Digitizing Debate
In her review of clip-art packages ["Art To Go," Macworld, December 1986], Erfert Nielson preferred the pretty and exotic over simpler, digitized clip art. Although the images available in the packages she prefers are fine to look at, they are not practical for my everyday needs.

Ms. Nielson suggests that instead of buying digitized clip art, people should purchase and use a digitizer. She obviously doesn't realize how much time (not to mention talent) the digitizing and clean-up process takes.

Jim Gomez
Denver, Colorado

Programming Mainstay
I was glad to see your review of V.l.P. by Mainstay ["A Very Important Program," Macworld, May 1987]. In your review, however, you cite as a drawback the fact that no literature is available about the program except the manual. Mac Tutor, a Macintosh programming journal, has run at least two articles by Bill Luckie on programming with V.l.P. The first article, which appeared in November 1986, gave a short lesson in general programming with V.l.P., and the April 1987 issue carried an article on programming with C.
Steven Fahl
San Jose, California

Software Hotline
Recently I have become interested in writing COBOL programs for computer systems other than the Macintosh, but I have had little success in locating COBOL software. Can you give me some idea as to the quality and price of the different compilers available and where I can buy them?

James D. Belland
Hershey, Pennsylvania

We can't tell you about the program's quality, but Micro Focus (2465 E. Baysore Rd. #400, Palo Alto, CA 94303, 415/856-4161) sells a COBOL compiler called MacCOBOL for $495.—Ed.

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to ComputerServe 70370, 702 or The Source B/CW440. Include a return address. We reserve the right to edit letters. All published letters become the property of Macworld.
FINALLY, A $2600 LASER PRINTER THAT PRINTS LIKE A $5000 LASER PRINTER.
WHICH WAS PRINTED ON A $5000 LASER PRINTER? WHICH ON OURS FOR $2600?

To the thousands of Macintosh users who find themselves wishing there was a personal printer that lived up to their personal computer.

Including the executives, entrepreneurs, academics and other professionals looking for an affordable entree into the world of desktop publishing.

INTRODUCING THE PERSONAL LASERPRINTER.

As the documents shown here demonstrate, the General Computer Personal LaserPrinter (PLP™) concedes nothing in printing capability to systems that sell for twice its price.

General Computer presents the reassuring paradox illustrated on these pages: the first affordable laser printer that prints like it costs thousands more.

Avoiding Wall Street's blind alleys: A Prudent Investor Special Report. See p. 9

If that still seems hard to believe, consider this. Until now, anyone who bought a laser printer was also buying a computer. Because laser printers have always needed a processor, memory and other expensive hardware to create a printable page.

Our laser printer, on the other hand, eliminates much of this expensive hardware in favor of ingenious software.

Software that allows the printer's imaging to be performed by the computer you already own: the Macintosh. (Either the 512E Macintosh with optional RAM cartridge, Mac...
There are probably no better hedge against inflation. Gold is the internationally recognized medium of exchange. It's completely portable. And, unlike paper money, it has inherent value. But is it for you?

In times of economic or political turmoil people turn again and again to gold.

That's what makes gold prices go up in times of inflation. And why gold moves up when world peace is threatened.

As an investor, you have five basic ways to purchase gold.

1. Gold futures, like all futures contracts, are basically closed-ended speculation intended for sophisticated traders.
2. Gold stocks. Shares in mines are traded on all major exchanges. Some, especially South African mines shares, pay substantial dividends. (This is due to the volatile political situation there.)
3. Gold bullion can be bought at all large brokerage houses. These firms also store and insulate bullion.

The Rising Fortunes of the Humble Apple

Consumer demand has mushroomed in recent months for fresh fruit and produce. What are the best plays in this trend for investors?

Dr. Vic Scialliene, of the Washington State Department of Agriculture says continued on page 3

The Personal Laser Printer price tag.

A Personal Laser Printer

We invite you to make your own comparisons through a PLP demonstration at any authorized General Computer dealer. Where you'll also be able to compare another pair of documents that are far easier to tell apart: A Personal Laser Printer price tag. And that of any other laser printer of equal quality.

For the name of the dealer nearest you, call (800) 634-9737.

AN INVITATION TO SKEPTICS.

In other words, the PLP does for printed communications what the Macintosh did for personal computing.

It provides a sophisticated, yet affordable tool for anyone who needs to manage large amounts of information—and wants to work smarter and more creatively in the process.

So to answer the question we began with: the PLP printed the document that appears on the right. But you don't have to take our word for it.

We invite you to make your own comparisons through a PLP demonstration at any authorized General Computer dealer. Where you'll also be able to compare another pair of documents that are far easier to tell apart: A Personal Laser Printer price tag. And that of any other laser printer of equal quality.

For the name of the dealer nearest you, call (800) 634-9737.

Picking Your Stockbroker

Continued on page 5

for editing and revision by others.

Then, once all the revisions are complete, the PLP quietly provides extraordinary finished output.

Near-typeset quality presentations, newsletters, memos and reports produced with software like Microsoft's Word and Aldus' PageMaker. All printed with a new generation of laser technology that turns out richer contrasts than ever before.

THE PROOF IS IN THE PRINTING.

As you can see, a case could easily be made for buying the PLP on economics alone. But that would be selling it short.

Because the ultimate measure of any printer is how well it prints.

Like vastly more expensive laser printers, the PLP allows you to print scanned photos and illustrations, high-resolution graphics created with software like MacDraw®and Microsoft's Excel, and otherwise juggle words and pictures until you have them exactly where you want them.

But it also provides assistance even these vastly more expensive printers don't.

Including a choice of Bitstream® fonts limited only by your hard disk's capacity to store them. (Fonts you can easily adjust to any point size, or fraction thereof)

A preview feature that lets you review each page before you print it.

And a draft mode that lets you rapidly print out works-in-progress.
The hottest sport on a court — the hottest game a Macintosh™ can handle.

Even if you’ve never been on a racquetball court, you’ll spark to the excitement of this challenging simulation.

MacRacquetball turns your Macintosh screen into a full perspective 3-D display of court, players and ball. With the mouse, you have complete control of player position, ball placement, ball speed and shots. Two people can play the same game over AppleTalk® or modem.

Superb graphics give MacRacquetball completely convincing realism. There are more than 1000 frames of ultra high speed digitized animation. It’s one racquetball court that’s always open when you’re ready to play.

Enthusiastic players everywhere have made MacGolf the best selling Macintosh game ever.

MacGolf puts you in the picture, a full perspective 3-D simulation of realistic golf action. You match your skills against fairways, roughs, bunkers, water hazards, sand traps and trees.

MacGolf gives you a player’s eye view of the course, in any direction, and an aerial overview of each hole. You have complete control of your position, ball placement, ball speed and direction, and selection of all 14 clubs. Digitized graphics and sounds add to the excitement.

MacGolf is so close to the real thing it will improve your golf game. And by the time you’ve reached the eighteenth hole you’ll know you’ve been in a real contest.

When you have the best selling Macintosh game in the world, what do you do for an encore?

Here’s new turf for adventurous MacGolfers. These are courses to conquer for mouse wielding pros who have taken the measure of the original MacGolf courses.

If you liked MacGolf, you’ll love what MacCourses brings to the screen. Four new 18 hole, par 72 courses: Cedar Creek, Golden Sands, Thunder Ridge and PCAI International. The fairways, traps, hazards, and putting greens of MacCourses are in a whole new league.

If you thought MacGolf was good training for the outdoor game, MacCourses should turn you into a pro. Get MacCourses now, use it when you’re ready — you never know when you’ll need the challenge.
Early this summer Macworld sponsored a conference for members of the technical community—designers and developers who work with Macintosh computers. In two and a half days of meetings, the Technology and Issues conference shed light on forthcoming products and pointed the way for Macintosh developments in the near future.

Not surprisingly, discussions of technology are always colored by market activity: companies bought and sold, new companies emerging, older ones fading. Much as I would like to have it remain a personal computer company, Apple is evolving into a supplier of personal computers for business. Similarly, companies that have developed products for the Macintosh are becoming more important on a national scale. Aldus, Microsoft, Adobe, and others have become public companies, subject to the scrutiny of the SEC and no longer able to pursue products just because they represent interesting directions for technology. We can have hope, however. There's still a spark of innovation in Cupertino that may prevent the company from becoming like Burroughs or Digital Equipment Corporation—companies that are successful but not likely to change the course of humankind.

Our conference covered the areas of communications, graphics, programming, hardware, and system software. System software raised the most interesting issues—including discussions both of Juggler [MultiFinder at press time] and of System 6.0 (for lack of a better name). Juggler, introduced formally in Boston at the August Macworld Expo, is Apple's first step toward multitasking and multiprocessor on the Macintosh. Often compared to Andy Hertzfeld's Switcher, Juggler should stand on its own as a slightly flawed but very impressive first effort at a multitasking operating system. Juggler's first use will most likely be allowing us to print in the background while continuing to use another application. Communications will be another early use; we'll be able to transmit documents without leaving an application.

System 6.0 was not explicitly discussed. Rather, one of the sessions at the conference focused on a proposed "electronic document architecture," the blueprint for some future so-called compound document architecture. EDA has already become the focus of a working group of Apple engineers and third-party developers; the group will explore standards to allow future Macintoshes to support documents that contain sound, text, graphics, and animation. IBM, Xerox, and Hewlett-Packard all have their own proposals for such architectures, but Apple is unique in having the ability to actually put one in place.

Three sessions covered computer graphics. In one, several developers showed programs that are among the first to take advantage of the Mac II's color; Cricket Software's Jim Rafferty demonstrated a color presentation package that outputs to color printers and cameras; MacroMind's Marc Canter showed VideoWorks II's new sound and animation capabilities. Apple technical staff members Ernie Beernink and Galyn Sussman demonstrated features of the Mac II's color manager and palette manager—new features in the ROM for color mapping—and discussed alternatives for color palettes.

The next-generation color video card from Apple is under design; Toby Farrand, Apple's graphics hardware doyen, chaired a discussion about the problems with speed-up QuickDraw. The present graphics card, although far ahead of similar cards from IBM, still needs improvement if Apple is to stay ahead in the graphics realm. Ani-

(continues)
With its powerful curve drawing capabilities, Adobe Illustrator makes short work of the most technical drawings. And gives you camera ready output right at your desk.

Share your drawing with other users. And if anyone wants to change it—no problem—the Adobe Illustrator can give you another perfect original. Fast.

Start with a blueprint or just a dream and the Adobe Illustrator can help you build out the rest. Straight and true.

For producing the finest details, all kinds of line weights, even typeset captions with precise control, no other program can touch it.
Unlike other draw and paint programs, the Adobe Illustrator uses lines and curves to form an image instead of dots. So there's really no limit to the ideas you can hatch. Or cross-hatch.

NOW A WORK OF ART DOESN'T HAVE TO BE A LOT OF WORK.

Introducing Adobe Illustrator*
A new software program designed to produce high quality illustration with the smoothness of a french curve, the versatility of a pencil and the speed of a computer.
Here's how it works.

Unlike other programs, the Adobe Illustrator doesn't build an illustration dot by dot. It uses precise lines and curves instead.
Secondly, nothing has to be drawn from scratch. You and your Macintosh Plus, SE or II, can start with the scanned image of a photograph, logotype, blueprint, something from your scrap file, even a rough sketch.
Once in the computer, this scanned image becomes your guide. You trace over it to construct the new image. Then, once you have the image you want, you can manipulate it in ways possible only with a computer—scale it, rotate it, even combine it with other Adobe Illustrator images.
From an artistic point of view, then, the Adobe Illustrator is a powerful, new medium.
But it's also a powerful new production tool. One that automates the art production process.
Imagine, if you will, getting camera ready art out of a Macintosh. (We did. You're looking at it.)
Or being able to change that art radically—as easily as you'd edit a letter—and getting new art, literally, within minutes.
Imagine keeping every image in small electronic “art files” and being able to recall, refine, combine or change images, at any time, in any way.
Without any of the usual production headaches.
And just picture what you can do when you combine the Adobe Illustrator with the most popular page layout systems.
It also drives each and every PostScript® equipped printer, from the Apple® LaserWriter® to Linotype's® Linotronic® 300 typesetter.
So the problem of getting high resolution has finally been resolved.
To see for yourself, call (800) 29-ADOBE, (800) 85-ADOBE in California, or (415) 852-0271 from Canada for the location of the nearest Adobe dealer. You'll get a demonstration that'll really draw your interest.

ADOBE ILLUSTRATOR®
Adobe Illustrator is a trademark and PostScript® is a registered trademark of Adobe Systems Incorporated. Other brand or product names are trademarks or registered trademarks of their respective holders. ©1987 Adobe Systems Incorporated. 1870 Embarcadero Rd., Palo Alto, CA 94303.

Circle 678 on reader service card
Many Macintosh owners already know us; but if we are a new name to you, let us introduce ourselves. Icon Review is a consumer-direct marketing company that specializes in quality hardware, software, and accessories for the Apple Macintosh. We have built our reputation as a reliable and friendly supplier of the latest and best Mac-related products.

Put Icon Review to work for you and take advantage of our extensive research of the Mac marketplace. Each and every product we carry is evaluated for quality and value, then offered at the lowest possible discount price. Pick up the phone and order today. You'll be glad you did!

800/228-8910 Good anywhere in U.S.
Software is expensive. So why take chances? Choose from our vast Mac Library and TRY IT FIRST. Join our thousands of satisfied customers...just call us and tell us what you want. We'll treat you like family.

## SOFTWARE FOR RENT

Over 800 Titles Available Including:

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient Art of War</td>
<td>8.99</td>
</tr>
<tr>
<td>BPI Entry Series</td>
<td>32.38</td>
</tr>
<tr>
<td>Flight Simulator</td>
<td>8.99</td>
</tr>
<tr>
<td>Guide</td>
<td>17.81</td>
</tr>
<tr>
<td>HFS Backup</td>
<td>8.99</td>
</tr>
<tr>
<td>Japanese Clip Art 1 or 2</td>
<td>12.99</td>
</tr>
<tr>
<td>KidsTime</td>
<td>8.99</td>
</tr>
<tr>
<td>LaserWriter Fonts</td>
<td>Call</td>
</tr>
<tr>
<td>Lightspeed C</td>
<td>26.25</td>
</tr>
<tr>
<td>M.U.D.</td>
<td>8.99</td>
</tr>
<tr>
<td>Mac3D</td>
<td>33.62</td>
</tr>
<tr>
<td>MacDraw</td>
<td>35.50</td>
</tr>
<tr>
<td>MacDraft</td>
<td>33.75</td>
</tr>
<tr>
<td>Macintosh 68000 DS</td>
<td>31.50</td>
</tr>
<tr>
<td>MacMemories Series</td>
<td>51.00</td>
</tr>
<tr>
<td>Microsoft (complete line)</td>
<td>Call</td>
</tr>
<tr>
<td>Multilier Helix</td>
<td>95.50</td>
</tr>
<tr>
<td>PowerMath 2.0</td>
<td>13.79</td>
</tr>
<tr>
<td>Profit Stalker II</td>
<td>39.60</td>
</tr>
<tr>
<td>Ragtime 1.1</td>
<td>53.72</td>
</tr>
<tr>
<td>Ready.Set.Go! 3.0</td>
<td>51.25</td>
</tr>
<tr>
<td>Scoop</td>
<td>74.25</td>
</tr>
<tr>
<td>Stepping Out</td>
<td>12.54</td>
</tr>
<tr>
<td>SuperPaint</td>
<td>15.07</td>
</tr>
<tr>
<td>Thunderscan</td>
<td>36.00</td>
</tr>
<tr>
<td>TopDesk</td>
<td>8.99</td>
</tr>
<tr>
<td>World Class Fonts 1 or 2</td>
<td>8.99</td>
</tr>
<tr>
<td>Write Now</td>
<td>22.73</td>
</tr>
<tr>
<td>100's More...Just Call &amp; Ask!</td>
<td></td>
</tr>
</tbody>
</table>

## SUPER SALE

Roadline 20MB SCSI Drive...719.
Panasonic/Mac Printer...265.
Sony Disk...$1.05/DS/1.58
Ribbons/2.65...MultiColor/10.95
PowerMath 2.0....63.44
MacOpenertm (tool)...14.36
55% Off All RealData Titles

## TRY IT FIRST

RENTAL APPLIES TO PURCHASE

Orders Only

1-800-847-5775
(713) 529-1100

SOFTWARE LIBRARY
P.O. Box 980359 • Houston, TX 77098
IBM Library Coming Soon!

(continues)
Create and produce your own transparencies, flip charts, and audience handouts with PowerPoint. Exciting presentations — from start to finish! Works w/512K, Mac Plus, SE & II

$219

NEW

1013 Electric Checkbook $ 29
1757 FactFinder $ 29
1691 FedIt $ 39
1644 FileMaker Plus $ 159
2049 Findswell $ 39
1810 Fluent Fonts $ 29
2203 Fluent Laser Fonts EACH $ 49
1403 FullPaint $ 49
1890 Geometry SPECIAL $ 64
1705 Gue $ 49
1865 GraphicWorks $ 69
1629 Hard Disk Backup $ 39
1778 Hard Disk Partition $ 39
1295 Hard Disk Utility $ 57
1201 Helix 2.0 SPECIAL $ 99
1459 + Double Helix $ 279
1790 + MultiUser Helix SPECIAL $ 445
1678 HFS Backup from PCFC $ 29
1592 HFS Locator Plus $ 27
1987 Illustrator NEW $ 39
1055 In-House Accountant NEW $ 119
1799 Japanese Clip Art/Scroll 1 $ 69
1800 Japanese Clip Art/Scroll II $ 69
2200 Laser Author NEW $ 129
165 LaserPaint $ 349
1707 LaserServe (per user) $ 64
1894 LaserSpeed $ 69
1895 + LaserSpeed/MultiUser SPECIAL $ 79
1686 LaserPrint SPECIAL $ 79
1581 LightspeedC $ 129
1278 Lightspeed Pascal $ 89
2074 MacAtlas NEW $ 129
1818 MacBillboard $ 24
1905 MacCalc NEW $ 85

NEW

800/228-8910
Good anywhere in U.S.

1082 MacDraft 1.2 SPECIAL $ 159
1692 MacFill-In SPECIAL $ 21
1199 MacForms SPECIAL $ 42
1918 MacGraphics SPECIAL $ 149
2047 MachInUse $ 55
1023 MacLabeler $ 29
1833 MacMoney SPECIAL $ 40
1688 MacMovies SPECIAL $ 69
1710 MacProof 2.0 SPECIAL $ 59
1695 Mac3D $ 129
1105 Mac Zap SPECIAL $ 39
1956 MapMaker NEW $ 169
1397 Micro Planner Plus SPECIAL $ 299
1200 MindWrite $ 189
1819 MockPackage Plus SPECIAL $ 24
1641 MORE 1.1 SPECIAL $ 159
Notes... EACH $ 42

2051 101 Macros for Excel NEW $ 59
1036 OverVUE 2.0 $ 149
1478 + Mail Manager SPECIAL $ 29
1477 + Personal Finance SPECIAL $ 29
1490 Picturelate $ 45
2068 PowerPoint NEW $ 219
1215 Print Shop SPECIAL $ 37
1505 Printworks $ 49
1254 Prof. Bibliographies $ 199
1658 Pro3D SPECIAL $ 199
Rags to Riches
We carry all Rags to Riches accounting modules:

1728 Ragtime SPECIAL $ 239
1978 RAM Snap SPECIAL $ 33
763 ReadySetGo! 3 Call $ 49
1606 Reflexity Plus NEW $ 189
2083 ResumeWriter SPECIAL $ 28
1863 SideKick 2.0 SPECIAL $ 59
1488 Silicon Press $ 42
1465 Smart Alarms $ 39
1857 SmallScript & The Clipper SPECIAL $ 39
1367 Spellswell $ 54
2050 + Legal Dictionary SPECIAL $ 29
1936 + Medical Dictionary SPECIAL $ 29

Business Simulator places you in real-life business situations without the risk! Have fun learning important decision-making skills. Works w/512K/2nd drive, Mac Plus, SE & II

$69

1060 StatWorks 1.3 $ 75
1849 Stella for Business SPECIAL $ 259
1937 Stepping Out SPECIAL $ 59
SuperMac $ 49
1912 + DiskFit $ 249
2048 + Network DiskFit NEW $ 279
2069 + Sentinel SPECIAL $ 109
1811 + Super LaserSpool SPECIAL $ 99
1938 + Super LaserSpool/Multi SPECIAL $ 259
1310 + SuperSpool SPECIAL $ 49
1729 SuperPaint SPECIAL $ 53
1307 Tempo SPECIAL $ 53
1804 Thunder 1.1 SPECIAL $ 199
1432 TopDesk $ 35
1847 Trapeze SPECIAL $ 159
1487 TurboCharger SPECIAL $ 39
1840 Turbo Maccountant SPECIAL $ 269
1721 Turbo Pascal SPECIAL $ 59
1047Typing Made Easy SPECIAL $ 53
2091 VLS Bulk Mailing SPECIAL $ 129
1377 WillWrite SPECIAL $ 32
1480 WordTools SPECIAL $ 55
1839 WorksPlus Spell SPECIAL $ 42
1694 WriteNow SPECIAL $ 159

The Compact 540 Hard Drive is designed for portability and engineered to resist shock under all conditions. This unique 40-mg drive is perfect for carrying from pb to pb. Plugs into SCSI port comes w/ 1-yr. warranty

1970 + From CMS

$1,099

EDUCATION/GAMES

2052 Business Simulator NEW $ 69
1761 Dark Castle $ 28
1888 Dinner at 8 Bundle SPECIAL $ 49
2054 First Byte Games $ 36
We carry all First Byte programs; call to order
1559 Flight Simulator $ 35
1473 KidsTime $ 29
1652 MacGolf SPECIAL $ 36
1367 MacKids Games SPECIAL $ 59
We carry all MacKids programs; call to order
1233 Math Blaster SPECIAL $ 39
1869 Smash Hit Racquetball SPECIAL $ 18

COMMUNICATIONS

1460 CompuServe Sub. Kit $ 23
1801 Courier Moderns FROM $ 219
We carry all Courier moderns; call to order
2053 EMAC 2400 Modern NEW $ 269
Hayes
We carry all Hayes products; call to order
1437 InBox Starter Kit SPECIAL $ 249
1593 + InBox PersonalConnection SPECIAL $ 99
1973 InTalk NEW $ 159
1322 MacEnhancer SPECIAL $ 175
1731 MacLink Plus w/8' Cable SPECIAL $ 159
1396 MacServe (per server) SPECIAL $ 169

Anyone who needs to create outlines, manage schedules, or transform ideas into presentation graphics will benefit from MORE. Works w/512K or Mac Plus & 2nd drive, or SE

1641 + From Living Videotext

$159

NEW

SPECIAL

2046 MicroPhone 1.1 NEW $ 119
2006 Midget Pocket Modem NEW $ 189
2093 Modular Cable Kit $ 99
1000 /phone cable /20 connectors & crimp tool for dbc-journal networks
1740 • For Mac Plus, SE & II $ 49
1759 • For 128 & 512K/II $ 49
1765 • AppleTalk Adapter $ 8

HARDWARE

1902 AST TurboScan SPECIAL $1649
2003 Datascopy Scanner 730 NEW $1589
2004 • Software & Interface NEW $ 599
2093 • Document Feeder NEW $ 459
Dove Computer Corp.
We carry MacSnap Memory Upgrades, including the new 8S for the SE; call for prices—we have the lowest!
2055 Enhanced MacCharlile NEW $ Call
2076 Dual Drive 40K
2052 Business Simulator
Kurta Graphics Tablets ON SALE
3402 • Cordless 4-Button Cursur SPECIAL $ 69
1994 • Cordless 4-Button Cursur SPECIAL $ 109
1945 • Cordless Pen SPECIAL $ 109
Both works w/ 800 One & 16 Pinphone
1452 MacBuffer/256K $ 249
1451 MacBuffer/512K $ 329
1459 MacBuffer/1024K $ 429
1476 MacTablet (6 x 9) $ 329
**MegaScreen's 19.5" high-resolution monitors are ideal for page-layout, graphics, and spreadsheets. Installation by qualified technician recommended from MicroGraphic Images**

Attention Excel users! A time-saver for

The MacBottom 21 SCSI Drive delivers reliability, speed, and compatibility. A proven winner—fully equipped with print spooling, backup, and locator software! Compatible with Mac's postscript printers, and works with Books, Word, and databases. A proven winner.

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AnthroCart NEW</td>
<td>$249</td>
</tr>
<tr>
<td>Slide-out Shelf NEW</td>
<td>$89</td>
</tr>
<tr>
<td>Storage Basket NEW</td>
<td>$53</td>
</tr>
<tr>
<td>Side Car Printer Stand NEW</td>
<td>$33</td>
</tr>
<tr>
<td>Backup Cassette</td>
<td>$28-28</td>
</tr>
<tr>
<td>How to Write Mac Software</td>
<td>$24</td>
</tr>
<tr>
<td>Mac Access</td>
<td>$19</td>
</tr>
<tr>
<td>Macintosh Advisor</td>
<td>$15</td>
</tr>
<tr>
<td>Macintosh Bible</td>
<td>$16</td>
</tr>
<tr>
<td>Personal Publishing</td>
<td>$21</td>
</tr>
<tr>
<td>Cables</td>
<td>$35-40</td>
</tr>
<tr>
<td>Carrying Cases</td>
<td></td>
</tr>
<tr>
<td>For ImageWriter I &amp; II</td>
<td>$69</td>
</tr>
<tr>
<td>For Mac &amp; Mac Plus</td>
<td>$89</td>
</tr>
<tr>
<td>Computer Accessories</td>
<td></td>
</tr>
<tr>
<td>Power Director</td>
<td>$66</td>
</tr>
<tr>
<td>PowerLine One</td>
<td>$9</td>
</tr>
<tr>
<td>PowerLine Six</td>
<td>$33</td>
</tr>
<tr>
<td>PowerLine Strip</td>
<td>$39</td>
</tr>
<tr>
<td>Desktop</td>
<td>$12</td>
</tr>
<tr>
<td>Desktop/Wide</td>
<td>$19</td>
</tr>
<tr>
<td>SpaceSaver</td>
<td>$28</td>
</tr>
<tr>
<td>Curtis Surge Suppressors</td>
<td></td>
</tr>
<tr>
<td>Diamond</td>
<td>$28</td>
</tr>
<tr>
<td>Emerald</td>
<td>$34</td>
</tr>
</tbody>
</table>

**DISK DRIVES**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-meg Drive</td>
<td>$49</td>
</tr>
<tr>
<td>10-10 SCSI Dual Drive</td>
<td>$157</td>
</tr>
<tr>
<td>20-20 SCSI Dual Drive</td>
<td>$185</td>
</tr>
<tr>
<td>Bernoulli Boxes</td>
<td></td>
</tr>
<tr>
<td>Cams NEW</td>
<td></td>
</tr>
<tr>
<td>SC 20 SCSI</td>
<td>$589</td>
</tr>
<tr>
<td>540 SCSI</td>
<td>$1099</td>
</tr>
<tr>
<td>MacStack SD20 SCSI</td>
<td>$619</td>
</tr>
<tr>
<td>MacStack SD40 SCSI</td>
<td>$959</td>
</tr>
<tr>
<td>Pro 40 SE Internal Drive</td>
<td>$1059</td>
</tr>
<tr>
<td>SE Internal Cabinet Kit</td>
<td>$149</td>
</tr>
<tr>
<td>S-140</td>
<td>$2790</td>
</tr>
<tr>
<td>S-240</td>
<td>$3995</td>
</tr>
<tr>
<td>S-320</td>
<td>$5295</td>
</tr>
<tr>
<td>800K Drive</td>
<td>$189</td>
</tr>
</tbody>
</table>

**DISKETTES**

Prices and availability are subject to change without notice.

**NOTE:** These prices do not include shipping/handling charges; please call for rates.

You will never outgrow VLS Bulk Mailer. Easy to use and powerful enough to handle 1 million records, VLS Bulk Mailer organizes your mail list in a snap. Works with Macs, Mac Plus, SE & II

800/228-8910 Good anywhere in U.S.
FREE Catalog
To receive yours and advance notice of special sales, call
800/228-8910

Mac 101 Keyboard
From DataDesk Int'l.

The new Mac 101 Keyboard makes it easy to customize all your programs to work more efficiently. Designed for comfort and improved performance, the Mac 101 is fully equipped with a macro-creating desk accessory that allows you to assign menu items, program functions, and mouse movements to the 15 user-definable function keys.

Improve your typing speed and accuracy with extra-large Return and Shift keys, easy-access Cursor keys, a dedicated Cancel key, and numeric keypad. Upgrade your Mac today!

$169

Put a lid on unwanted printer noise with Kensington's Printer Mufflers!

Printer Mufflers
From Kensington

Kensington believes that printers should be seen but not heard. These sound-absorbing foam mufflers are lined with transparent, light-blocking lids to reduce the dust and noise in rooms where printers are used. These foam mufflers do double-duty as an attractive screen. The perfect solution to the problem of noisy printers!

$39

Orders
Icon Review
800/228-8910

Monday thru Friday 6 am to 7 pm
Saturdays 8 am to 4 pm (Pacific Time)
408/625-0465

GUARANTEE: All products shipped by Icon Review are new and guaranteed by the manufacturer to work. All defective merchandise will be repaired or replaced by the manufacturer. Icon Review cannot guarantee machine or color compatibility. Please select your merchandise carefully.

TECHNICAL SUPPORT: Need more information? Icon Review maintains a technical support team for your convenience. Call (408) 625-0465 if you need help — before or after ordering.

CHANGES & CANCELLATIONS: You may change or cancel your order at any time prior to shipment. Subject to availability, orders are usually shipped within 48 hours; priority orders are shipped the same day if received before 2 p.m. PST.

RETURNS: All returns require a Returned Merchandise Authorization (RMA). Contact Icon Review within 10 days of delivery to receive your RMA. All returns must be complete, including all original warranties, manuals, documentation, and packaging. Please include a copy of your invoice or packing slip and a description of the problem. Due to software copyright laws, all sales are final.

SHIPPING & HANDLING: A shipping and handling charge will be added to your order.

Domestic Service - 48 States & Canada
We will ship your products by UPS or US Mail Surface unless you specify otherwise; Second Day Air Service to Hawaii, Puerto Rico, Alaska; Priority Next-Day Air Service, be sure to have our salesperson check stock. Priority backorders are shipped Second-Day Air.

International Service
We serve most European locations (served by UPS) — including U.K., Scandinavia, France, Italy, Germany & Japan — $5.00 minimum shipping & handling charge or 21% of the total purchase price, whichever is greater. We also serve Africa, Australia, Spain, Portugal, Mexico, South America, Philippines, etc. — write or phone for rates.

All prices, specifications, and availability subject to change without notice.

Macintosh is a trademark licensed to Apple Computer, Inc.
Icon Review, 9570 Mid Valley Center, Carmel, CA 93923 © 1987 Icon Review

$39

Mac 101 Keyboard

From DataDesk Int'l.

The new Mac 101 Keyboard makes it easy to customize all your programs to work more efficiently. Designed for comfort and improved performance, the Mac 101 is fully equipped with a macro-creating desk accessory that allows you to assign menu items, program functions, and mouse movements to the 15 user-definable function keys.

Improve your typing speed and accuracy with extra-large Return and Shift keys, easy-access Cursor keys, a dedicated Cancel key, and numeric keypad. Upgrade your Mac today!

$169

Put a lid on unwanted printer noise with Kensington's Printer Mufflers!

Printer Mufflers
From Kensington

Kensington believes that printers should be seen but not heard. These sound-absorbing foam mufflers are lined with transparent, light-blocking lids to reduce the dust and noise in rooms where printers are used. These foam mufflers do double-duty as an attractive screen. The perfect solution to the problem of noisy printers!

$39

Orders
Icon Review
800/228-8910

Monday thru Friday 6 am to 7 pm
Saturdays 8 am to 4 pm (Pacific Time)
408/625-0465

GUARANTEE: All products shipped by Icon Review are new and guaranteed by the manufacturer to work. All defective merchandise will be repaired or replaced by the manufacturer. Icon Review cannot guarantee machine or color compatibility. Please select your merchandise carefully.

TECHNICAL SUPPORT: Need more information? Icon Review maintains a technical support team for your convenience. Call (408) 625-0465 if you need help — before or after ordering.

CHANGES & CANCELLATIONS: You may change or cancel your order at any time prior to shipment. Subject to availability, orders are usually shipped within 48 hours; priority orders are shipped the same day if received before 2 p.m. PST.

RETURNS: All returns require a Returned Merchandise Authorization (RMA). Contact Icon Review within 10 days of delivery to receive your RMA. All returns must be complete, including all original warranties, manuals, documentation, and packaging. Please include a copy of your invoice or packing slip and a description of the problem. Due to software copyright laws, all sales are final.

SHIPPING & HANDLING: A shipping and handling charge will be added to your order.

Domestic Service - 48 States & Canada
We will ship your products by UPS or US Mail Surface unless you specify otherwise; Second Day Air Service to Hawaii, Puerto Rico, Alaska; Priority Next-Day Air Service, be sure to have our salesperson check stock. Priority backorders are shipped Second-Day Air.

International Service
We serve most European locations (served by UPS) — including U.K., Scandinavia, France, Italy, Germany & Japan — $5.00 minimum shipping & handling charge or 21% of the total purchase price, whichever is greater. We also serve Africa, Australia, Spain, Portugal, Mexico, South America, Philippines, etc. — write or phone for rates.

All prices, specifications, and availability subject to change without notice.

Macintosh is a trademark licensed to Apple Computer, Inc.
Icon Review, 9570 Mid Valley Center, Carmel, CA 93923 © 1987 Icon Review

$39
What You See Is What You Get

Subscribe Now and Save 40%

Become a Charter Publish! Subscriber and Here's What You'll Get—

Reviews—The largest selection of software and hardware product reviews available in any desktop publishing magazine.

Product News—Information on the latest technology for all your desktop publishing applications. Hundreds of new product listings.

Solutions—Step-by-step instructions that find answers to all your publishing needs.

Applications—Tips on the fundamentals of graphic design and publishing basics.

Design Features—Well known designers provide creative ideas and concepts for page makeovers.

All this and more is yours in Publish! every month when you subscribe today at the Special Low Charter Subscription Rate.
Presenting MultiTalk™ from Abaton.

Very few peripherals today, other than the Apple® LaserWriter®, can be shared by Macintosh™ users over an AppleTalk network. Which means higher-priced devices—such as modems, scanners, plotters, daisywheel printers and more—are limited to use by one person.

So companies often don’t invest in them.

But what if these devices could be shared by more people? Suddenly, they become truly cost-effective options.

Now there’s MultiTalk. So these devices can start “AppleTalking.”

MultiTalk is a simple concept—the first of its kind. It takes serial devices that don’t normally function over AppleTalk and makes them accessible to every user on the network.

MultiTalk is easy to set up. Just plug it into AppleTalk—anywhere you like—then connect up to three serial devices.

It’s also easy to use. In fact, if you’re familiar with Macintosh, you already know how to use MultiTalk. Simply run the application you need, then select the device you want to use from the available choices: modem, scanner, plotter, etc.

That’s it. MultiTalk does the rest—transparently.

And you can attach up to four MultiTalks to each AppleTalk network. Which means up to twelve devices can be at your “point & click.”

Extend the flexibility of your peripherals and your AppleTalk network today by visiting your authorized Apple dealer or by calling Abaton at (415) 463-8822.

We’ll show you how to make the most effective use of your resources. And how to make ends meet.

Abaton Technology Corporation

7901 Stoneridge Drive 1185 West Georgia Ste. 920
Pleasanton, CA 94566 Vancouver, B.C. V6E-4E6
(415) 463-8822 CANADA (604) 685-7343

Circle 622 on reader service card

Apple, LaserWriter and AppleTalk are registered trademarks and Macintosh is a trademark of Apple Computer, Inc.
NOT JUST ANOTHER NEW FONT, BUT A WHOLE NEW CONCEPT!

Laser FX is one of the most powerful utility programs to be produced for the new desktop publishing industry. It allows both the novice and the experienced user the flexibility of design never before possible in the new microcomputer marketplace (no programming knowledge is necessary). Simply take any PostScript™ font and use any of the 30 effects to create a dazzling typographical masterpiece. You can print directly from Laser FX or paste directly into Quark XPress™, Ready, Set, Go!™, PageMaker 2.0™, Microsoft Word 3.0™, or most other popular desktop publishing packages. Laser FX has the ability to read PICT files or paint files created in other programs such as MacDraw™ or MacPaint™. This allows you to add special typographical effects to your pictures. The uses for this one-of-a-kind program are limitless (limited only by your imagination). Any desktop publishing task can be greatly enhanced with Laser FX. It can be used for creating special effects in newsletters, for designing logos with only a minimum of effort, or adding that extra pizzazz to your presentation. The program is so simple that you will be using it expertly within minutes. You can use any PostScript font that is resident in your laser printer or any downloadable PostScript font. Desktop publishing will never be the same.

Happy Publishing!!!!!

This is an example of one of the effects available in Laser FX. We are using High Rise in this example to show how easy it is to use. The actual effect took 20 seconds to create and approximately 35 seconds to print. The screens above are actual reproductions of the options chosen to produce the effect seen on the right. We are using Helvetica®, one of the standard fonts found in the PostScript™ laser printer. As you can see by the various option windows above, there are millions of combinations of this effect (excluding point size, skewing, and rotation options). The examples on the right are a few of the 30 effects available on Laser FX.

See us in Boston at the MacWorld EXPO Booth #558

Circle 724 on reader service card
Tagged-Image File Format—has already emerged as the only current universal standard. Apple’s PICT and PICT II graphic-image file formats allow functions like the Scrapbook to work, but the PICT formats aren’t powerful enough for the current generation of graphic scanners and software that handles complex graphic images. TIFF, promulgated by Aldus, is the de facto standard for graphics storage. But even TIFF has problems: it allows for enough file-format variation from application to application so that data is not completely interchangeable, and it has no ability to store color or gray-scale images. So the need remains for defining and implementing a standard file format for graphics that will allow the transparent use of different programs and scanners.

Part of the Mac II’s promise is that it will open new markets for Apple while providing cheaper workstations for professionals such as engineers, scientists, and programmers. Clearly, its success in these areas will depend on UNIX and graphics cards more powerful than those now available—and Apple is working toward both. Less clear is whether Apple is evangelizing software developers from outside its customary band of supporters and bringing them into the Mac community. Another key to entering those markets: communications.

Two sessions at the conference addressed plans for more powerful communications. While it is important that Apple make clear its intent to work with communications environments such as OSI and SNA, most of us are more concerned with how Apple can improve upon the bandwidth and functionality of AppleTalk. The Ethernet implementation raises the data transfer rate of AppleTalk to several times that of the current rate. Cards from third-party developers, such as Kinetics, allow the SE to take advantage of Ethernet implementation.

One of the most encouraging aspects of the conference was the continued spirit exhibited by a group of technical managers who have been with Apple since the Mac’s announcement. Over the years, most have retained the vision of the original Macintosh. I left the conference thinking that perhaps the Apple community has the right composition to move to the next generation of computers—the ones that will inspire us as much as the original Macintosh did.
Which One(s) Fit(s)?

More Than 600 Titles
We offer all the most popular Mac programs...more than 600 titles, including games, productivity, page processing, spreadsheet, database, accounting, word processing and graphics, along with many specialty applications. And, every piece of software is available for trial, before you make a purchase decision.

Call Right Now for Prices and Catalog
No matter what program you're thinking of buying, it makes sense to try it out first, under your conditions. Not a demo disk, not sitting in a store, but on your machine, in your home or office. If it does what you want, keep it, and pay the balance to purchase. If it doesn't, send it back. Either way, you'll know for sure. And, either way, you'll buy only Software That Fits™.

Software That Fits™
1-800-972-3018
(713) 540-2300

Save on Sony Disks!
SS (2 boxes) $1.05  SS (100 bulk) $.92
DS (2 boxes) $1.50  DS (100 bulk) $1.22
FREE Sony Videotape
minimum 5 boxes, or 100 bulk
Hurry, quantities are limited

Buy the Right Software at the Right Price
Thousands of software buyers have found they can make the right software purchase every time, and save money with our trial use plan.
Here's how it works. Pick the programs you wish to evaluate. Try them out, for a fraction of the purchase price. If they fit, keep them, and pay the balance. If they don't, send them back. You pick the winners, and you buy only the right stuff. (And, when you add up the trial and balance prices, you're still paying far less than retail!!)

Side-by-Side-by-Side Comparisons
Maybe you're looking at the hot new word processors, or perhaps, an advanced database program, the slick new graphics packages, or several accounting programs.
But, in spite of all the reviews you've read, and all the "advice" you've gotten, you're still unsure which one fits your application, and which one will run best on your system.
We'll send you full working originals (manuals included), so you can make comparisons between competing programs. As a result, you'll probably never waste money, buying the "wrong" program again.

MacRENTALS™  P.O. Box 4028 • Humble, TX 77347  Circle 368 on reader service card
Analyze! The Only Thing More Powerful Than The Boss.

Why is Analyze!™ more powerful than the boss? Because like your boss it's fast, efficient and most importantly, Analyze! is never wrong.

Analyze! is an electronic spreadsheet program for the Macintosh™ that turns you and your computer into financial wizards. Analyze! is easy to use, yet sophisticated enough to keep track of anything, from your checkbook to your company's general ledger.

Analyze! commands can be entered from the mouse or keyboard. Dozens of built-in functions make complex calculations effortless.

Your data can be presented using one of Analyze!™'s 8 breathtaking graph models. As many as 4 graphs in 2, 4 or 16 colors can be displayed to create professional looking sales reports.

Additional features like a macro language to automate your spreadsheets, powerful print, sort functions and compatibility with other popular spreadsheets will make you wonder how you ever lived without Analyze!.

Analyze! is easy to learn, supported by an informative reference manual and our expertly trained Technical Support Division.

Ask for a dealer demonstration of this fine product, or call our Technical Support Line at (305) 790-0772

For a dealer near you call:
Brown-Wagh Publishing:
(800) 451-0900
In Ca: (408) 395-3838
16795 Lark Ave., Suite 210
Los Gatos, CA 95030

MICRO-SYSTEMS SOFTWARE, INC. ...8 years of quality software and still growing strong!

Circle 796 on reader service card
Williams & Macias

myDiskLabeler™

Be as organized outside your Macintosh™ as you are inside

- Create quality disk labels
- Mix graphics with text
- Grab application icons
- Read disk directories
- Serialize your labels
- Easy alignment and printing using graphics interface
- Use LaserFonts on LaserWriter™
- Includes 54 labels

Version 2 -- Only $44.95*
Add $10.00 for version with color printing. Add $20.00 for version with both LaserWriter™ and color printing. Refills: 216 Smart Labels™—$18.00, 216 Laser Labels™—$22.00.

*Shipping to USA/Canada is $3.00 ($1.00 for each additional item). Washington State residents add 7.8% sales tax.

Ask your Apple® dealer, or call today for immediate delivery
1-800-752-4400
M-F 8:00 to 5:00 PST • Wash. & Alaska, call (509) 458-6312
VISA & Mastercard
Re-ink ANY FABRIC RIBBON automatically for LESS THAN 5 CENTS with MAC INKER™

Over 11,000 cartridges and spools supported!

MAC INKER

IMAGEWRITER I AND II

UNIVERSAL (cartridge or spool)

MULTICOLOR IMAGEWRITER

MULTICOLOR ADAPTER ONLY

Shipping (first unit) $3.00

$42.00

$68.50

$80.00

$40.00

- 24 month warranty.
- Status lights. ■ Speaker.
- 300/1200 baud. ■ Call progress detection.
- DEDICATED MAC INKERS AVAILABLE FOR EXTRA LARGE OR SPECIAL CARTRIDGES.

Lubricated DM INK EXTENDS PRINT-HEAD LIFE! Black, blue, brown, red, green, yellow, purple, orange - 2 oz. bottle $3.00; pint $19.50.

Gold, silver, indelible and OCR inks available. Heat transfer Macinkers and ink available plus a complete range of accessories for special applications.

MERCU RY MODEM

100% Hayes™ compatible!

$149.00

Shipping $4.00

Quick Link communications software:
MS DOS and Macintosh $29.95 - with modem $15.00 - Cable $15.00.

*Hayes is a trademark of Hayes Microproducts.

Connect up to 4 peripherals! with DATA SWITCHES

2 Port $46.00

4 Port $59.00

Shipping $4.00

Parallel, serial, 2 or 4 way, crossed, etc.

CABLES

We carry cables for all common computers and peripherals. Rapid turn-around on custom Competitively priced.

SPECIAL OFFER:
For orders of $100.00 or more. Say you saw it in MACWORLD and get a free keychain, beep and flashlight combined! A $15.00 value!

ORDER TOLL-FREE

1-800-547-3303

In Oregon (503) 626-2291 -(24 hour line)

We are and always will be your Computer Friends®

14250 N.W. Science Park Drive
Portland, OR 97229, Telex 4949559

Dealer Inquiries Welcome.

Contributors

Notes

Dale Coleman ("Mac Communications Tools") is coauthor of The Macintosh Bible, published this year by Goldstein & Blair. For years he has explored the byways of user bulletin boards, including several stints as a sysop for private BBSs.

Jim Heid ("The Desktop Publishing Shopper") is a contributing editor of Macworld. He has been writing about the Macintosh since its introduction and has recently completed his second Macintosh book, dBASE Mac in Business (Ashton-Tate Publishing, 1987).

Prasad Kaipa ("Beefing Up the SE") teaches at the University of Utah and offers his advice through MacWiz Consulting in Salt Lake City.

Erfert Nielson ("Desktop Design") was a founding member of the Macworld staff. She put her art-school training to work and quickly became a Mac graphics specialist.

Lon Poole ("The QuickDraw Solution") has been educating Macintosh users since the machine was introduced. Every month he answers readers' questions in his Quick Tips column; a book of his tips, Mac Insights, was published this year by Microsoft Press.

Charles Seiter ("Mastering Mail Merge") is a chemistry professor turned computer writer whose books on computer topics include two works on Pascal published by Addison-Wesley. He is the only author who has ever submitted a manuscript to Macworld written in a programming language.

Bruce Webster ("Beefing up the SE") is a widely published writer who specializes in personal computer topics. His first Mac was a 128K, single-drive (400K) system; his latest Mac was still under construction at press time.
MegaScreen's 19.5" monitor gives you 526% more design space than your Macintosh™ Computer. Compatible with all standard Macintosh software, MegaScreen lets you see drawings, designs, page spreads, spreadsheets, and just about everything you ever wanted to see larger, 526% larger.

MegaScreen's dual-screen features allow you to run MegaTalk Electronic Mail on your Macintosh screen — at the same time. MegaScreen concentrates on your primary application while letting those important messages flow through to you.

MegaScreen is the most flexible, user-definable video device available. Your local Apple® dealer can install MegaScreen for your Macintosh SE, Macintosh Plus or Macintosh 512kE — usually in less than 15 minutes. You might even add enhancement options, such as co-processors, speed cards and other video outputs.

Ask your dealer for a demonstration, or give us a call. You'll see why MegaScreen is still the best-selling Macintosh large screen system.

©1987 Micrographic Images, Inc. All rights reserved. MegaScreen is a trademark of Micrographic Images, Inc. Apple is a registered trademark, and Macintosh is a trademark of Apple Computer, Inc. Macintosh is not a product of Micrographic Images, Inc. and is used under license by the manufacturer.
Your entire accounting staff can order from this menu.

Feast your eyes on the one menu that lets your entire accounting department share access to the most powerful, most complete multiuser accounting system ever developed for Macintosh." This is Multiuser Desktop Accounting" (MDA).

Using MDA, your staff can keep your company in order. Tracking projects and controlling every aspect of your company's financial operation. And they can do so for multiple companies.

Service for one or a party of 32.

Whether your accounting department is a single desk, or several offices, MDA will fit your needs. With plenty of room for growth.

The single-user version is upgradeable to multiuser. And with the multiuser version, you can expand up to 32 workstations.

What's more, your entire staff can work at the same time. Even on the same datafile. While one person is recording accounts payable, another can update inventory, and someone else can process sales orders.

The system uses record locking to safeguard against two people editing the same record. And to limit user access where necessary, MDA gives you eight user security password levels plus a master user level.

An expandable selection of capabilities, courtesy of OMNIS 3 Plus™

MDA is a highly sophisticated accounting system. Written by accountants. For accountants. And best of all, it's written on the OMNIS 3 Plus database.

In MACWORLD, OMNIS 3 Plus has been described as "...Powerful, Ultra Fast, Dependable, Flexible, and probably the most supported relational database management program there is for the Apple Macintosh computer."

That means an accounting system with plenty of power and very few limitations. For example, MDA handles numbers up to $9,999,999,999.99—per account. And the number of accounts is limited only by disk capacity.

All of MDA's accounting functions are fully integrated, so it's truly a single-entry system. And those functions include virtually every accounting procedure you could ask for. (Just look at the menu.)

If you don't see something you need, don't worry. With the purchase of our Coding Option—and the help of an OMNIS 3 developer—you can create your own formats and reports, then integrate them into the system.

In addition, a growing number of optional modules—including a complete payroll system—are available to meet specialized accounting requirements.

A single menu means singular ease of use.

With MDA, accountants can put the full power of computers to work, without having to learn complex commands and operating procedures.

You initiate every accounting and reporting operation from the MDA menu. There are no separate modules to load.

The entire system is menu-driven. So you can proceed from one operation to another with speed and confidence. Even switch from one company to another simply by selecting a command.

Full service, and expert technical support.

Should you have a question or a new requirement, you can rest assured you'll get the support you need. MDA is supported by the nationwide network of OMNIS Support and Development Centers. In addition, training is available for you and your staff at any MDA Certified Training Center.

Now that we've whet your appetite with the multiuser capabilities of MDA, call 1-800-458-7466. And put the power of Multiuser Desktop Accounting to work in your office.

MDA Multiuser Desktop Accounting from CIRCO BUSINESS SOLUTIONS

1729-A Little Orchard Street, San Jose, CA 95125 (800) 458-7466 (408) 998-1132
Look for us at Mac Expo Boston Booth 726

Macintosh is a trademark licensed to Apple Computer, Inc. OMNIS 3 Plus is a trademark of Bloch Software, Ltd.

© 1987 Circo Business Solutions.

Circle 697 on reader service card
Use QuickDEX within your Macintosh™ word processor to quickly find a name and address. QuickDEX includes over 1000 area codes and zip codes for the major cities of the United States. No more thumbing through the phone book! It's fast, efficient and easy.

PrintDEX, a companion program that comes with QuickDEX, is capable of printing your name and addresses on Rolodex® or Rediform™ cards. That's useful for easy reference when your Mac isn't available. You can print your data sorted by name and by company. You can also just print cards that have changed since the last printing. If your address book looks like it's been rewritten 10 times over, you'll appreciate the organization PrintDEX can provide.

List price is $35 plus $2.50 shipping. If QuickDEX doesn't suit your needs, return it within 60 days and we'll refund the purchase price.

What are we to think of the Macintosh SE? We learned about it as a sidebar to the much sexier story of the Macintosh II, yet Apple described it as the computer destined to be the mainstay of the entire line. Apple boasted that it has only one part in common with the Macintosh Plus (the monitor), yet it was designed to behave like a Plus. Clearly the SE is more than just a Mac with a slot. But what? We are told we cannot upgrade our present Macs to an SE: should we be indignant at this? What are we missing? What was the need for an intermediate computer between the Plus and the II?

Is it a must? Or is it a botch?

Many will sound the soul of the Macintosh II, but the SE, I suspect, will prove a more elusive creature. The only way to get under its skin—without violating the warranty—is to get hold of one and take it through its paces: drum its keyboard, shove data into its drives, stare balefully into its screen, and maybe, mesmerized by the relentless hum of its fan, you will dislodge its secrets, if indeed any exist. At least that was my purpose in procuring one of these beasts. And after several weeks submerged in the caverns of SE computing, I have returned. Not only alive, but impressed. Though only mildly.

And although I attempted to conjure up answers, I discovered that some of the questions posed in the first paragraph of this column were as hardy as New York cockroaches.

SE? It works.

By Apple’s standards, the SE is a job well done. Charles Oppenheimer, Apple’s SE spokesperson, recently explained to me that in early 1986, after Apple successfully introduced the Macintosh Plus, Mac users were finally given the power and performance they required. Those with huge needs would be satisfied with the Open Mac, well under way at that time. So what was the future for the standard-sized Mac?

Apple perceived that users still wanted two things from the Mac. An internal hard disk drive. And a slot—a direct hardware access that would enable users to connect all sorts of goodies, from accelerator cards to MS-DOS coprocessors. So the next iteration of Macintosh would fill that short wish list. In addition, Apple would try to improve on the Plus in other ways, ranging from tiny details like a larger on/off switch to some significant changes like a new keyboard, as well as yet another increase in speed.

This was all to be accomplished while maintaining maximum compatibility with previous Macintoshes. This was not, like the Macintosh II, something that would render useless much of the software on the user’s shelf. So while everything about the SE—except the monitor—is different, what (continues)
Absolutely.
With TOPS, a PC and a Macintosh can really talk together. Simply, transparently, reliably. In real time.
And now UNIX-based computers can join the conversation.
TOPS has been extended to support computers from Sun Microsystems and Pyramid Technology.*
And now TOPS for the Mac includes **print spooling** and **file translators**.

---

You can now access Microsoft Excel files from a Mac SE, for example, modify them on your PC AT under Lotus 1-2-3, and save them on your Sun Workstation.
TOPS uses no central file server—every machine on the LAN can serve every other. Yet TOPS is so affable that file servers from 3Com, Novell, Banyan, and AppleShare can join right in.

---

According to *InfoWorld* and *PC Week*, TOPS is the easiest to learn and operate Local Area Network yet designed.
With TOPS you have your choice of LANs. Macs can talk solely to Macs, or PCs to PCs, or both can talk to each other or to UNIX-based computers. TOPS brings together parts of your office that until now were barely on speaking terms.

---

*Call for information on how to buy UNIX versions, available Third Quarter.
TOPS has over half the Fortune 500 companies talking. With good reason. Installation is quick and straight-forward—roughly four minutes for a Macintosh and fifteen minutes for a PC. And this talk is remarkably cheap. TOPS is $189 per Macintosh and $389 per PC.

Our TOPS family is growing. With TOPS PRINT™ (at $189) all your PCs can share Apple's LaserWriter™. And TOPS REPEATER™ (also at $189) allows you to expand AppleTalk™ and TOPS networks.

TOPS for Macs and PCs, TOPS PRINT and TOPS REPEATER are available at Businessland and other fine computer dealers.

Call us at 800-222-TOPS (in California, 800-445-TOPS). And we'll do just what a Sun workstation, a PC and a Macintosh can now do. Talk.

TOPS Network
an independent unit of sun microsystems

TOPS is a registered trademark and TOPS PRINT and TOPS REPEATER are trademarks of Centram Systems West, Inc., an independent unit of Sun Microsystems. UNIX is a registered trademark of AT&T. All other product names are trademarks or registered trademarks of their manufacturers.

Circle 524 on reader service card
MacSnap Internal Memory Expansions by Dove Computer Corporation

It's a safe bet that no matter what Macintosh model you have, Dove Computer has a MacSnap memory expansion product that matches your needs. That's because Dove has the most extensive line of high quality memory and productivity enhancement products available which are easy to install and represent a superior value! We've selected some of the most popular models at special prices and we'll include the MacSnap Toolkit (Wrench, Case Cracker & Grounding Set) at no extra charge to make installation a SNAP!

MacSnap Model 524 (Designed for the 512K Mac with 64K ROM. Expands memory from 512K to 2048K) ..................... 139.
MacSnap Model 524E (Designed for the 512K Enhanced Mac with 128K ROM. Expands memory from 512K to 2048K) ........ 139.
MacSnap Model 548 (Designed for the 512K Mac with 64K ROM. Expands memory from 512K to 2048K) ..................... 359.
MacSnap Model 548E (Designed for the 512K Enhanced Mac with 128K ROM. Expands memory from 512K to 2048K) ........ 359.
MacSnap Plus 2 (Designed to expand the MacPlus from 640K to 1600K, not expandable) .......................... 249.
MacSnap Plus 2H (Designed to expand the MacPlus or Mac SE from 640K to 2048K using 1 Meg CMOS SIMMs. The 2H is expandable to 4 Megs) ...... 569.

WorksPlus Spell by Lundeen & Associates

WorksPlus Spell is the only spelling checker fully integrated with Microsoft Works. Once installed, it becomes part of Works, increasing its power and flexibility. It's so easy to use, just click "check spelling" and Spell is off and running through the document. At 24,000 words per minute, faster than any other spelling checker available. There's a super glossary feature which inserts often used words or phrases (i.e. your name and address) with just a key stroke. Spell can also hyphenate automatically for you. WorksPlus Spell checks and hyphenates in both interactive or batch modes. If you use Works, you must have WorksPlus Spell!

WorksPlus Spell .................................. 35.

Utility Software

Apple Computer Switcher Construction Set 14.
Berkeley System Design Stepping Out (Macintosh Screen Extender) 58.
Central Point Software Copy II Mac (Includes MacTools) 20.
F&V Software Hard Disk Utility 56.
Softbyte Softbyte Printer 29.
3D Quick (Disk Librarian) 29.
InfoSphere MacServe (Network Software) 65.
MacServe (LaserWriter Print Spooler) 65.
ConServe (Modem Sharing Software) 195.
MaxMemory, Inc. MaxRam & MaxPrint 33.
Oldsoft Software DMA-Switcher 36.
Icon-It 39.
Personal Computer Peripherals Corp. IF'S Backup V2.0 34.
Excellat (File Finding Accessory) 18.
Softbyte Printworks 42.
Laserprint 58.
DiskIt (Backup & Restore Utility) 49.
Multi-User SuperLaser 259.
Think Technologies LaserSpeed (Single User) 65.
myDiskLabeler w/Color 33.
myDiskLabeler w/LaserWriter Option 35.

Central Point 800K Drive & Copy II Mac Bundle by Central Point Software, Inc.

Now you can add 800K of Apple compatible storage to your Mac at an affordable price. These 3.5 inch drives are functionally identical to Apple's Macintosh drives but cost half as much! The Central Point Drive connects to a Mac SE, MacPlus, or Mac II Expanded computer and it is SUPER quiet and includes an LED "IN-USE LIGHT!" To complement this high quality drive we are including at no extra charge, the most powerful disk backup and utility package on the market, the award winning, Copy II Mac!

Central Point 800K Drive & Copy II Mac Bundle ........... 199.00

Desk Accessory Programs

Affinity Micsystems Tempo 55.
Batteries Included Battery Pak (9 Desk Accessories) 32.
Rotland SideKick V3.0 59.
Cordland Top Desk (7 New Desk Accessories) 34.

Languages

Apple Computer MacPascal 99.
Roland Turbo Pascal 59.
Consularr Macintosh 68000 Development System 59.
Mainstay V.I.P. (Visual Interactive Programming) 85.
Microsoft Microsoft Basic Interpreter 3.0 64.

Communications Software

Apple Computer MacTerminal 99.
CompuServe Community Starter Kit 24.
DataVault MacLink Plus with Cable 149.
Hayes Microcomputer Smartcom II 88.

Utility Software

Apple Computer Switcher Construction Set 14.
Berkeley System Design Stepping Out (Macintosh Screen Extender) 58.
Central Point Software Copy II Mac (Includes MacTools) 20.
F&V Software Hard Disk Utility 56.
Softbyte Softbyte Printer 29.
3D Quick (Disk Librarian) 29.
InfoSphere MacServe (Network Software) 65.
MacServe (LaserWriter Print Spooler) 65.
ConServe (Modem Sharing Software) 195.
MaxMemory, Inc. MaxRam & MaxPrint 33.
Oldsoft Software DMA-Switcher 36.
Icon-It 39.
Personal Computer Peripherals Corp. IF'S Backup V2.0 34.
Excellat (File Finding Accessory) 18.
Softbyte Printworks 42.
Laserprint 58.
DiskIt (Backup & Restore Utility) 49.
Multi-User SuperLaser 259.
Think Technologies LaserSpeed (Single User) 65.
myDiskLabeler w/Color 33.
myDiskLabeler w/LaserWriter Option 35.

Central Point 800K Drive & Copy II Mac Bundle by Central Point Software, Inc.

Now you can add 800K of Apple compatible storage to your Mac at an affordable price. These 3.5 inch drives are functionally identical to Apple's Macintosh drives but cost half as much! The Central Point Drive connects to a Mac SE, MacPlus, or Mac II Expanded computer and it is SUPER quiet and includes an LED "IN-USE LIGHT!" To complement this high quality drive we are including at no extra charge, the most powerful disk backup and utility package on the market, the award winning, Copy II Mac!

Central Point 800K Drive & Copy II Mac Bundle ........... 199.00

Desk Accessory Programs

Affinity Micsystems Tempo 55.
Batteries Included Battery Pak (9 Desk Accessories) 32.
Rotland SideKick V3.0 59.
Cordland Top Desk (7 New Desk Accessories) 34.

Languages

Apple Computer MacPascal 99.
Roland Turbo Pascal 59.
Consularr Macintosh 68000 Development System 59.
Mainstay V.I.P. (Visual Interactive Programming) 85.
Microsoft Microsoft Basic Interpreter 3.0 64.

Communications Software

Apple Computer MacTerminal 99.
to Polish Up Your Mac

Bulk Mailer Plus 3.0 by Satori Software

Bulk Mailer Plus is a powerful program specifically designed for managing lists. Bulk Mailer Plus does everything you want in a mail list program, including duplication elimination. Zip and alpha sorts, 1 to 4 up labels printed, easy entry defaults, multiple label format, plus much, much, more. This is the only program to offer all of the following features: Duplication elimination, Zip or alpha sort, Car-rt sort or zip +4, International address capability, 1 to 4 up labels or roster format, powerful coding capabilities, sophisticated global editing and deleting, mail merge with Microsoft Word, easy to use entry defaults, coding and date expiration fields, hard disk compatibility, and an incredibly large record capacity of up to 90,000 names! Put Bulk Mailer Plus on your software list and order today!

Bulk Mailer Plus 3.0 (up to 90,000 names) ............... 199.00
Bulk Mailer 3.0 (up to 8,600 names) ............... 89.00

TurboMaccountant 2.0 by Digital, Etc.

Your books are always up to date with this do it all business accounting system. All journals, G/L, A/R, A/P, Payroll and Budgeting are integrated into one program so posting is just a click away..."module hopping" is unnecessary! TurboMaccountant features convenient data entry short cuts like recurring entries and supports salesman commissions, has user definable tax-tables, and powerful reports including financial ratios that will aid in business analysis. Automatic posting means you never have to "close out your books at month end" so your period to date reports are always current. TurboMaccountant supports 500 departments and 8,000 each customers, vendors, and employees. Print checks, invoices, statements, mailing labels, W-2 and 1099 forms.

It's easy to learn, easy to set up, and easier to use. TurboMaccountant is our choice for the "best buy" in accounting packages!

TurboMaccountant 2.0 ....... 259.00

MacRacquetball by Practical Computer Applications

MacRacquetball is the hottest game the Mac can handle. CONTROL EVERYTHING — speed, agility, stamina and accuracy, even the strategies and the types of serves and rallies. How real is it? Even the shoes squeak! Even if you've never been on a court, you'll work up a sweat with this simulation without putting on your Reeboks. MacRacquetball is so authentic, it can actually teach proper form and techniques. AND, there are multi-player capabilities. Play with two Macs back-to-back using the ImageWriter II printer cable or over the modem. The quality and play-variety is unmatched. Designed to be the "Best Sports Game of 1987" it's one racquetball court that's always open!

MacRacquetball ......... 35.00

Circle 194 on reader service card
**Disk Drives/Hard Disks/Upgrades**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST-1000</td>
<td>20 MB External Hard Disk with 20 MB Cartridge-Tape Backup for the Macintosh Plus</td>
</tr>
<tr>
<td>AST-2000</td>
<td>20 MB External Hard Disk with 20 MB Cartridge-Tape Backup for the Macintosh Plus</td>
</tr>
<tr>
<td>MacSnap Model 548</td>
<td>4 MB Microdrive (MaxMac)</td>
</tr>
<tr>
<td>MacSnap Model 548</td>
<td>4 MB Microdrive (MaxMac)</td>
</tr>
</tbody>
</table>

**Blank Media**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Sony 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Centex 3.5&quot; SS/DD Color Disk Colors</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Fuji 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Maxell 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Verbatim 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>3.5&quot; SS/DD/SS HDD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>C.itech Color Disks SS/DS/DD (box of 5)</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
</tbody>
</table>

**Modems**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transcend 1000-128K</td>
<td>499.00</td>
</tr>
<tr>
<td>Transcend 1000-128K</td>
<td>499.00</td>
</tr>
<tr>
<td>Promodcm 2400</td>
<td>469.00</td>
</tr>
<tr>
<td>Promodcm 2400</td>
<td>469.00</td>
</tr>
<tr>
<td>Peripherals (Mac Plus, SE)</td>
<td>20 MB External RAM Disk Drive</td>
</tr>
<tr>
<td>Peripherals (Mac Plus, SE)</td>
<td>20 MB External RAM Disk Drive</td>
</tr>
</tbody>
</table>

**Digitizers**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
</tbody>
</table>

**Ordering Information**

Orders Only 1-800-832-3201

In Connecticut call 378-3662 or 378-8293  
Customer Service (203) 378-3662  
Monday thru Friday 9 A.M. to 9 P.M.  
Saturdays 10 A.M. to 6 P.M. (Eastern Time)

Our Policies
- We accept MASTERCARD and VISA with no added surcharge.
- Your credit card is not charged until shipment.
- If we must ship a partial order the shipment completes the order is not freight free.
- If you are not satisfied with the equipment, we accept returns at our discretion for full credit, send packing list, complete with return address and the reason for the return.  
- Orders must be prepaid in full and returns must be prepaid.
- We do not accept COD orders.

**Shipping**

- Domestic orders: Continental US $10.00 at time of shipment; Alaska and Hawaii $15.00 at time of shipment.
- International orders: All international orders are subject to additional shipping costs.
- All products are sold and shipped by the manufacturer, and we cannot guarantee identical compatibility. Due to software copyright laws, all sales are final. Defective software will be replaced immediately upon return of the defective software. 
- New and used products are printed with Coyo quality data. 
- Prices and listings are subject to change. 
- All prices subject to change. 
- Products purchased in error subject to a 20% restocking fee. All items subject to availability. 

**Blank Media**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Sony 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Centex 3.5&quot; SS/DD Color Disk Colors</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Fuji 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Maxell 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Verbatim 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>3.5&quot; SS/DD/SS HDD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>C.itech Color Disks SS/DS/DD (box of 5)</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
</tbody>
</table>

**Digitizers**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
</tbody>
</table>

**Ordering Information**

Orders Only 1-800-832-3201

In Connecticut call 378-3662 or 378-8293  
Customer Service (203) 378-3662  
Monday thru Friday 9 A.M. to 9 P.M.  
Saturdays 10 A.M. to 6 P.M. (Eastern Time)

Our Policies
- We accept MASTERCARD and VISA with no added surcharge.
- Your credit card is not charged until shipment.
- If we must ship a partial order the shipment completes the order is not freight free.
- If you are not satisfied with the equipment, we accept returns at our discretion for full credit, send packing list, complete with return address and the reason for the return.  
- Orders must be prepaid in full and returns must be prepaid.
- We do not accept COD orders.

**Shipping**

- Domestic orders: Continental US $10.00 at time of shipment; Alaska and Hawaii $15.00 at time of shipment.
- International orders: All international orders are subject to additional shipping costs.
- All products are sold and shipped by the manufacturer, and we cannot guarantee identical compatibility. Due to software copyright laws, all sales are final. Defective software will be replaced immediately upon return of the defective software. 
- New and used products are printed with Coyo quality data. 
- Prices and listings are subject to change. 
- All prices subject to change. 
- Products purchased in error subject to a 20% restocking fee. All items subject to availability. 

**Blank Media**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Sony 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Centex 3.5&quot; SS/DD Color Disk Colors</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Fuji 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Maxell 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>Verbatim 3.5&quot; SS/DD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>3.5&quot; SS/DD/SS HDD Diskettes</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
<tr>
<td>C.itech Color Disks SS/DS/DD (box of 5)</td>
<td>8.92/0.92/2.92/18.92</td>
</tr>
</tbody>
</table>

**Digitizers**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
<tr>
<td>AST TurboScan (Optically Senses)</td>
<td>249.00</td>
</tr>
</tbody>
</table>
### Database Management

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashton-Tate dBase Mac</td>
<td></td>
</tr>
<tr>
<td>Bytefile Software Omni 3 Plus</td>
<td></td>
</tr>
<tr>
<td>Omni 3 Plus Multi-User</td>
<td></td>
</tr>
<tr>
<td>(MacServer, Tux Network, Cursor, or Application Network)</td>
<td></td>
</tr>
<tr>
<td>Borland Reflex</td>
<td>99.64</td>
</tr>
<tr>
<td>Forethought FileMaker Plus</td>
<td>159.19</td>
</tr>
<tr>
<td>Microsoft &amp; Oracle Microsoft File 1.05</td>
<td>110.32</td>
</tr>
</tbody>
</table>

### Business Software

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Computer MacProject</td>
<td>159.03</td>
</tr>
<tr>
<td>Batteries Included</td>
<td>169.01</td>
</tr>
<tr>
<td>Egger Portfolio System</td>
<td>12.12</td>
</tr>
<tr>
<td>Time Link</td>
<td>13.23</td>
</tr>
<tr>
<td>Bravo Technologies MacCalc</td>
<td>85.12</td>
</tr>
<tr>
<td>Cricket Software</td>
<td></td>
</tr>
<tr>
<td>Cricket Graph</td>
<td>125.98</td>
</tr>
<tr>
<td>Data Tailor</td>
<td></td>
</tr>
<tr>
<td>Tracpro (Spreadsheet/Color) Report Generator</td>
<td>169.05</td>
</tr>
<tr>
<td>Forethought PowerPoint</td>
<td>209.07</td>
</tr>
<tr>
<td>Layered</td>
<td></td>
</tr>
<tr>
<td>Notes For Excel, PageMaker, or</td>
<td></td>
</tr>
<tr>
<td>Microsoft Works (each)</td>
<td>42.53</td>
</tr>
<tr>
<td>Logo/Label/Print/WillWriter V2.0</td>
<td>31.00</td>
</tr>
</tbody>
</table>

### Word & Outline Processors

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann Arbor Softworks FullWrite Professional</td>
<td>169.75</td>
</tr>
<tr>
<td>Apple Computer MacWrite</td>
<td>99.01</td>
</tr>
<tr>
<td>Fired License Author</td>
<td>100.01</td>
</tr>
<tr>
<td>Living Videoz Music</td>
<td>149.01</td>
</tr>
<tr>
<td>Microsoft Word 3.0i</td>
<td>239.01</td>
</tr>
<tr>
<td>T/Maker Company WriteNow</td>
<td></td>
</tr>
</tbody>
</table>

### Spelling & Grammar Checkers

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argeis Development</td>
<td></td>
</tr>
<tr>
<td>DragChaps Word Tools</td>
<td>45.01</td>
</tr>
<tr>
<td>Argeis Speed Speller</td>
<td>20.01</td>
</tr>
<tr>
<td>Word Tools Combo Pack</td>
<td>63.02</td>
</tr>
<tr>
<td>A.P.L. Systems MacProof V2.0</td>
<td>(Requires MacPlus)</td>
</tr>
<tr>
<td>Batteries Included</td>
<td></td>
</tr>
<tr>
<td>Thunder! (Interactive Spelling Checker)</td>
<td>32.01</td>
</tr>
</tbody>
</table>

### Desktop Publishing

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldus Corporation</td>
<td></td>
</tr>
<tr>
<td>PageMaker</td>
<td>419.01</td>
</tr>
<tr>
<td>Boston Publishing Systems</td>
<td></td>
</tr>
<tr>
<td>The MacPublisher III</td>
<td>199.01</td>
</tr>
<tr>
<td>Letraset Letra Hyphen</td>
<td>79.01</td>
</tr>
<tr>
<td>Lettra Xtra</td>
<td>79.01</td>
</tr>
</tbody>
</table>

### Accounting Packages

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPI</td>
<td>155.01</td>
</tr>
<tr>
<td>BPI Entry Series-General Accounting</td>
<td></td>
</tr>
<tr>
<td>Chang Labs</td>
<td></td>
</tr>
<tr>
<td>Rags to Riches GL, AR, or AP</td>
<td>125.01</td>
</tr>
<tr>
<td>Rags to Riches Three Pack-GL(A/R/AP)</td>
<td>299.01</td>
</tr>
<tr>
<td>Inventory Control</td>
<td>243.01</td>
</tr>
<tr>
<td>Professional Billing</td>
<td>243.01</td>
</tr>
<tr>
<td>Professional Three Pack-GL(A/R/AP)</td>
<td>349.01</td>
</tr>
<tr>
<td>Digial, Etc.</td>
<td></td>
</tr>
<tr>
<td>Turbo Acrobat V2.0</td>
<td>Special 299.01</td>
</tr>
</tbody>
</table>

### Statistics Packages

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BrainPower</td>
<td></td>
</tr>
<tr>
<td>StatView S2 Plus</td>
<td></td>
</tr>
<tr>
<td>Cricket Software Statworks</td>
<td></td>
</tr>
</tbody>
</table>

### Graphics Software

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfresco Corp. FONTastic</td>
<td></td>
</tr>
<tr>
<td>FONTastic Plus</td>
<td></td>
</tr>
<tr>
<td>Arthur Ann Softworks Full Paint</td>
<td></td>
</tr>
<tr>
<td>Appie Computer MacPaint</td>
<td></td>
</tr>
<tr>
<td>Broderbund Print Shop</td>
<td></td>
</tr>
<tr>
<td>Casadeware</td>
<td></td>
</tr>
<tr>
<td>Fluent Fonts (Two-Disk Set)</td>
<td></td>
</tr>
<tr>
<td>Fluent Fonts Vol. 1-1.5 ea</td>
<td></td>
</tr>
<tr>
<td>Denzel Software Canvas</td>
<td></td>
</tr>
<tr>
<td>Campus DA</td>
<td></td>
</tr>
<tr>
<td>MacObject Library</td>
<td></td>
</tr>
<tr>
<td>MacDraft</td>
<td></td>
</tr>
<tr>
<td>World Class Fortnite Vol. 1 or Vol. 2</td>
<td></td>
</tr>
<tr>
<td>World Class Fortnite/(Both Volumes)</td>
<td></td>
</tr>
<tr>
<td>Wet Paint Vol. 1 or Vol. 2</td>
<td></td>
</tr>
<tr>
<td>WetPaint (Both Volumes)</td>
<td></td>
</tr>
<tr>
<td>Zuran-Hosokawa (USA)</td>
<td></td>
</tr>
<tr>
<td>MacPaint II</td>
<td></td>
</tr>
<tr>
<td>Japanese Chip Art Vol. 1 (Heaven)</td>
<td></td>
</tr>
<tr>
<td>or Vol. 2 (Earth)</td>
<td></td>
</tr>
</tbody>
</table>

### CAD Products

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Computer MacDraw</td>
<td>159.01</td>
</tr>
<tr>
<td>Challenger Software</td>
<td></td>
</tr>
<tr>
<td>Mac 3D (Enhanced Version 2.0)</td>
<td></td>
</tr>
<tr>
<td>Cricket Software</td>
<td></td>
</tr>
<tr>
<td>Cricket Draw</td>
<td>Special 169.01</td>
</tr>
<tr>
<td>MacDraft (Updated Version 1.2)</td>
<td>159.01</td>
</tr>
</tbody>
</table>

### Educational/Creative Software

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addison Wesley Puppy Love</td>
<td></td>
</tr>
<tr>
<td>Baceville</td>
<td></td>
</tr>
<tr>
<td>Ted Bear Discovers...Rainy Day Games</td>
<td></td>
</tr>
<tr>
<td>Guitar Wizard</td>
<td></td>
</tr>
<tr>
<td>Bogue Production Studio Session</td>
<td></td>
</tr>
<tr>
<td>Broderbund Scone Geometry</td>
<td></td>
</tr>
<tr>
<td>Davidson &amp; Associates</td>
<td></td>
</tr>
<tr>
<td>Speed Reader II</td>
<td></td>
</tr>
<tr>
<td>Math Blaster or Word Attack</td>
<td></td>
</tr>
<tr>
<td>Electronic Arts</td>
<td></td>
</tr>
<tr>
<td>Deluxe Music Construction Set V2.0</td>
<td></td>
</tr>
<tr>
<td>First Byte/Design Time</td>
<td></td>
</tr>
<tr>
<td>Kid Talk, Speller Bee</td>
<td></td>
</tr>
<tr>
<td>First Shapes, Math Talk</td>
<td></td>
</tr>
<tr>
<td>MathTalk Fractions, First Letters &amp;</td>
<td></td>
</tr>
<tr>
<td>Words, &amp; Spellcheck</td>
<td></td>
</tr>
<tr>
<td>Great Wave Software</td>
<td></td>
</tr>
<tr>
<td>KidTime or TimeMasters</td>
<td></td>
</tr>
<tr>
<td>Easy as ABC</td>
<td></td>
</tr>
</tbody>
</table>

### Game Software

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aecid Off Hard Ball</td>
<td></td>
</tr>
<tr>
<td>Action Shanghi or Hacker II</td>
<td></td>
</tr>
<tr>
<td>Hacker Portal</td>
<td></td>
</tr>
<tr>
<td>Times Times In Towntown</td>
<td></td>
</tr>
<tr>
<td>Artix Bridge 5.0</td>
<td></td>
</tr>
<tr>
<td>Avalon Hill Mac Pro Football</td>
<td></td>
</tr>
<tr>
<td>Beautiful Ancient Art of War</td>
<td></td>
</tr>
<tr>
<td>Bigtime Software</td>
<td></td>
</tr>
<tr>
<td>Fecker Tweek Flight Simulator</td>
<td></td>
</tr>
<tr>
<td>Ferrari Grand Prix</td>
<td></td>
</tr>
<tr>
<td>Electronic Arts</td>
<td></td>
</tr>
<tr>
<td>Electronic Arts Star1</td>
<td></td>
</tr>
<tr>
<td>ChessMaster 2000</td>
<td></td>
</tr>
<tr>
<td>PitchCar Construction Set</td>
<td></td>
</tr>
<tr>
<td>Patron vs Rommel or One-On-One</td>
<td></td>
</tr>
<tr>
<td>Seven Cities of Gold</td>
<td></td>
</tr>
<tr>
<td>SkyFox, Ashen, or Scramble</td>
<td></td>
</tr>
<tr>
<td>EPYX Winter Games</td>
<td></td>
</tr>
<tr>
<td>Stash Battle Simulator</td>
<td></td>
</tr>
<tr>
<td>Firebird Pawn</td>
<td></td>
</tr>
<tr>
<td>Hayden Software Surname III</td>
<td></td>
</tr>
<tr>
<td>Infinity Software, LTD</td>
<td></td>
</tr>
<tr>
<td>Grand Slam Tennis II</td>
<td></td>
</tr>
<tr>
<td>World Cup Soccer</td>
<td></td>
</tr>
<tr>
<td>G3D</td>
<td></td>
</tr>
<tr>
<td>Infocom</td>
<td></td>
</tr>
<tr>
<td>Ballyhoo, Bureaucraty, Hinchiker's</td>
<td></td>
</tr>
<tr>
<td>Goddesses of Phobos, Moon Mist,</td>
<td></td>
</tr>
<tr>
<td>Stationfall, The Raving Horror,</td>
<td></td>
</tr>
<tr>
<td>Trinity, or Zork 1 (each)</td>
<td></td>
</tr>
<tr>
<td>Zork Trilogy</td>
<td></td>
</tr>
</tbody>
</table>

### & Phenomenal Prices!

<table>
<thead>
<tr>
<th>Pricing Options</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft</td>
<td>99.01</td>
</tr>
<tr>
<td>Flight Simulator</td>
<td>32.01</td>
</tr>
<tr>
<td>Miles Computing Inc.</td>
<td>32.01</td>
</tr>
<tr>
<td>Downhill Racers or Harrier Strike Mission</td>
<td>22.01</td>
</tr>
<tr>
<td>Mindcraft</td>
<td>27.01</td>
</tr>
<tr>
<td>Balance of Power or Crossword Magic</td>
<td>32.01</td>
</tr>
<tr>
<td>Deja Vu A Nightmare Comes True</td>
<td>25.01</td>
</tr>
<tr>
<td>King Of Chicago or Shadowware</td>
<td>25.01</td>
</tr>
<tr>
<td>Defender of the Twin Tower,</td>
<td>25.01</td>
</tr>
<tr>
<td>Surfth, or S.D.I.</td>
<td>25.01</td>
</tr>
<tr>
<td>The Uninvited</td>
<td>25.01</td>
</tr>
<tr>
<td>Practical Computer Applications</td>
<td>32.01</td>
</tr>
<tr>
<td>MacGol 2.0 or 6.0</td>
<td>32.01</td>
</tr>
<tr>
<td>MacRequarium</td>
<td>Special 35.01</td>
</tr>
<tr>
<td>Polish</td>
<td>20.01</td>
</tr>
<tr>
<td>Iron Chess (3D &amp; Multi-Lingual)</td>
<td>25.01</td>
</tr>
<tr>
<td>Sierra On-Line Space Quest</td>
<td>25.01</td>
</tr>
<tr>
<td>Black Cauldron</td>
<td>25.01</td>
</tr>
<tr>
<td>King's Quest I. or III.</td>
<td>25.01</td>
</tr>
<tr>
<td>Silicon Beach Software</td>
<td>25.01</td>
</tr>
<tr>
<td>Enchanted Scepters</td>
<td>25.01</td>
</tr>
<tr>
<td>Dark Castle</td>
<td>25.01</td>
</tr>
<tr>
<td>World Builder</td>
<td>25.01</td>
</tr>
<tr>
<td>Simon &amp; Schuster</td>
<td>25.01</td>
</tr>
<tr>
<td>Star Trek (The Kobayashi Adventure)</td>
<td>25.01</td>
</tr>
<tr>
<td>Silicon Mac Wonders</td>
<td>25.01</td>
</tr>
<tr>
<td>Sphere, Inc. GATO</td>
<td>25.01</td>
</tr>
<tr>
<td>Orbiter or Falcon</td>
<td>25.01</td>
</tr>
<tr>
<td>Sudoku JET</td>
<td>25.01</td>
</tr>
<tr>
<td>YEJ Screen Spy 17</td>
<td>(South East Region) 25.01</td>
</tr>
<tr>
<td>XOR Software NFL Challenge</td>
<td>25.01</td>
</tr>
</tbody>
</table>
Forms deformed? If producing a presentable form has always been a formidable task, you'll appreciate the scene on the far right. It's TrueForm™—the first and only Macintosh™-based system that lets you deftly deal with any form you feed it.

TrueForm is not just another forms software package, although it does offer you a choice of 20 ready-made forms to use. And it's not just a design-your-own-forms program, yet it lets you do that, too.

If you fill out lots of forms, lots of different kinds of forms or forms supplied by other people, TrueForm will transform your working world.

Feed any form into TrueForm's Image Scanner, and it's transmitted to your screen. Complete with logo and graphics. In seconds.

Next, you teach your computer how to fill out the form. You can supply information from your keyboard, or merge information from any database, or use TrueForm as an incredible forms-oriented spreadsheet.

Then print your perfect form with your LaserWriter® or ImageWriter®. Print the information on an original form. Or produce the entire completed form—graphics and all—on blank paper. Eliminate the problem of obsolete or out-of-stock forms inventories. Plain paper may be the only form you'll ever need again.

TrueForm makes it easy to set up a form, choosing the type font, size and style for each field. And with TrueForm you can capture and store both the forms you use and the data on them. Recall and reuse them. Save hours every day.
APUP: The Dark Side of the SE

Instead of nit-picking (I don't like the fact that the keyboard cord connects to the back instead of the front, but do you really care?), I'll go right to my main objection. I do not believe that the main purpose of the SE is to satisfy user demands. It is a machine to satisfy the demands of Apple Computer and the vision of the marketplace it would like to serve. A new Apple principle has come into play, one I shall call APUP. This stands for Apple's Plan, User's Problem.

I cannot understand Apple's perception that Mac Plus users were storming the ramparts with demands of internal hard drives and a slot. Users were ecstatic with the Mac Plus. They could choose from dozens of hard disk drives. Most chose external drives—these are often preferable because information on an internal hard drive cannot be accessed when a computer fails. As for slots, everyone knew that Apple was planning the Open Mac, the ultimate answer to the slot question. What Mac Plus owners might want in a slot—whether 68020 cards, or connections to large screens—could already be provided by a third-party product that connected circuitry to the existing Mac Plus motherboard. True, it required a dealer to install. But does the installation of a card into the Mac SE. Despite the existence of a slot, the hardware is inaccessible to users—actually dangerous to get to—so the Mac SE is de facto a closed system like the Mac Plus. (A dealer charged $40 to install the Hyper-Charger card in my SE; I suspect that this will be a minimum for an installation.) If you want to shuttle cards in and out, you'd better forget it.

My guess is that Apple felt that some of the stodgier folks who have buying power in the business community were holding out because the Mac didn't have a factory-installed hard drive and a slot to run communications to mainframes or to run MS-DOS software. It was for them, not for us (plain old users), that these changes were implemented.

Anyway, none of this explains why the SE comes in two versions—one with two floppy drives and the other with one floppy and a 20MB hard disk drive. The configuration that would allow users the most flexibility is one floppy drive, with the option of using third-party products to provide storage at lower cost and possibly higher performance. Apple's Charles Oppenheimer explains that this was done because Apple was concerned that third-party manufacturers could not provide internal hard disk drives of the necessary quality. But what about those who want an external hard disk drive? They must pay for a second floppy drive they might never use.

Apple's Plan, User's Problem is even more apparent in the new keyboard. Incidentally, the keyboard is optional with the Mac SE—ever try to run a computer without one?—with users paying extra for either the Standard or the deluxe Extended version. The Standard, which most will opt for, is lower in profile than previous Mac keyboards, like the IBM keyboard, and at first touch it seems less sturdy. But for once IBM had it right; the low angle works better, at least for me, than did the previous Mac keyboard.

The Standard's layout, though, is a disaster. The space bar is crippling short—; the Caps Lock key is banned to Lower Slobovia; there is a big, fat, unidentified key on top; and on prime real estate, just left of the A key, stands a wide Control

(continues)
Have you ever wanted the Power to Create? Now you can!

Introducing...

Crystal Paint™

Graphics for the Macintosh just entered a new dimension. Before, in order to make complex drawings, it took lots of time and even more patience. Crystal Paint has now made drawing much more fun.

Draw intricate and precise objects using any of more than 30 graphic symmetries. You can then print them or use the copy and paste options to embellish any document.

Crystal Paint has powerful editing capabilities which enable you to do precision detail work by editing one trail at a time or by importing other graphics files for manipulation.

Crystal Paint is the perfect addition to every home software library, and an essential graphics tool for anyone who does desktop publishing.

System requirements: Macintosh 512K or more.

Suggested retail price: $49.95

What You Hear is What you See

ConcertWare+ ConcertWare+MIDI

Just for Fun
You have seen music and heard music. Now you can have the best of both all in one. Even if you can't play a note, you can select any of the instruments for the ConcertWare+ Instrument Library and conduct your own orchestra. There is music already included on the disk and with a little musical background, and a sense of adventure, you can enter your own songs.

So don't be afraid to turn on your Macintosh and let your ears do the listening.

Just for Work
If you're an amateur, professional, or hopeful musician, ConcertWare+ will give you the best value in creative tools. Powerful new features include such items as enhanced real time and step time recording, staff rulers, enhanced editing and transposing, and use of the Sonata™ font. With ConcertWare+MIDI, you can record polyphonic chords. The MIDI Macros give you more control over your synthesizer than ever before. Version 4 makes composing music as easy as writing a letter.

Just for Learning
For beginner, amateur and accomplished musicians alike, ConcertWare+ allows you to experiment with music in new ways. It is a powerful tool for understanding music theory, composition, and the physics of sound.

Just for You
ConcertWare+ and ConcertWare+MIDI are the perfect programs for anyone who has ever listened to music and for anyone who just wants to give it a try.

Suggested retail price: $69.95 $149.95

ConcertWare+ now has free format text and Sonata fonts!

ConcertWare+MIDI

Great Wave Software™

Software Excellence for All the Ages

5353 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-1990

Circle 758 on reader service card
"Good things do happen when you put a little color in your life. Since I started printing on Pro-Tech Laser colors, my reports have received much more notice. And so have I." — Executive Secretary

"We’ve had a great year. I wanted my Year End Report to look as good as our sales figures, so I printed it on Pro-Tech Thermal Transfer Paper." — Marketing Manager

"We have every kind of computer printer you’ve ever heard of. Now I can get the right paper for every one of them with the Pro-Tech Computer Paper line. I really appreciate the value of Pro-Tech." — Purchasing Agent

Why people love their Pro-Tech Computer Paper.

Who wouldn’t love a computer paper specially designed for the printer they use?

The Pro-Tech family of specialty computer papers and film provides the consistency and reliability required for superior image quality and is specifically designed for dot matrix and daisywheel, ink jet, laser and thermal transfer printers as well as pen plotters. Pro-Tech enhances your printer’s performance. And your image.

The complete line includes: Laser Papers for hi-speed and desktop laser printers (in white and colors, 25% cotton and other special finishes), Ink Jet Paper, Thermal Transfer Paper, Pen Plotter Paper, Printer Papers (in bond, 25% cotton and other special finishes) and Transparency Film. You’ll love them.

Yours Free! For free samples of the right paper for your printer, contact Pro-Tech today. Return this coupon to: Pro-Tech Sampler Kit, c/o James River Corporation, Groveton Division, Groveton, NH 03582 or call toll-free Mon-Fri 8:00-5:00 EST...

1-800-521-5035
In MA: 413-589-7592

Name
Title
Company
Address
City
State
Zip
My computer printer is a
(Manufacturer - Make - Model No.)

Pro-Tech
Because the right paper and film makes all the difference

Circle 762 on reader service card
key, unusable on most Macintosh applications so far. This seems to defy explanation, until you realize that the standard keyboard for the main computer of the Macintosh line now has an identical layout to the keyboard on the Apple IIgs. Those folks have a use for control keys. And with the new Desktop Bus system used on both the SE and the Apple IIgs, you can literally swap keyboards on the machines. This must be wonderful for Apple, but it doesn’t do much for the hundreds of thousands of SE owners who will suffer with the standard keyboard. (The more expensive Extended keyboard, on the other hand, is laid out quite logically.)

Apple’s Plan, User’s Problem.

The Woes of No 020

The most glaring example of Apple’s what the Macintosh SE does not have: the 68020 chip. There has been much discussion as to why this chip will appear in the Macintosh II and not in the SE (for a good explanation, see “SE Close-Up,” MacWorld, May 1987); it boils down mostly to price, software compatibility, and Apple’s desire for product differentiation. If the SE used that chip, we are told, it would cost almost as much as a Macintosh II—and if you want that power, buy that machine. Yet rumors persist that the SE was designed to accommodate the more powerful chip, and Apple people do not deny the possibility that future versions of the SE might indeed be powered by the 020.

Would it have been so horrible to use that chip in the current version of the SE? Initially, the cost might have been significantly higher—yet SE buyers must now spend several hundred dollars more for a computer with the same memory and the same processor as the Macintosh Plus. Unlike the two prominently stated “improvements” of the SE, which at the present moment can be obtained by other measures, the inclusion of this chip would provide a tangible cost-justification.

As it is, Apple will eventually come out with the Macintosh SE Exclamation Point, or whatever it calls the 68020 version, and SE users will be faced with a costly upgrade. Mac Plus users probably won’t even have the option of undergoing that upgrade—which is why all first-time Mac buyers should go straight to the SE. So the main reason to pay extra for the SE is a defensive one: you won’t get much more performance now, but you’ll be in line for future goodies.

In some ways, these complaints do not do justice to the SE. After all, it is indeed an improvement on the Plus. There are other wrinkles that are not apparent at first glance, but will provide some steady value—like a more rugged power supply. For all I know, someone might come up with a multifunction card for the single slot that will obviate the need of opening the box again, ever.

Still, the SE represents some sort of compromise; a chance was missed. I find it odd that some people are bitterly complaining that there is no upgrade path from the Mac Plus to the SE—what possible task could they perform with an SE that they cannot accomplish with a Plus? Nor will any significant software emerge that runs on the current SE and not on the Mac Plus.

The real issue in future Macintosh compatibility will be the ability to run the new generation of software written for the Macintosh II. I’m sure that future SEs will be able to run much of that software—but not the current SE, which wins the 1987 Half a Loaf Is Better than None award. That lingering cockroach of a question, though, is “better for whom?”

Inside Out, the first relational database engine for Macintosh, reaches far beyond your highest expectations. Inside Out brings the power of a 4th generation database language to conventional Pascal or C development systems. Inside Out maintains every bit of information in a database in one Macintosh file. This file can grow as large as 256 gigabytes. Each database consists of up to 128 logical files. Three different types of logical files provide support for virtually any type of data, including variable length data. Database views allow applications to efficiently process related data, while guaranteeing data independence.

The multi-user version of Inside Out adds further to its impressive list of features, with improved record locking to extend network efficiency. Of course, Inside Out is fast!

For direct orders or further information on Inside Out, contact Shona Enterprises Inc., 200, 9704-54 Avenue, Edmonton, Alberta, Canada T6E 0A9. Telephone 403-438-6548, AppleLink CDA0004.

Macintosh is a trademark of Apple Computer, Inc.
Inside Out and the Inside Out logo are trademarks of Shona Enterprises Inc.
DON'T GET LEFT BEHIND

Just because you've come to CEPS before, don't think that the world of corporate electronic publishing has stood still. It hasn't.

Now it's more important than ever before to get a first-hand view of the newest products and innovations that are rapidly changing the state of the art.

And only CEPS/Fall can keep you ahead of the industry's latest developments and how they can affect your business operations.

Learn about the electronic publishing technology from the inside, from the leading experts and vendors in the field. Discover how to set up systems that are right for you. Dramatically cut costs, eliminate unnecessary typesetting charges and maximize the efforts of your entire staff and resources.

Whether you're in business, government or education, CEPS/Fall is the single event that showcases the continuing evolution of corporate electronic publishing. Don't get left behind...make your plans today.

CEPS/Fall...because publishing is everybody's second business.

Clip this ad...save $15 on your CEPS/Fall admission.

Bring this ad with you to CEPS/Fall...you'll pay only $5.00 to attend!

Instructions: Complete a registration form (available in the lobby), then proceed to a cashier with this ad.

Show Hours:
Monday, October 26: 10:00 a.m.-6:00 p.m.
Tuesday, October 27: 10:00 a.m.-6:00 p.m.
Wednesday, October 28: 10:00 a.m.-4:00 p.m.
Registration opens at 7:30 a.m.
A. Summary of Significant Accounting Policies

The consolidated financial statements include the accounts of the Company and its subsidiaries. There are material intercompany accounts and transactions that have been eliminated.

The following summarizes the significant accounting policies of the Company:

- Inventories are stated at the lower of cost (first-in, first-out method) or market.
- Plant and equipment are carried at cost less accumulated depreciation and amortization.
- Provision for depreciation and amortization is based on the estimated useful lives of the assets (3 to 5 years) and the computation is too based on the straight-line method.
- Revenue on product sales and related anticipated warranty costs are recognized upon shipment.

Introducing MacProof 3.0

You toil for hours getting an important business proposal just right. Only to have your boss send it back to you with more red marks on it than white space. That's not a pretty sight.

With MacProof™ 3.0, you may never see red again. MacProof is a Desk Accessory software package for the Macintosh, that points out possible errors in style, usage and the mechanics of writing. A few clicks of the mouse makes a correction. MacProof can even make you a better writer over time by indicating possible mistakes, suggesting solutions — and letting you decide what action to take.

All the proof you need.

MacProof incorporates features that can make writing a breeze instead of a burden. An 80,000 word dictionary checks your spelling. Writing mechanics such as punctuation, capitalization and double words are reviewed.

MacProof checks for problems of usage such as racist or sexist words, words that are often confused (e.g. its and it's) and imprecise or wordy writing. It even searches for problems in style such as an overuse of "be" verbs or non-standard words that make your writing less active and precise.

Extra credit.

MacProof adjusts itself to suit your writing style and problem areas. You decide which aspects of usage, style or mechanics you want checked and MacProof will check only those areas. You can even add your own usage category for MacProof to analyze. And since MacProof works as a Desk Accessory, you can check for errors, review solutions and make corrections without ever leaving your document.

MacProof can give you word, sentence and paragraph counts in a document. Other features allow you to analyze the structure and flow of a document. And MacProof works with most word processing software for the Macintosh, including MacWrite™, MicroSoft Word™ 3.0, PageMaker™, WriteNow™ and MindWrite™.

Get out of the red.

Discover how easy it is to become a great communicator and protect yourself against the red threat with MacProof 3.0. For your copy of MacProof, see your local Macintosh software dealer. Or write:

ALP Systems
295 Chipeta Way
Salt Lake City, Utah 84108
1-800-354-5656
1-801-584-3000

*See a demonstration of MacProof 3.0 in Booth 1906 at MacWorld Boston.
Circle 590 on reader service card
Verbatim

An interview with John Warnock, president of Adobe Systems.

The years you were at the University of Utah are known as its golden years. It was like the Manhattan Project of computer graphics. What was it like there?

We were doing things done nowhere else, always running down hallways to show the others what we had just come up with. It started in 1965, when David Evans, who was teaching at Berkeley, decided to go back to the University of Utah as the head of the computer science department. He brought with him a $6 million grant from ARPA (Advanced Research Project Agency) to study computer graphics. Those studies, from 1966 to 1972, were responsible for most of the foundation research in computer graphics.

There were lots of unusual people on the faculty, each with different strengths: Bob Barton, designer of one of the early Burroughs mainframes with an architecture years ahead of its time; Tom Stockton, a signal processing specialist; Ivan Sutherland, incredibly bright, an incredible problem-solver. David Evans had this way of bringing out creativity. I’m not sure how he did it, but he steered you in fruitful directions and helped you avoid the dead ends.

After university you had a number of general programming jobs. How did you get back into computer graphics?

In 1974 Evans and Sutherland had a contract to build a ship simulator for the port of New York. The U.S. Maritime Administration wanted a computer to simulate the bridge of a ship so that pilots could see New York harbor—all the way up by Long Island, under the Verrazano Bridge, past Staten Island, and into the harbors area. This was to be some of the first simulator work. They wanted to project a 180-degree view—the sun, shading, marker buoys, everything. It was about 100 square miles, had 1500 buildings, 1000 buoys, 6 types of ships, bridges. And this was to be projected in color with these old carbon arc lamps. There was no way in hell anyone could do it.

There was another problem—the hardware development was only beginning, so we had to design a database not knowing what hardware we would have to use. We had to have a computer language that described all of this stuff, and when we knew about the hardware we would use a compiler to convert it so that it could do the job. That was the birth of hardware-independent databases.

They had a three-year contract to complete the work. E&S came to me in the third year, and no work had been done yet. David Evans talked me and three other people into doing the software and the database. We actually delivered it, in one and a half years. It’s still running out on Long Island.

After your work at E&S, you went on to Xerox PARC. What was that like?

It was great. We were building program environments—the CEDAR environment. My charter in the CEDAR project was to build the graphics subsystem. It was a radical departure from the work done at PARC up to that point. CEDAR graphics were the first really device-independent protocols. You could program on a black-and-white device and run the application on a color device by changing the device driver.

(continues)
At PARC you also developed InterPress, which could be called the first page-description language. How did that come about?

At PARC Martin Newell and I wrote JAM, a PostScript-like language, to experiment with graphics and imaging models for printers. At the same time, in 1981, a graphics group was formed in the computer science lab at PARC. Bill Paxton, Chuck Geschke, Doug Wyatt (on the CEDAR team), Frank Crow, Maureen Stone, Martin Newell, and I were to explore the intersection of graphics and electronic publishing.

The team of Chuck Geschke, Robert Sproull, Butler Lampson, Brian Reed, and I designed InterPress. We decided that the JAM language was the right model for printing protocols and that CEDAR was the correct graphics imaging model.

What happened to InterPress?

Chuck and I spent a year and a half trying to sell Xerox corporate on InterPress, and we succeeded. But then Xerox decided not to publish the specifications of the language, that it would be held completely confidential, indefinitely. The imaging model was dismembered, compromises were made, and the standard was diluted. It had to be retrofitted to the base of Xerox products in the field.

We were enormously frustrated. Our hope for an industry standard was doomed, and it wasn't clear that image processing on printers would ever make any real headway.

How did Adobe get started?

We continued at PARC through 1982, and then in late 1982 Chuck Geschke and I founded Adobe in Mountain View—in the same old building we had at E&S. At first we had the same business plan as Interleaf, Viewtech, and Xyvision—to build workstations to do publishing.

Adobe's goals are very different now.

What happened?

We came to our senses. We saw that there were large companies spending time and money on laser printer research—with large budgets for research and development on graphics printing problems. We said, Gee, we know how to do that.

It seemed logical. Why should we do everything—build workstations—when others were doing that? We decided to build laser printer software and build off what others were doing.

When did PostScript appear?

In early 1983 we talked to Steve Jobs and formulated a product concept. In late 1983 we entered into a contract with Apple. The LaserWriter was developed in 1984, and in 1985 it was introduced.

The LaserWriter was a revolutionary product. What were the problems with its development?

Well, Apple was going to kill the LaserWriter in late 1984 because there appeared to be little or no profit margin at $7000. It was saved by Steve, who loved the technology. You'll remember that at $36 apiece for 256K RAM chips, the price for the printer appeared to be $7000 to $12,000, with little or no profit margin. Then the price of RAM started to decline, so there would be a little profit if it was sold at $7000.

There were some people at Apple who didn't think it would sell. We said, Trust us, there are other laser printers selling for $20,000 that don't have as much capability. Then Steve got one in his office, and other people saw what it was capable of and wouldn't use anything else.

(continues)
In today's computerized world, the concept of craftsmanship is still very much alive.

At Adobe, man and computer work as a team to craft type true to the originals.

Because at Adobe, we still strive to meet time-honored standards.

A good example is the Adobe Type Library.

The Adobe Type Library is created in a modern setting, using sophisticated computer software. And

To ensure that each type face in the Adobe Library is true to the original, we carefully study a wide range of historic type reference material.

The people who perform this task are much like the "punch cutters" of another era... each letter in a type family is painstakingly examined, manipulated and refined until, at last, it's as close to the original as humanly possible.

Indeed, the human factor, even in a highly technical environment, is the driving force in creating a type library that is true to the originals.

Naturally, this takes time. But it's time well spent because you can be sure that each Adobe typeface not only looks and feels like the original, it reproduces perfectly, regardless of the resolution of your PostScript printer.

We often do not realize how much time is spent to achieve perfection. At Adobe, we spend hundreds of hours practicing an art that has been performed for centuries.

Craftsmanship does have a place in the electronic age. Because at Adobe we practice it every day.

Adobe Type Library for PostScript® Printers.

The Original.
When people say PostScript is slow, they’re comparing it to a daisy wheel printer.

What is the future of PostScript?

The future of PostScript is color, facsimile, international printing and gray-scale printing, non-roman printing (such as kanji), and as a display language. The goal of the company is to bring graphic-art quality to computer printing, and to bring computer printing volume to graphic arts.

We look at PostScript in two parts: as a language and as an imaging model. In building an imaging model, we’re interested in how graphical objects are defined, filled, and rotated, how lines are drawn, fonts treated—basically, how ink goes onto paper. Then we can take the imaging model and put it into a language—say C or LISP—and build a set of library functions.

PostScript, as a display system, would support programs with a set of subroutines for graphics cards. These routines would draw lines, fills, and other things the same way the printer handles them. Since PostScript is device-independent, there is no concern with the pixel standard of the display or whether it’s color or black-and-white. The software will generate the display regardless of its characteristics.

Many questions have been raised about the performance of PostScript.

That’s because there’s nothing to compare it against. When people say it’s slow, they’re comparing it to a daisy wheel printer. You send a daisy wheel printer a job and it starts immediately, but PostScript doesn’t. In truth, you have asked to run an enormous number of calculations from the printer.

Take the example of a CAD/CAM drawing. A complicated drawing of a printed circuit may take 18 hours to plot on a Gerber photoplotter. Against that, PostScript looks very fast. If we lay out the circuit drawing with PostScript and send it to a Linotronic 300, it takes 3 hours to plot. The Linotronic costs $50,000 and the Gerber photoplotter is $150,000.

Lately people have been talking about a “personal LaserWriter,” in which the CPU of the Macintosh acts as the PostScript processor. What are the possibilities for that, and what are the problems involved in having the computer do the calculations now done by the LaserWriter?

The processor has to build fonts, compose the page, and move the application out of the way so that there’s room in RAM to build a bit map of the page. To do that on the Macintosh’s CPU you’d have to swap the application out of memory to do printing, then swap it back in, slowing everything down. Also consider that the LaserWriter has a lot of special built-in tricks to do printing—it’s not just another Mac in the printer engine. It has a different memory organization, and it has the ability to do some calculations at twice the speed of the Mac. It can build a bit map three times as fast as a Mac can.

Then think of the amount of data you’d have to transmit to the printer. You’d need 20 to 35 times more throughput than AppleTalk now has to drive a dumb printer. Even if you increase the bandwidth of AppleTalk, the computer would be tied up to control the network. For Apple it made sense to put PostScript and a CPU in the printer.

When will we be able to send pictures—halftones—across AppleTalk?

I don’t know. We’ll need faster networks first. Even on Ethernet, big pictures of several megabytes take several minutes to transmit. Sending good gray scales across a network will require efficient compression algorithms.

(continues)
ARE YOUR DOCUMENTS MISSING THE PROFESSIONAL TOUCH?

Discover Ragtime 2 Document Processing

Thousands of serious business professionals have already discovered that only document processing contains all the tools needed to create impressive proposals, reports, financial presentations, manuals, even annual reports. The secret of Ragtime 2 is that the elements of word processing, spreadsheets, desktop publishing (page layout), and graphics management, seamlessly co-exist on a single page. As never before, you can freely move through the document updating numerical data and formulas, processing text, altering formats and redefining page layout. All at one time, all in one program! This is the Ragtime professional touch.

Business Has a Choice

To choose software for document processing, you naturally set high standards. You must have superior page layout (MS WORD doesn’t). You demand word processing (sorry, PageMaker). You require spreadsheet (RSG3! stops short). And finally, you need a fluid ease-of-use, which only comes from software where everything has been carefully integrated.

MacWorld magazine made it clear, “Ragtime’s number crunching power and page processing versatility are well suited for the production of business plans, financial plans and technical documents.”

For premier document processing software, Ragtime 2 is the choice for business professionals.

The Tech Side

Just in case it all sounds too good to be true, we aren’t afraid to give you the technical specifications. Ragtime 2 has automatic hyphenation, spell checking, kerning, full spreadsheet with 253 x 253 cells, overlapping frames, automatic text wraparound, snap-to grids, color and gray scales, mail merge, import TIFF and EPS graphic files, import Excel, Word, and MacWrite files, interlinked spreadsheet, 55 mathematical formulas, forms generation and more.

Order Now: 30 Day Money Back Guarantee

We guarantee it so you can’t lose. To order direct from Orange Micro call:

(800) 223-8029
(714) 779-2772 in CA

Or contact your dealer for a demonstration.

Special Opportunity to try Ragtime

Send a check for $10 or call us with your favorite charge card. You’ll receive:

• A Ragtime Evaluation Disk
• Sample Documentation
• FREE Mouse pad ($10 value)
Can PostScript displace QuickDraw as a display language? You've said you intend to provide PostScript as a screen language, and Sun Microsystems already has an implementation under its News windowing environment. And I've noticed that Apple seems to have slowed down its development of QuickDraw.

I have no idea whether Apple will ever replace QuickDraw with PostScript, but other computer companies have expressed an interest in using PostScript as a display language. I can say that the imaging model in PostScript is much richer than that of QuickDraw, and I think that even the people at Apple would agree with that.

We already use PostScript as a display language in Adobe Illustrator [Adobe's graphics software]. We have a PostScript kernel driving the screen, and it works very quickly.

PostScript seems like a way to tie together the new generation of workstations—Apple and IBM. Is that possible?

Yes. The Encapsulated PostScript File format allows files to be traded among different CPUs. EPSF is a PostScript file that describes a complex image. Several graphics and desktop publishing programs already use EPSF—Adobe Illustrator, Cricket Draw, ReadySetGo 3.0, Quark's XPress, and several of the scanner companies. PageMaker and Microsoft Word read it.

IBM recently announced that its new laser printer will use PostScript. What does that mean for its new machines and for the OS/2 operating system?

IBM announced a PostScript driver card for only the old line of machines—the PC-DOS machines. IBM has not announced that its new machines will run PostScript, and I do not preannouce IBM's plans.

What are the especially exciting areas of development for Adobe?

Well, there's nonroman printing. We have an agreement with Morisawa, a Japanese font manufacturer, and we're talking with several printer companies in Japan. We have a contract with NEC Information Systems for the United States, and NEC may be interested in extending it to Japan.

Printing Japanese is a big deal. There are over 7000 characters per alphabet, therefore you need a printer with a hard disk and lots of memory to support that—something like the Agfa-Gevaert 400-dpi printer, or the Linotron 100 and 300.

(continues)
The Next Generation of Macintosh Graphics Software Has Arrived.

LaserPaint, The Integrated Graphics Workshop

**Drawing**
- Full featured PostScript illustration program
- Circles, squares, curves, arcs & spirals
- Filling of shapes with patterns or screens
- Positive & negative masking
- Custom dashed lines, line joinings, & line cappings
- Line widths from 1/8 point (1300")

**Painting**
- Full editing of imported bit-maps at 600 dpi
- Airbrushing at 600 dpi
- Adjustable Airbrush "rate of flow" and "diameter"
- Grey scales & fountains
- Configurable pens, brushes & markers
- Drawn objects used as hard masks or soft shields
- Eight zoom positions in any mode

**Writing**
- Runaround text justified inside or around any object
- Text on any defined path: lines, circles, objects
- Full kerning & positive or negative leading
- Font sizes up to 511 point
- Full editing: multistyle, multisize and multiformat

**Import/Export**
- Import Bit-maps from Paint programs
- 300 dpi scanned images in TIF format
- Text files from word processors
- Use the scrapbook & clipboard
- Export pure Postscript text files
- EPS, Encapsulated PostScript files
- Edited, enhanced & modified bit-maps

**Layout/Paste-up**
- Multi page working surface: eight 8.5 x 11 pages
- Configurable or standard column guides
- Artwork may cross page boundaries
- Automatic printer's registration marks
- Positive & negative printing capabilities
- Printers Overlays and job sheets

**Color Separations**
- 4-color process or line-color
- Automatically on LaserWriter or Linotronic
- Printers registration marks for alignment
- Automatic adjustment for coated/uncoated paper
- Color enhance & separate imported bit-maps
- Drawing, page or poster size output

**For additional information see your local computer dealer or call:**

- 800-367-6898 (Toll free)
- 415-453-9500 (In Calif)

**Suggested retail price:** $495.

LaserWare, Inc.
P.O. Box 668
San Rafael, CA 94915

**LaserPaint™**
The Integrated Graphics Workshop
DRAW • PAINT • TEXT • PASTE-UP

LaserPaint is a trademark of LaserWare, Inc. Other brand or product names are trademarks or registered trademarks of their respective holders. © 1987 LaserWare, Inc.

Circle 664 on reader service card
This printer would be the equivalent of the LaserWriter in Japan?

Yes. A Japanese equivalent will be announced, probably in the second half of 1988.

What about gray-scale printing?

There are no gray-scale printers yet, and for good reason. You might have the world's best gray-scale printer, but you would still have to screen the image to produce a half-tone. Gray-scale printers would be useful only for one-time printing, not for making masters.

Will Adobe support color?

Yes, when we believe in a strategy, then we pursue it. We are showing our color capabilities to interested OEMs.

Different technologies for electronic color printing come and go, but they never really catch on—with good reason. Color printers that sit on the desktop do exist, but

if I want to include the output in a publication or a report, I have no way to reproduce the image. I can send it out for color separation and printing, but the cost and quality of that don't match up to what I can do with more traditional methods.

People do want to be able to produce color proofs. We're working on a 300-dpi thermal color printer, and we will be able to produce final color separations on Linotronic printers with the same set of data files. People in ad layout and brochure development could use this type of system to proof their color pages. The cost of a color proof will drop, from about $150 (Chromalin costs) to about 10 to 50 cents per page.

What about facsimile for the Mac?

That's very important. There are over 10 million fax machines out there. Most facsimiles look bad because of sampling errors associated with the input device. Images are scanned in at 200 dpi, compressed, transmitted, and then output on a device that amplifies the earlier errors.

This is not a product announcement, but if you had a PostScript device that could originate documents, you could send the document as a PostScript file to a remote fax machine. If the output machine—the fax printer on the other side—could interpret PostScript files, it could print the facsimile at any resolution from 200 to 1200 dpi.

You can do all that now with a modem, but the trick is to make the process transparent to the end user—add information to the Print dialog box that would allow a LaserWriter to write to a remote fax device. We've seen something like this already. Volvo published its car manuals in Sweden and sent the entire document to the United States as PostScript files via ordinary phone lines.

The volume of in-house typesetting is increasing, but is this just a repeat of history? When phototypesetters were introduced, lots of companies that had been having their publications done by graphics professionals thought they could start doing their typesetting in-house. Then, after they'd bought all the equipment, they decided to go back to professional typesetters.

(continues)
PROJECT BILLING

Project Billing is a time billing package designed for all agencies, graphic designers, architects and engineers. This package will track all aspects of your project billing including budgets for time and expense, actual costs and billed out amounts for both employee and expenses, and project profitability.

It will also automatically mark-up expenses, and provide productivity reports by employee or project, plus print your client bills in a variety of formats.

This is how Project Billing can help you office:
- Tracks employee productivity by cost and billable rates
- Automatically marks up expenses
- Provides profitability analysis by project
- Tracks budgeting of time and expense
- Prints bills and adds interest
- Work-In-Progress holds detail from month-to-month
- Enables progress (partial) billing, while holding all detail
- Multi-user option available

$695.  $1095.  Project Billing +
- Multi-user version

BULK MAILER

NEW VERSION! BulkMailer is a powerful program specially designed for managing lists. BulkMailer does everything you want in a mail list program, including duplication elimination, zip and alpha sorts, 1 to 1 up labels printed, easy-entry defaults, multiple label format, plus, much, much more.

This is the only program to offer all these features:
- Duplication elimination
- Zip or alpha sort
- Car-return or ship + 4
- 1 to 1 up labels or roster format
- Powerful coding capabilities
- Sophisticated global editing and deleting
- Mail merge with Microsoft Word
- Easy-to-use entry defaults
- Coding and date expiration fields
- Large record capacity (up to 90,000 names)
- Hard disk compatible

Now shipping version 3.0
$149.  BulkMailer
- up to 8,000 names
$350.  BulkMailer +
- up to 90,000 names
From the creators of Macworld comes the premier newsweekly for the Macintosh community.

*Macintosh Today* is happening — now!
Written for business users who need up-to-date information on Macintosh products, applications, and industry developments.
The hottest newsmagazine in the Macintosh market premieres August 11 at the Macworld Expo in Boston. Don't miss out!

*Macintosh Today* will feature:
- Industry news
- Trends and emerging markets
- Technical analysis and solutions
- Up-to-the-minute product reviews

*Macintosh Today* - the ultimate source for Macintosh news and information

- To become eligible to receive *Macintosh Today* regularly, complete the facing reader qualification card and return promptly.
- If you wish to receive extra reader qualification cards, call 800/351-1700 toll free.

Send in your qualification card today!
Please accept my request for a free subscription to MACINTOSH TODAY.

Signature ____________________________

Date ________________________________

2. Title (check only one)
   □ 1. Chairman/president/owner/partner
   □ 2. Vice president
   □ 3. Controller/treasurer/accountant
   □ 4. Director/supervisor/manager
   □ 5. Project manager/chief/group leader
   □ 6. Art director/writer/creative head/technical writer
   □ 7. Engineer/scientist
   □ 8. Administrator
   □ 9. Consultant/advisor
   □ 10. Microcomputer specialist/manager/analyst
   □ 11. Programmer
   □ 12. Educator
   □ 13. Professional (lawyer, doctor, etc.)
   □ 99. Other (please specify) ________________

3. Department or function (check only one)
   □ 1. Accounting/finance
   □ 2. Administration/management/personnel
   □ 3. Consulting
   □ 4. Education/training
   □ 5. Engineering/R&D
   □ 6. Manufacturing/production
   □ 7. Microcomputer center/office automation
   □ 8. MIS/DP
   □ 9. Purchasing
   □ 10. Sales/marketing/distribution
   □ 99. Other (please specify) __________________

4. Does your company own or lease any mainframe computers at this location?
   □ Yes □ No

   □ 1. IBM
   □ 99. Other (specify) __________________________

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?
   □ Yes (indicate quantity below) □ No

Manufacturer

Currently own (quantity) Plan to buy within

1. Macintosh
   □ 128/512
   □ 256/1024
   □ 512/2048
   □ 1024/4096
   □ 2048/8192
   □ 4096/16384
   □ 8192/32768
   □ 16384/65536
   □ 32768/131072
   □ 65536/262144
   □ 131072/524288
   □ 262144/1048576

6a. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply):

   □ 1. Approve purchase
   □ 2. Develop/manufacture
   □ 3. Evaluate/select vendor
   □ 4. Own (at least one)
   □ 5. Own (two or more)
   □ 6. Purchase or acquire
   □ 7. Establish specifications
   □ 8. Recommend to others
   □ 9. Sell
   □ 10. Train people to use or provide support
   □ 11. Use
   □ 12. No involvement
   □ 99. Other (please describe by name and quantity) __________________________

If you have no involvement with any of the above, skip to question 8.

6b. For approximately how many total personal computers or microcomputer systems do you have the above involvement? (check only one)

   □ A: 1-3 □ B: 4-9 □ C: 10-19 □ D: 20-49
   □ E: 50-99 □ F: 100-499 □ G: 500+

7. For approximately how many Macintosh personal computers do you have involvement described in question 6 above? (check only one)

   □ A: 1-3 □ B: 4-9 □ C: 10-19 □ D: 20-49
   □ E: 50-99 □ F: 100-499 □ G: 500+

(Over please, additional questions on reverse side)
8a. How many people work at your location? (check only one)

- 1. 1-9
- 2. 10-24
- 3. 25-99
- 4. 100-499
- 5. 500-999
- 6. 1,000 or more

8b. How many people are employed by your entire company? (check only one)

- 1. 1-9
- 2. 10-24
- 3. 25-99
- 4. 100-499
- 5. 500-999
- 6. 1,000 or more
- 7. 5,000-9,999
- 8. 10,000 or more
- 9. 10,000 or more
- 10. 50,000-99,999
- 11. 100,000 or more

9. What percentage of people who work at your location actually use a personal computer (check only one)

- 1. Less than 25%
- 2. 25-49%
- 3. 50-74%
- 4. 75-100%
- 5. None

10. The personal computer purchased for this location would be (check all that apply):

- 1. For internal use
- 2. For resale
- 3. Other (please specify)

11. How are personal computers normally obtained for this location? (check all that apply)

- 1. Direct from manufacturer
- 2. Manufacturer's representative
- 3. Distributor or wholesaler
- 4. Retail computer store
- 5. Mail order
- 6. VAR/systems house
- 7. In-house (company or university store)
- 8. Other (please specify)

12. Personal computers or microcomputer systems at your location are or soon will be used for the following communications activities: (check all that apply)

- 1. Communicate with internal company mainframe or mini
- 2. Communicate with other micros via modem
- 3. Communicate with outside mainframe or mini through service bureau, database or time-sharing service
- 4. Local area network
- 5. Voice/data
- 6. None of the above
- 7. Other (please specify)

13. Are you involved in any of the areas shown below? (check all that apply)

- 1. A. Recommend
- 2. B. Influence
- 3. C. Specify
- 4. D. Buy
- 5. E. None

- Software
- 1. Spreadsheets
- 2. Word processors/outline processors
- 3. Database management
- 4. Accounting
- 5. Statistics
- 6. Communications/networking
- 7. Graphics
- 8. Presentation
- 9. Project management
- 10. Desktop publishing
- 11. CAD/CAM
- 12. Programming language
- 13. Back-up systems
- 14. Utilities
- 15. Other

- Peripherals
- 16. Dot matrix printers
- 17. Laser printer
- 18. Local area network
- 19. File server
- 20. Optical disk
- 21. Monochrome monitor
- 22. Hi-res color monitor
- 23. Add-on board
- 24. External hard disk
- 25. Internal hard disk
- 26. Back-up systems
- 27. Modem
- 28. Other

- Computers
- 1. Personal computers
- 2. Multiuser microcomputers
- 3. Laptop microcomputers
- 4. Portable microcomputers
- 5. Engineering workstation
- 6. Minicomputers
- 7. Mainframe computers
- 8. Others

- Outside services
- 1. On-line services
- 2. Education/training
- 3. Maintenance
- 4. Custom application
- 5. Service bureau
- 6. Other

14. Over the course of one year, how would you quantify your level of involvement in total microcomputer systems products?

- 1. A. Recommend
- 2. B. Influence
- 3. C. Specify
- 4. D. Buy

- 5. Less than $10,000
- 6. $10,000-$24,999
- 7. $25,000-$49,999
- 8. $50,000-$74,999
- 9. $75,000-$99,999
- 10. None of the above
Mouse Cleaner 360°'s Magic Scrubber Ball gets your mouse squeaky clean in seconds!

- Makes messy cotton swabs obsolete.
- Keeps your mouse operating like new!!

ERGOTRON, Inc.
1621 E. 79th Street
Minneapolis, MN 55420
612/854-9116 • Telex #4310015

Mouse Cleaner 360° Kit —
Just $16.95 at your Computer, Accessory or Office Supply Dealer.

Circle 626 on reader service card

Mouse Cleaner 360°

Solve Mac problems like an expert!

"1st Aid Kit" falls into that special category of "must-have" products (MACazine, April '87). It lets you handle every Mac problem from difficulties copying files, printing, and using AppleTalk networks, to recovering lost data from deleted or damaged files and unreadable disks.

Acclaimed by novice and expert alike, the 1st Aid Kit is much more than powerful software. At its core is a clearly written reference manual that:

- lists every imaginable error condition
- helps you quickly track down solutions to any problem
- takes you step-by-step through each recovery effort
- shows you how to avoid problems

"The definitive product for troubleshooting on the Macintosh" (MACworld, April '87). It "stands head and shoulders above any other product like it ... I can't recommend 1st Aid Kit strongly enough" (MACazine, April '87).

1st Aid Kit

$99.95

HFS Version: MacPlus, Mac SE, Mac II
MPS Version: 128KMac, 512K Mac, MacXL

Available direct order 24 hrs.
1-800-THE-FIXR
In MA 617-847-4190
VISA & MC accepted, 55 c/s UPS ground, in MA add 5% tax
Not copy protected
Dealer inquiries welcome

InterViewed by Jerry Borrell

Macworld 89
It's never past our bedtime. Long after the other companies have gone home to watch their TVs, we're still here watching our phones. We do it 24 hours a day, seven days a week.

It's not that we really expect any calls. In fact, we've gone to great lengths to avoid them. We've made our products so easy to use, and our manuals so clear and concise that the only reason you'll want to call is to place another order. And another. And another.

But if someone in your company should have a question or need advice it's nice to know that MASS+MICRO Systems is here working for you. We're ready to give the kind of professional, first-rate service that our competition is home dreaming about.

Now for something really great. All of our products carry a full one year warranty, and our memory expansion products carry an unsurpassed lifetime warranty. Your company also receives a 48 hour turnaround on repairs and an incredible 30 day money back guarantee.

We also give you the added option of purchasing any of our four different support levels, so you're sure to find one that meets your company's exact needs.

How do you get this support? Simple. Just purchase any of MASS+MICRO Systems quality products:

**The MASS+PLUS™** Now you can add our MASS+PLUS to your Mac Plus and gain a whopping 2Migs of memory, with room to expand your system to its full 4Meg potential. Just plug it into the Apple's memory sockets — no soldering, modifications or headaches here. And like Apple we're using the very latest SIMM technology combined with the new low powered megabit chip. Nothing but Apple standard.

**The MASS+PAK™** If you own a Mac SE or a Mac II, our MASS+PAK will give you the ability to run huge spreadsheets and more advanced graphics. By using the same SIMM technology and Megabit chips as our MASS+PLUS you can give your Mac SE the 2Meg advantage. Add another MASS+PAK and get 4 Megas total. If you have a Mac II you can purchase four Mass Paks and bring your Mac up to a full 8Megas. If you have got a Mac Plus just combine the MASS+PLUS and a MASS+PAK for the power you've been dreaming of.

Of course the MASS+PAK is internal drive and large screen compatible. Neither we or our friends at Apple would want it any other way.

**The MASS+STORAGE™ family** If your company is looking for reliable, quiet and fast hard drives, we have them — from 20 to 160Migs. Three-way surge protection, shock absorbers, and an optional built in modem are just some of the features our drives offer.

At about 2" high, our drives come in either sand or the new platinum color. They fit perfectly under your Mac and look like they belong there. And they do.

So go ahead. Plug one in along with one of our memory expansions to create the perfect couple, MASS and Mac.

**More about us** At MASS+MICRO Systems we've been working late to give your company the very best products and support available to Mac owners today.

Keep an eye on us as we continue to work with Apple, to provide quality products at affordable prices for the future of your Mac and its accessories.

So while MASS+MICRO Systems is becoming a major part of the Macintosh evolution, others are just sleeping through it.
**Making Inroads at JPL**

At NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, the Macintosh has become an important tool for engineering teams that are planning a distant rendezvous with an icy comet, performing orbit analysis for the Voyager and Galileo missions, and improving the control and sensitivity of robot arms used to perform scientific functions in remote space.

JPL is among the top ten volume purchasers of Macintosh computers nationwide, and even has its own Macintosh user group. The Macs have been used primarily for preparing the scientific reports and presentations that are crucial for pushing design projects through to completion. Project teams will commonly present two or three review presentations each year, which often require 20 to 40 view graphs for overhead projection. Since each graph costs between $100 and $200 to prepare by traditional methods, a Macintosh desktop system pays for itself within months, according to Godfrey DiGiorgi, president of JPL's user group.

When DiGiorgi got his machine in August 1985, JPL had only about 25 Macs. Now, he estimates the total at over a thousand. In the near future, he expects to see Macs become an integral part of JPL's scientific effort. As more and more Macintoshes enter JPL's labs and as its engineers discover the increased power, memory, and configuring flexibility of the Mac II—they keep finding new ways to exploit the Mac's capabilities.—Paul Shaffer

With the new AP Graphics-Net broadcast system, newspapers will automatically receive graphics files on their Macs within seconds of transmission. If the receiving Mac is in use, a scrolling message indicates that the file is being stored in the background.

Using proprietary software developed by Solutions, Inc., of Montpelier, Vermont, the system links a modified AP receiver through the modem port of the Mac at 9600 baud. Solutions' *Glue* software is incorporated into the AP system so that receiving newspapers will not necessarily need the various Mac application tools that AP artists use in generating graphics. The challenge of creating the AP system, according to Solutions' president Tom Evslin, is in devising a one-way satellite link, which won't allow the Mac to put a transmission on hold until the computer is no longer in use. File blocks are checked for errors, and good segments are automatically merged from the two transmissions that occur.

(continues)
Power to see your best.

See us at Macworld Expo Booth 540!

The 827,392 pixel window of opportunity

If you are a designer, engineer or a professional in business, marketing or sales you have probably discovered you can work faster and communicate better with a Macintosh.

Add The Big Picture™ from E-Machines and you open new vistas of power. Here is the opportunity to see your best work unfold. The Big Picture displays a 1024 by 808 pixel desktop that shows you over four and a half times more information than the standard Macintosh screen, or almost three times as much as either of the optional screens for the new Macintosh II.

Engineered to be the most Macintosh compatible

The Big Picture is the ideal large screen for your Macintosh. We have carefully designed and engineered all the major systems from the ground up. The hardware, the software, the ergonomics. Because we designed it right, from the start, following all the Macintosh rules, you get the most Macintosh compatible large screen monitor on the market.

The Big Picture supports all standard Macintosh software. Plus, it’s compatible with the leading high-performance add-ons. Like Hypercharger-020™ from General Computer and TurboMax™ from MacMemory; products from Leco, Dove, and more.

In fact, one of the most tangible statements about E-Machines’ commitment to engineering quality can’t be seen on the screen at all. You have to look behind The Big Picture to see the FCC “B” certification stamped right on the back.

That’s the highest rating attainable. Rather than settle for the easier to get Class “A” certification, we pushed ourselves for excellence. Class “B” demands rigorous engineering and is reserved only for products that exceed tough standards. Products like The Big Picture and the Macintosh.

The Big Picture is upgradable to work with any Macintosh

The Big Picture is available now for all Macintosh models, including the new -SE and -II. And it’s good to know that The Big Picture you buy today can be upgraded to work with the Macintosh you may buy tomorrow. Even if you have your sights set on one of Apple’s new “Open Macs” or portables from Dynamac™ and Colby™.

See for yourself

Ask your Apple® dealer for The Big Picture. Dealer installation is quick and easy. There’s no drilling or soldering which keeps your Macintosh neat, clean and portable as ever. The Big Picture and Macintosh. The power to see your best.
AP is a member cooperative of about 90 percent of this country’s dailies, or almost 1400 papers. About one thousand of these subscribe to the AP photo network, which has traditionally carried hard-copy facsimile transmissions of news graphics. Macs are used by about 700 to 800 of those papers.

AP-member newspapers will be encouraged to contribute their own graphics to the network. The system is also likely to become a Mac graphics distribution utility for other news syndicates and business users.

AP GraphicsNet will vastly improve the resolution quality of graphics for newspapers receiving the actual Mac files instead of facsimile transmissions and will allow graphics to be locally edited. In the long term, an all-digital information transmission system could lead to the merging of words and images into complete page layouts that might even include national advertising—all sent to newspapers in finished form.

—Stuart Silverstone

Games for Any Budget

Jasmine Technologies of San Francisco has announced a 10MB removable-cartridge disk drive for the Mac. The MegaDrive, based on technology developed jointly by Data Technologies Corporation and Kodak, offers the performance of a hard disk along with the advantages of removable media.

Because cartridges for the drive consist of a 5¼-inch floppy disk with a rigid hub, enclosed in a hard plastic jacket, they are more akin to the Mac’s 3½-inch floppies than to the IBM PC’s 5¼-inch floppies. The cartridges sell individually for $39.95, or three for $109.95.

The $999 MegaDrive connects to the Mac’s SCSI port and has an average access time of 65 milliseconds. According to Jasmine’s Dennis Trager, the drive is far speedier than a floppy and is almost as fast as a SCSI fixed-media hard disk.

—David Usbfjima

The MegaDrive’s 5¼-inch floppy disks offer portability at near-hard-disk speeds and capacities. Data on the 10MB floppies last ten times longer than on Bernoulli-technology cartridges.

The $999 MegaDrive connects to the Mac’s SCSI port and has an average access time of 65 milliseconds. According to Jasmine’s Dennis Trager, the drive is far speedier than a floppy and is almost as fast as a SCSI fixed-media hard disk.

Cardplayers will enjoy Hearts 2.0 (J. Harold Spangler, Arnold Epstein; free). The Mac plays three hands to your one, and the program allows you to choose from a large number of game variations. Golf 1.0 (Michael A. Casteel, Dave Edward; $10) is not an electronic version of golf but an unusual variation of solitaire. Two other popular solitaire programs by the same authors, Klondike 3.3 and Canfield 2.0 ($10 each), have been upgraded to include a casino scoring option, which puts a dollar value on your success. In addition, the cards for both games now appear in color on the Macintosh II.

Derivative games are not restricted to cards. Gamsby (E. C. Horvath; free) is much like the immensely popular Shanghai, except for the Macintosh-icon playing pieces and the ornamented playing board. Amp 3.0(B2) (Paul A. Perkins; free) uses the classic Macintosh public domain game Daleks as its model. Unlike Daleks, however, Amp uses a complex, always-changing maze as the playing field, and it’s more challenging and unpredictable.

With Memory 2.0 (Jean-Paul Paulin; $10), which is based on the pair-matching game of Concentration, you can choose from a variety of picture sets and skill levels for your computer opponent. And 1000 Miles 1.1 (Robert Harris; $10) is a faithful (and addictive) reproduction of the Parker Brothers card game Mille Bornes.

Action games include Crystal Raider (Patrick Buckland; $10), a challenging mouse-controlled space game from England. Iggy Iggoopolis 1.1 (David Bayard; free), which requires extremely fast reflexes, is a cross between

(continues)
Finally, disk drives that offer the advanced power and elegant design at the price you’ve been waiting for.

**BOOK Disk Drive**
- Extremely Quiet
- LED (so you know the silent drive is running!)

**30% LOUDER**

Comparison of 800K External Drives

- Manual eject button
- Compatible with old and new Mac ROMs — use on standard 512K
- Compact case matches Mac aesthetics
- 12 month warranty (four times Apples!)

**20MB and 40MB SCSI Hard Disk Drives**
- Smallest drives available — completely portable
- Head-locking safety feature, rated 60 Gs
- Mean failure time of 25000 hrs.
- SCSI port available for 512K Macs
- 12 month warranty


**Ehman Engineering — The Dependable People**

Like hundreds of companies have for years, you can depend on Ehman Engineering for the finest Macintosh peripherals at unbeatable prices. (Ask about our top-quality memory upgrades and 512K SCSI port for the Mac.) We take pride in our work, which is why all Ehman products are elegantly designed inside and out, and come with a 12-month warranty. And we take care of our customers, which is why you’ll always find a friendly, knowledgeable person on the other end of our 800 number.

Call us today for details on the complete Ehman product line. We’re looking forward to talking with you.

**Ehman ENGINEERING, INC.**

115 Apache Drive, Evanston, WY 82930

(800)257-1666
the once-popular Pac-Man and Qix arcade games. In the surreal BMX-The Racing Game 1.0 (David Bayard; free), you negotiate an obstacle course through an editable geometric landscape. And Duck Hunt (Edgar Circenis; free) is just what it sounds like; select a buzzoka and a flock of (soon-to-be) extinct birds for a relatively easy time of it, or go gunning for mallards with a shotgun in hurricane-force winds to test your mettle. —Robert C. Eckhardt

Realities Strikes

Once you scan in an image at 300 dots per inch, your editing options are limited. Although many 300-dpi scanners include software that enables you to alter scanned graphics, you are generally confined to editing a small magnified section of a drawing pixel-by-pixel. If you’re the type who enjoys building a fully rigged schooner in a bottle or inscribing the Declaration of Independence on a grain of rice, you probably don’t mind editing graphics this way. Otherwise, you no doubt long for a better way to enhance scanned high-resolution graphics.

Fortunately, help is on the way. A forthcoming program from Letraset, code-named The Realist, offers a multitude of tools for editing PostScript gray scales. The Realist’s tools must be used to be believed; most bear an uncanny likeness to the real-life tools they emulate. Perhaps the most impressive is the Water Droplet, which blurs sharp edges, causing grays to bleed together as in a watercolor painting. The fingerprinting tool is equally realistic, smearing gray tones in the direction a finger icon is dragged (an option that even leaves a residual dab of “paint” on the finger to smudge anywhere on the page). The paint bucket fills areas with a single shade or a fountain of shades that blend from one gray to another. A brush paints in one of the palette’s 64 grays; choose among a variety of preset tips or create a set of custom ones, including an airbrush. A charcoal stick darkens an area; the more you rub, the darker the area becomes.

The Realist lets you work on an image at its actual size or magnified by a factor of 2, 4, or 8. Not only can you alter an illustration with the program’s drawing and painting tools, but you can also modify the entire image with a number of controls. The brightness and contrast sliders allow you to make minute adjustments in overall shading or to achieve special effects such as negatives, filters, and posterezations. Menu items let you crop, flip, rotate, or invert a picture. You can also work on selected areas of an image, darkening or lightening a section or sharpening the edges.

Letraset claims that when released, The Realist will interface to several popular 300-dpi scanners, allowing users to scan images from within the program. Images can be saved in EPS or TIF format, and should therefore be compatible with page-layout programs such as PageMaker and Ready SetGo. A few hours with a prerelease version provided a tantalizing glimpse of The Realist’s potential. Keep an eye out for this one. —Erfert Nielsen

FullWrite Professional

The word processing scene is heating up as Ann Arbor Softworks prepares to release FullWrite Professional. The program is going head-to-head with Microsoft Word 3.0 and WordPerfect’s Macintosh version, slated for release this fall. FullWrite’s prerelease version included many features unavailable in competing programs, including substantial layout and graphics capabilities. But what makes FullWrite look like a real contender is the way the features are implemented. Its power and sophistication don’t preclude ease of use.

Besides the usual features expected in a Macintosh word processor, FullWrite has autohyphenation, manual kerning, table-of-contents generation, indexing, footnoting, glossaries, and style sheets, as well as a spelling checker, thesaurus, a bibliography, and an outline. The program allows you to create multiple columns. You can also wrap text around

The Realist provides tools for retouching scanned images. It can soften an edge or create striking effects like this inverted image.
Like most professionals in today's multivendor environment, you have words stored on one system, spreadsheet and financial data on another and a need to combine information from both for presentation-quality documents on a third.

A software solution from OmniGate allows a Wang VS, Macs and IBM PCs to start talking to each other to meet your needs. Nearly 30 translators make sharing information across vendor lines easy and economical.

**Share And Share Alike**

Say you've got files stored on a Wang system and a desktop-publishing requirement using a Macintosh. Now you can connect them and transfer and translate documents and data files back and forth. Plug your Wang WP documents into MacWrite or Microsoft Word and merge them into PageMaker. Mail the PageMaker document to other Macintosh users via Wang OFFICE. Move data files or a Lotus 1-2-3 spreadsheet from a Wang VS to an Excel spreadsheet. Graph the figures using Excel and then insert them into the PageMaker layout.

Macintosh users can also access applications on the Wang VS. With our Macintosh 2110 terminal emulator, your Wang becomes an application and file server.

And OmniGate's solution set lets your Wang system do double duty if IBM PCs are part of your system. IBM PC users can transfer and translate information while in Wang 2110 terminal mode. Your Wang system becomes a versatile file and application server for both the Macintosh and the PC.

You need no special hardware to introduce your machines to each other, because our solution is a software solution. No document and file-format translator boxes. No special wires or cables. Implement our solution using dial-up, switched or dedicated telecommunication links. No special training is required to use an OmniGate solution, either.

**Let's Meet Today**

Call OmniGate at 415-781-6464 to meet the dealer nearest you. Once you've seen the OmniGate solution set, you'll know why we must go on meeting like this!
Macworld News

graphics of any shape and control the white space between the two. You can specify placement of pictures and sidebars—text or graphics that are treated as separate documents within the primary one—so that they stay with the main text. In addition, you can specify the placement of sidebars on even and odd pages as they flow onto different pages. You can also position a sidebar within surrounding material. *FullWrite* includes a MacDraw-like drawing module that provides for bezier curves and gray scaling, as well as screen-independent versions of bit maps for outputting to laser printers and typesetting machines.

One of *FullWrite*'s unique features is Posted Notes, an electronic equivalent of 3M's Post-it notes. The notes can be name-, date-, and time-stamped, allowing several people to attach comments to a document. The Browser offers a handy database function for checking various parts of a document, enabling you to browse through specific document elements. Click on an item in the Browser, and it takes you to the same spot in the actual document.

The locations of various notes are graphically marked in icon bars that run along the margin of a document. Displayed icons represent the notes attached to the document. The icons for a multicolumn document appear along the left margin of each column. To keep track of changes made since a previous edit, you can display bars along the margin that show the document's newly modified sections.

The program has many subtle touches. For example, the program automatically kerns italic text; and the cursor slants when you write in an italic font, making it easier to insert the cursor between characters. The program is smart enough to move footnotes from one page to the next if the references won't fit on the previous page. You can also index the first line of all paragraphs to create a kind of outline. A window tiling scheme gives you several alternatives for setting up windows on large screens. If this preliminary version is any indication, *FullWrite* is definitely worth a look when it's released.

The Mac Joins the OSI World

*Touch* Communications of Scotts Valley, California, has announced network software for the Mac designed to let it connect transparently to DEC and IBM machines using an industry-standard communications protocol. The software from *Touch*, which implements the Open Systems Interconnect (OSI) protocols developed by the International Standards Organization, is the first commercial software to comply with both the Technical Office Protocol (TOP) and the Manufacturing Automation Protocol (MAP), standards expected to untangle communications between machines from different vendors.

The *Touch OSI* software for the Mac will allow Mac users connected via AppleTalk to transparently access information stored both on IBM PCs running DOS and on DEC VAXs running the VMS operating system. Networked Macs connect to the PCs or VAXs via a Mac dubbed the Router, which is equipped with an external Ethernet bridge (an Ethernet card, in the case of the SE or Mac II) and the *Touch OSI* software. Macs that are not networked can connect directly to PC or VAX networks via Ethernet.

Using the *Touch network* software, Mac, PC, and VAX users can access information stored on other systems as if they were accessing the information locally. For example, Mac users could access PC and VAX files from a mounted volume on the desktop. PC files would appear as documents in folders, as would VAX files. PC and VAX users could access Mac files using the native DOS or VMS commands, specifying path names and subdirectories from a remote volume (E).

The *Touch OSI* software uses an interface similar to that of Centram Systems' *TOPS* software. However, *TOPS* requires non-Mac systems to understand the AppleTalk protocol, which has gained little acceptance outside the Mac world. Because *Touch*'s software uses an industry-standard protocol (the OSI protocol suite), it allows the Mac to communicate with any machine that understands the OSI protocols.

*Touch* Communications, in which Apple now holds a minority investment, plans to release the Mac software by the end of the year. Both DOS and VMS software are available now. *Touch* also plans to make the OSI protocols available for UNIX and IBM mainframes.

—David Ushijima

Network Fun and Games

Although it's often hard to sell multiuser software, due to the complexities of installation and troubleshooting, there's one application that draws even low-tech Mac users to a net-

(continues)

Randy Carr has a role for Spock in his new "Star Trek"-like game, *NetTrek*, which can be played by several persons on a network.
When they say a picture is worth a thousand words, they're describing LaserView,™ ultrahigh-resolution large-screen monitors from Sigma Designs.

Available for the Macintosh™ SE and Macintosh II in 15-inch and 19-inch sizes, LaserView provides a 1664 x 1200 on-screen pixel display (equal to 11 Macintosh SE screens). And because

LaserView is a noninterlaced monitor, text and graphics are displayed virtually flicker-free. Even facing pages.

You can select the default display mode of 1664 x 1200 pixels (2,000,000 pixels). Or choose the standard Macintosh resolution of 72 dots per-inch which yields an on-screen pixel resolution of 832 x 600 (500,000 pixels). You can choose from three cursor sizes and two system font sizes for legibility.

For more information on LaserView, call Sigma Designs today at (415) 770-0100. Or visit an authorized Sigma Designs dealer.

Because for computer-aided engineering, advanced desktop publishing and anything in between, LaserView offers you a totally new point of view.

Sigma Designs, Inc.
46501 Landing Parkway
Fremont, CA 94538
LaserView is a trademark of Sigma Designs, Inc. Macintosh is a trademark of Apple Computer, Inc. For commercial use only.

Circle 743 on reader service card
work games. For instance, MacroMind's Maze Wars search-and-destroy game was a hit on the Macworld network. And at a recent confab in Dayton, user group officials stayed into the wee hours playing a prerelease version of Randy Carr's NetTrek, a networked space-chase game that fans of TV's "Star Trek" are sure to find eerily familiar. (Carr, a software engineer for Apple, is still looking for a publisher for his game, which also has a single-user mode.)

Some publishers are wary of attempting to market entertainment software to the small group of people who have both networks and free time. Though MacroMind has sold more than 2000 copies of Maze Wars through little more than word of mouth, the firm has had a tough time convincing the distributor that the market is ready for such an innovative concept.

Kesmai Corporation has found a solution to the distribution problem: its multiplayer aerial combat game for the Mac, Air Warrior, is played online by subscribers to the GEnie information service. Subscribers download the game software, start it up on the Mac, and then enter the pregame orientation conference. There's no question that more dogfight competitors equals more excitement, since defying numerous human foes makes the game exponentially more unpredictable than does facing a single chip-bound opponent.

International Network Standards

When Bill Croft goes to his office at Stanford University each day, he may sit down to work at a Macintosh at his desk, a VAX across the street, a DEC System 20 across campus, a Cray across the country, or almost any kind of computer anywhere in the world. His Macintosh isn't any different from yours, but his work is part of what makes the Macintosh special for every user.

Bill developed SUMacC, the first cross-compiler for the Macintosh and the first alternative to Lisa Pascal. He needed more efficient communication between his Mac and the VAX for cross-compiling, so he next developed an AppleTalk/Ethernet gateway, which gave his Macintosh access to a lot more than the VAX across the street.

Through a gateway (now manufactured by Kinetics) and with Mac/IP software, an AppleTalk network can become part of the Stanford Ethernet, which connects hundreds of computers on campus. That network is in turn part of the ARPAnet that connects computers at many universities and research centers around the world. This has helped make the Mac an integral tool for international research.

Researchers can communicate easily, because all computer users (from Crays to Macs) share one characteristic: they all speak IP/TCP, the U.S. Department of Defense Internet Protocols. IP/TCP is a network specification that has become an internationally used standard, and now programmers at half a dozen universities have written applications for the Macintosh that use IP/TCP.

EFS (external file system) from Stanford, Columbia, and the consulting firm of Bolt, Berenek, and Newman, allows the VAX across the street to become a file server for Macintoshes all over campus. Telnet, a virtual-terminal program, and FTP, a file-transfer program, the mainstays of ARPAnet users, have a long heritage. With them, users have access to computers and files on the entire ARPAnet.

Apple has assigned a MAC/IP coordinator and has held a meeting of University Consortium members to facilitate further work in this area. —Clay Andres

Power to the People

Steve Brecher, a programmer since 1965, is the one other programmers call on for help in cleaning up their code. He is fondly known on some telecommunication services as MAUG's Grammarian, since no one needs a spelling checker when he's nearby. Not only has Brecher worked as a consultant on at least two projects for Apple, but he wrote the software for the MicahDrive as well.

In addition to contributing programs such as WayStation, Compact, and Multiple Regression to the public domain, Brecher—through his company,
AMARAY Media Mate 3
Holds 30 3½" $7.95
with lock $9.95

LANM CL ATE Diskette Files
Holds 45 3½" $16.95
Holds 90 3½" $26.95
Holds 135 3½" $36.95

Teakwood Diskette Files
Holds 45 3½" $16.95
Holds 90 3½" $26.95
Holds 135 3½" $36.95
Boxed in Tens - Minimum Order: 20

SONY or maxell.
3½" SS/DD
1.09 1.02
3½" DS/DD
1.59 1.52

Call for Larger Quantity Discounts
20+ 100+
SONY $9.95 $9.95
maxell $8.95 $8.95

DATATECH
3W
3W SS/DD
3W' DS/DD
20+ $9.99 $1.19
3W' $1.19 $1.15

DI SKKES
Boxed In Tens - Minimum Order: 20

Holds 45 3½" $16.95
Holds 90 3½" $26.95
Holds 135 3½" $36.95

SONY or maxell.
3½" SS/DD
1.09 1.02
3½" DS/DD
1.59 1.52

Call for Larger Quantity Discounts
20+ 100+
SONY $9.95 $9.95
maxell $8.95 $8.95

Beck-Tech Fasten Mac
Cooling Fan prolongs Mac life. Cools by 50° or more.
$74.00

Disk Book 10 . . . . $9.95
Holds 10 3½"
Disk Book 32 . . . . $19.95
Holds 32 3½"
Disk Book Plus . . . . $19.95
Holds 16 3½", Plus Manuals, Pens, etc.

EHM AN ENGINEERING, INC.
BOOK Drive
• Totally Silent
• LED (so you know the silent drive is running)
• Compact, style matches Mac
• 12 month warranty
$199.00

Circle 373 on reader service card
Suitcase, convoluted means of accessing access or forced to use unlimited quantities of DAs, fully to the Mac interface. In situations as well, many of us would more. Brecher's other release, were either limited to 15 desk applications much more quickly than does the Finder. You can easily configure PowerStation to open 472 specified applications, desk accessories, or documents; you can set one default document for each application. There are 16 pages of buttons that can be named and launched with a single mouse click. You’re given a multitude of options, including a Go To function, upon quitting any application. Every aspect of the program adheres beautifully to the Mac interface. In fact, PowerStation is so versatile and easy to use, if it provided copy and delete features as well, many of us would never view our desktops again. Until now, Macintosh users were either limited to 15 desk accessories or forced to use convoluted means of accessing more. Brecher's other release, Suitcase, lets you easily access unlimited quantities of DAs, fonts, and F-keys without installing them on the System. When you start up, Suitcase automatically puts many of them in their respective menus; it then allows you to call up additional ones from within applications. It even simplifies desk accessory selection by using a menu that responds to keyboard commands. Suitcase takes up less than 15K, is compatible with Switcher, and will work with a 512K Mac.

Evaluation copies of Brecher’s programs are available through user groups and telecommunication services. When you purchase either of them ($59.95 each), Brecher’s Pyro—the prettiest and most configurable screen-saver around—is provided free of charge.—Linda Joan Kaplan

The European Difference

At the first European Macworld Expo, held in Rotterdam this April, a number of European companies exhibited products: Inventab of Sweden, a shareable RS-232C serial port for use with AppleTalk; MicroPlanning International of the United Kingdom, a very successful Microplanner project system; Pixel Software, also of the United Kingdom, a high-resolution color slide production system; CDS Electronics of the Netherlands, several front-end industrial device controllers and analog/digital converter add-on boards for the Mac SE and Mac II as well as for the TimeWand system from Videk. Abvent of France showed Space Edit, a 3-D CAD system, Build 1-2-3, a housing-oriented CAD system; Simul, a dynamic modeling program; and WorkStation, a 68020 accelerator add-on card for the Mac Plus.

Perhaps more important than the products themselves was the vitality shown by the European Macintosh community—despite overwhelming odds. Due to the combined effects of customs duties, taxes, and generally lower personal income, the Macintosh is found primarily in business and professional environments in Europe. Business, cultural, and language differences have created another major barrier: market fragmentation. Still another factor limiting the Mac's acceptance there is Europe's rigid devotion to MS-DOS and IBM compatibility, which far exceeds anything we've encountered in North America. Perhaps this reflects the desire for a strong international standard in an otherwise highly fragmented multinational marketplace. Add to those factors the typical price of an MS-DOS clone—much lower than that of the Mac—and clearly the Mac faces a struggle for supremacy in the European market.

Also influencing the European Macintosh user community are solution centers, vertical-market-oriented dealerships that are even more popular in Europe than they are in North America. Apple itself has participated in the development of a number of Apple centers, specialized dealers capable of providing high-level technical and market-specific support. Numerous third-party system/solution houses have also surfaced; they complete Macintosh hardware and software systems in engineering, graphic and musical arts, publishing, and accounting.

Although user group development has been slower in Europe than in North America, several user groups were represented at the conference, including Mac e.V., the Macintosh User Group UK, and MacClub Benelux. Unlike many smaller groups that are primarily group purchase discounters, they provide information, education, technical support, and a communication channel for their members. Mac e.V., the German user group, has over 900 members (continues)
It's one thing to have great graphics. It's something else to make them move.

**VideoWorks™ II for:**
- Business Presentations
- Animated Slide Shows
- Multi-media Storyboards
- Educational Movies
- Entertaining Animations
- Suggested Retail Price $195

MacroMind has been making the Macintosh look great for years. Now let us make you look great with VideoWorks™ II! The Overview window creates slide shows that can include animation, wipes, fades, timers or sound. VideoWorks™ II works great with the Macintosh II (in either 16 or 256 colors) or the Macintosh 512, Plus, SE.

Create animation on your Macintosh with VideoWorks™ II. Take any artwork you have and create animated presentations, storyboards, educational courseware, point of sale displays or music-videos. From MacroMind® Inc., the creators of MusicWorks™, M.U.D.™, Art Grabber™, ComicWorks™, GraphicWorks™, Maze Wars+™.

Original VideoWorks owners can upgrade to VideoWorks II for $100. Send your check, VISA or MC order along with your VideoWorks Movies disk.
Standardized Desktop Publishing

The National Bureau of Standards (NBS) is establishing the Electronic Publishing Laboratory to create page-description vernacular standards and to demonstrate the various PostScript output technologies available for desktop publishing. The laboratory will be housed in the NBS headquarters at the U.S. Department of Commerce in Gaithersburg, Maryland.

Standards developed at the laboratory are expected to have wide impact on the desktop publishing equipment industry, since they'll determine what federal government procurements will specify. NBS analysis of equipment performance is also expected to establish future benchmarks for “test-page” production time and costs.

The lab will be open for equipment demonstration and comparison by both federal agencies and corporate users; specifications will include rated duty cycle, type of engine, rate of speed, and type of papers used. The lab is also expected to spin off workshops and conferences designed to generate ideas for future directions and applications.

—Stuart Silverstone

Sons of Apple

Not your typical Mac developer is Radius, maker of the Radius Full Page Display (FPD) and 68020 accelerator boards for the Plus and the SE. It derives its unusual character from its principals—all alumni of the original Macintosh development team. Radius president Mike Boich was the first Apple Evangelist and is coauthor of MacTerminal; Burrell Smith, the company’s hardware wizard, designed the Macintosh LaserWriter digital boards; marketing and sales leader Alain Rossman was head of the Apple Evangelists; Matt Carter, head of operations, was the guiding force behind the creation of the Macintosh factory; and Andy Hertzfeld, the software guru of Radius, was the key developer of the Mac’s System software.

Burrell Smith, believing that the Mac was capable of doing a lot of things that people didn’t think it could, developed an expansion port and a large-screen design in his home workshop after the release of the Mac. In February 1986 Smith talked to Matt Carter about starting a company. Carter helped him draw up a business plan and get parts for building a prototype FPD. After learning of the plan, Mike Boich used the money from his recently sold house to get Radius off the ground. In April, Rossman joined in May and Andy Hertzfeld was called in as a consultant to handle the software development. By September the FPD was shipping and Radius was off its way. Early in 1987, Radius signed a deal with Kleiner Perkins for an influx of venture capital to help the company grow and allow for more R and D.

With money in the bank and a few products under its belt, Radius has become a thriving company with more than 25 employees and new quarters in Sunnyvale. Its goal is still to develop products for the Mac that smoothly integrate hardware and software, and leverage the engineering talents of Smith and Hertzfeld. Eventually Apple will get around to producing 68020 boards for the SE, while Radius and others will have taken the next leap forward before Apple catches up.

Employees at the National Bureau of Standards are setting up a new laboratory that could have major impacts on the future of desktop publishing for both government and manufacturers.
SOFTWARE

NCP denotes not copy-protected. CP denotes copy-protected.

Aegis Development ... NCP 42.
Affinity Microsystems ... NCP 55.
ALSoft ... NCP 27.
Altaya ... NCP 27.
FONtastic Plus (advanced font editor) 49.
Fontographer (Laserwriter font editor) 245.
Ann Arbor ... NCP 49.
Bogas Productions ... NCP 59.
Broderbund ... CP 85.
Borland International ... NCP 64.
IntlView (statistic package) 35.
Grafiksd (DA graphics organizer) 63.
NetView (network software) 65.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
CAMDE ... NCP 49.
Nutricalc (diet & nutrition analysis) 49.
CasadyWare ... NCP 175.
Turbopascal (HFS compatible) 59.
Modular Design (multi-user available) 19.
Bogas Productions ... NCP 21.
Studio Session (music creation) 59.
Challenger Software ... CP 21.
General Accounting (full-featured) 129.
BrainPower ... NCP 35.
Strap (spreadsheet, requires 512k) 35.
Designscope (electronic circuit design) 129.
SiteView (network software) 179.
Challenger Software ... CP 21.
Courier Technologies ... NCP 26.
MacCalc (easy to use spreadsheet) 49.
Broderbund ... CP 29.
Print Shop (create cards and memos) 39.
Geometry (over 350 problems!) 64.
Out on a limb.

We don't want to offend anyone, but people who still use hard copy are seriously out of date. Just take a look at the artistic strokes of genius on our temporarily tattooed friend. Why, for the right price, you could present your next newsletter, spreadsheet, or epic poem in real living color.

Picture your logo rippling across someone's exotic exterior. Amaze your boss as the gentle undulations of breath do things to your five-year plan that you never imagined possible. Why, even editing could be fun again!

Fleshtop publishing.

David Chalk and his partner Roy Zuckerman at Temptu Marketing in New York are designing tattoos on their Mac which are turning traditional marketing literally inside out.

It all started when Roy saw what his father, one of the world's leading cosmetics chemists, had developed for the movie "Tattoo"—a safer and longer-lasting body paint than anything previously available. He and David were soon selling the paint in kits along with design transfers which can be applied in seconds with good old rubbing alcohol.

They've done custom work for everyone from Miami Vice to Guinness Stout. And, for quick designs, the Mac is starting to come in handy (and footy, and everywhere in between). Temptu can now digitize very custom images for transfer to very custom parts.

According to our winners, temporary tattooing is "the contact sport of the 80's." So it's only natural that they've chosen the micro of the 80's to help with their design and marketing.

Oh, Lydia, could you have had fun with this one. Eh, Groucho?

---

Contest Winner

Name: David Chalk, Temptu Marketing
System: Mac Plus
Applications: Designs custom temporary tattoos; tracks clients and orders; produces mailing pieces and catalogs.

MacConnection

14 MILL STREET, MARLOW, NH 03456  1-800/Mac&Lisa or 603/446-7711
©Copyright 1987 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc., Marlow, NH.
with your Mac.

Primera Software ... CP
Smash Hit Racquetball (top-rated) .... $15.
Palon ... CP
Palion Chess (3D and multi-lingual) ... $31.
Rainbird ... CP
Paw (fantasy adventure) ............. $27.
Sierra On-Line ... CP
King's Quest ..................... $30.
King's Quest II .................. $30.
Space Quest ..................... $30.
Silicon Beach Software
Airborne (CP, the classic) ............ $20.
Enchanted Scepters (CP, over 200 scenes) $21.
Dark Castle (NCP, arcade action) .... $28.
World Builder (NCP, program creator) $41.
Simon & Schuster ... CP
Star Trek—The Kobayashi Adventure $24.
Siri-Tech ... CP
Mac Wizardry (high-rated fantasy) .... $35.
SPHERE, INC. ... NCP
GATO (submarine simulation) ......... $26.
Orbiter (space shuttle simulation) .... $27.
Tekshare II (N& N, & So, & hemispheres, req. 512k) $32.
XOR ... NCP
NFL Challenge (teach the coach) ...... $79.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

NOTE: Some hardware items are available in either platinum or beige color. Please specify.

20 Megabyte SCSI Hard Drive ..... 589.
ApriCord ... 1 year
ApriCord Mac (for Mac 512k or Mac Plus) $75.
AST Research ... 2 years
AST TurboScan (300 cpi scanner) .... $1479.
AST 2000 (20, 20 MB tape) ........ $1479.
AST 4000 (74 MB, 60 MB tape) .... $3895.
Curtis Manufacturing
Diamond (6 outlets) ................. $29.
Emerald (6 outlets; 6 ft cord) ......... $36.
Sapphire (3 outlets; EMI/RFI filtered) $47.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) $55.
Dove Computer ... 90 days
Mac Snap Memory Upgrades ........ call
Ergotron ... 1 year
Mouse Cleaner 360° .................. $15.
MacTilt or MacTilt SE ............... $74.
MacBuiter 512K .................... $329.
MacBuiter 1024K .................. $429.
Farallon Computing ... 1 year
PhoneNET PLUS (DB-9 or DIN-8) .... $39.
Hayes ... 2 years
Smartcom II (communications software) $88.
Smartmodem 1200 .................. $299.
Smartmodem 2400 .................. $449.
InterBridge (connect AppleTalk networks) $599.
IONEMA ... 1 year
Bernoulli Box (dual 10 MB w/DD) ... $1579.
Bernoulli Box (dual 20 MB w/DD) ... $1879.
Kensington ... 1 year
AppleTalk Cable Clips or Connectors each 1 ... Mousescopy (mouse tracking pad) .... $8.
Mouse Sack (for your mouse) ........ $8.
Mac Plus/Mac SE System Saver Cover .... $8.

MacConnection Hardware Special
through September 30, 1987

KOALA
MacVision
The MacVision digitizer converts any video signal into a high quality image directly within your graphics software. Simply attach the unit between a video camera and your Mac to digitize two-dimensional objects, or to capture images from your VCR. Completes a full screen scan in less than 30 seconds.
- Operates as a desk accessory
- Uses any RS170 standard video source
- Features MoreVision™ special effects software
- Special camera offer inside
MacVision (for your Mac) .............. $169.

Imagewriter II Dust Cover ........... $9.
Mouse Cleaning Kit w/Mouse Pocket .... $17.
Disk Case (holds 36 Mac disks) ...... $19.
Disk Drive Cleaning Kit .............. $20.
Tilt/Swivel ................................ $22.
Universal Case (90 MB tape) ....... $24.
Polarizing Filter (Mac Plus or Mac SE) $34.
Surge Suppressor ..................... $34.
Printer Muffler (90 column) ......... $39.
Printer Muffler (132 column) ....... $42.
Control Center ....................... $64.
System Saver Mac .................. $64.
A/B Box (for the Mac Plus) ........ $64.
Turbo Mouse ....................... $85.

KOALA Technologies ... 90 days
Kraft ... 1 year
3 Button QuickStick .................. $39.
Migent ... 1 year
Pocket Modem (300/1200 baud) ...... $169.
Mirror Technologies ... 1 year
Magnum 800 External Drive ........ $209.
Magnum Tape 20 Backup ............. $899.
Magnum Tape 40 Backup ............. $1199.
MagNet 40/40 (40MB tape) .......... $2395.
MagNet 20x (w/10 MB tape) ....... $779.
MagNet 30x (w/20 MB tape) ....... $943.
MagNet 40x (w/40 MB tape) ........ $1299.
MagNet 85x (w/40 MB tape) ....... $1995.

Nutmeg Systems ... 1 year
Nutmeg 19" Monitor ................. $1579.

NuvoTech ... 1 year
EasyNet (AppleTalk network connection) $29.

Personal Computer Peripherals ... 1 year
MacBottom Hard Drive 21MB (SCSI) .. $859.
MacBottom Hard Drive 45MB (SCSI) .. $1285.
SoftStyle ... 90 days
MacEnhancer (for plotters to printers) $179.

Summagraphics ... 90 days
MacTablet 12" x 12" ................ $379.

Dow Jones
MacCard (surge protection) .......... $55.
Thunderware ... 90 days
ThunderScanner 4.0 with PowerPort $199.
Western Automation ... 1 year
DASCH RAM disk 2000K ......... $429.

DISKS
Sony 31/4" DS/DD Disks (box of 10) ... $21.
MAXELL 31/4" DS/DD Disks (box of 10) $24.
Fuji 31/4" DS/DD Disks (box of 10) ... $21.
Verbatim 31/4" DS/DD Disks (box of 10) $23.
3M 31/4" DS/DD Disks (box of 10) ... $23.

INFORMATION SERVICES
Compuserve
Compuserve Information Service .... $24.

 Dow Jones
Dow Jones News/Retrieval Membership Kit $24.

ACCESSORIES

Computer Coverup
Imagewriter II Cover .................. $8.
Mac Plus & Keyboard (two covers) .... $10.
I/O Design
Imagewriter II (Imagewriter II carry case) $49.
MacCard Plus (Mac Plus carry case) .... $49.
MacCard SE (Mac SE carry case) ........ $49.
Kalmar Designs
Teakwood Roll·top Case .............. $27.
Moustrak Pad (for the mouse ride) .... $14.
Moustrak Pad (for the mouse ride) .... $14.
Moustrak Pad (for the mouse ride) .... $14.

Sensible Softworks
High Quality “MacArtire” dust covers .... $17.

Smith & Bellow
Mahogany Desk Case (holds 90 disks) .... $28.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- We will ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders usually shipped 1st Class Mail.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products.
- To order, call us any time Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/646-7711 Monday through Friday 9:00 to 5:30.

SHIPPING

Note: Accounts on net terms pay actual shipping.

Excludes: GST (General Sales Tax) on orders outside of New Hampshire.

For all other items, add $2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. Hawaii: For printers and drives, actual UPS Blue charge will be added. For all other items, add $2 per order. Alaska and Outside Continental US: Call 603/646-7711 for information.

For orders $25 or over, we will automatically use UPS Ground. Additional shipping charge may apply.

For UPS shipments $50 or over within Continental US: Call us at 603/646-7711 for information.
Performance:

Odesta ... NCP
Double Helix (relational, custom menus) $275.
Multi-User Helix (requires 512k) 439.

OWL International ... NCP
Guide (hypertext, free-form info) 79.

Palantir ... CP
Math/Flash, Wordplay or MacType 26.
inTalk (communication to emulation, NCP) 99.

Passport Designs ... CP
Passport MIDI Interface 95.
Master Tracks Pro 259.

PBI Software ... NCP
HFS Locator (DA organizer for HFS) 26.
HD Backup (supports MFS, HFS) 29.

Person of the Art ... NCP
PaintPlus 32.

ProVUE Development ... NCP
OverVUE 2.0 (power-packed database) 149.
Mail Manager or Pers. Finance Template 29.

Rubicon Publishing ... CP
Dinner At Eight-Silver Palate Bundle 52.

Satori ... NCP
BulkMaker (mailing lists) 74.
BulkMaker Plus (up to 90,000 names) 225.
Legal Billing (attorneys to accountants) 385.
Legal Billing II (full trust accounting) 575.
Project Billing (architects to engineers) 445.

Silicon Beach Software ... NCP
Silicon Press (printer utility, 512k) 41.
SuperPaint (advanced graphics program) 54.

Simon & Schuster ... NCP
Mac Art Department (req. Paint program) 24.
Typing Tutor III (learn to type) 35.

SoftStyle ... NCP
Epetest (Epson laser printer driver) 27.
Colorprint (color printing utility) 48.
Printworks (print faster & in color) 49.
LaserWright (Lasertech Laserjet) 58.

Softview ... NCP
Macinuse (time-usage manager) 29.

Software Ventures ... NCP
Microphone 1.1 (includes Glue™) 129.

Solutions, Inc. ... NCP
SmartScript & The Clipper 41.
Glue (creates "print to disk" capability) 41.

Springboard ... CP
Art la Mac Vol. 1-People & Places (NCP) 23.
Art la Mac Vol. 2-Variety Pack (NCP) 23.
Certificate Maker (CP) 35.

State of the Art ... CP
Electric Checkbook (print checks) 28.

SuperMac Technology ... NCP
SuperSpool 4.0 49.
Diskit (backup & restore utility) 49.

SuperLaserSpool ...
Multi-User SuperLaserSpool 259.
Survivor Software ... NCP
MacMoney (financial planner) 42.
Symmetry ... NCP
Acta 1.2 (outlining/writing desk accessory) 1.38.
PictureBase 1.2 (clip art manager, 512k) 44.

TextSoft ... NCP
Business FileVision (512k, external drive) 199.

Think Educational ... CP
MacEdge II or Mind Over Mac 28.

THINK Technologies ... NCP
Laserspeed (Laserwriter utility) 65.
Lightspeed Pascal (includes debugger) 85.
Lightspeed C (C compiler) 125.

TML Systems ... NCP
TML Source Code Library 58.
TML Database Toolkit 64.
TML Pascal Compiler (req. 512k) 68.

TrueBasic ... NCP
True BASIC (last, flexible, & portable) 59.

Algebra Calculator, Trigonometry, 3D Graphics, Discrete Math, Probability, Chippendale utilities & Calculus ... each 35.

TrueSTAT (statistics) 58.
Runtime (create stand-alone applications) 59.

Unicorn ... CP
Animal Kingdom (ages 6-12) 27.

Deca/Deca (math, ages 9 and up) 27.
Fraction Action (arcade style math game) 27.
Mac Robots (pre-school program) 27.

Math Wizard (math games, ages 5-10) 27.

Read-A-Rama (reading, ages 5-8) 32.

William & Macias ... NCP
myDiskLabeler (design & print labels) 24.
myDiskLabeler w/Color (req. ImageMaster) 23.

myDiskLabeler with Laserwriter option 30.

216 Laser Labels 19.

Working Software ... NCP
Spellwell (spelling checker) 45.
Spellwell Medical Dictionary 59.

GAMES:

Accolade ... CP
Hardball (baseball simulation) 24.

Activation ... CP

Championship Star League Baseball 22.
Shanghai (Mah Jongg strategy) 24.

Addison-Wesley ... CP
Puppy Love (your dog will love it!) 14.

Artworx ... CP
Bridge 5.0 (sharpen your skills) 20.

Avalon Hill ... CP
Mac Pro Football (req. 512k) 30.
Mac Pro Football 85 Team or Season 16.

Blue Chip ... CP
Millionaire, Tycoon, Baron or Squire 35.

Broderbund Software ... CP
Lode Runner (over 150 levels) 24.

Ancient Art of War (military strategy) 27.

Toy Shop (create working models) 39.

Ferrari Grand Prix (Formula One racing) 34.

Fokker TriPlane Flight Simulator 34.

Electronic Arts ... CP
Archer (arcade strategy, req. 512k) 27.

Skyfox (3D graphics) 27.

Seven Cities of Gold 27.

One on One/Dr J vs Larry Bird (req. 512k) 27.

Patton vs Rommel (req. 512k) 27.

Pinball Construction Set 27.

Chessmaster 2000 30.

Epyx ... CP
Rogue (strategy dungeon classic) 15.

Sub Battle Simulator 24.

Witchfinder (Murder mystery) 24.

Hayden Software ... CP
Perplex (scarble-game type) 24.

Sargon III (9 levels of chess) 29.

Infinity Software ... CP
Grand Slam (tennis, req. 512k) 27.

Incom ... CP

Leather Goddesses, Trinity, Moonmist, Ballyhoo, Bureaucracy (standard) 24.

Zork Trilogy 45.

Invisiclip Hint Booklets (please specify) 6.

MacroMind ... NCP
Maze Wars (play via modem or network) 32.

Miles Computing ... CP
Harrier Strike Mission (3D flight simulation) 27.

Quintette (strategy of "Go") 27.

Down Hill Racer 27.

Mindscape ... CP
Balance of Power (world politics) 30.

King of Chicago (req. minimum 512k) 30.

Braemats (great graphics, req. 512k) 30.

Uncharted (mystery adventure) 30.

Shadowgate (fantasy graphic adventure) 30.

Deja Vu (murder mystery) 30.

PBI Software ... CP
Strategic Conquest (multi-user) 35.

1-800/Mac & Lisa 740C

MacConnection, 14 Mill Street, Marlboro, NJ 07752 800/622-5472 603/466-7711

Copyright 1987 PC Connection, Inc. MacConnection is a division of PC Connection, Inc. MacConnection is a trademark of PC Connection, Inc.

All items subject to availability. Price subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.
Laser printers offer lower prices by abandoning PostScript—but does compatibility suffer?

Are you looking for an inexpensive laser printer? A new category of laser printers is appearing that promises faster printing at much lower prices. General Computer has announced one that prints at the same speed or faster, and with the same quality, as an Apple LaserWriter—for less than $2500.

What's the difference? Printers like General Computer's Personal LaserPrinter don't use PostScript, Adobe's page-description language. The Personal LaserPrinter relies on the Mac's central processing unit (CPU) and memory to describe the page using the QuickDraw commands contained in the Mac's ROM, whereas the LaserWriter has two megabytes of memory and a 68000 microprocessor to translate PostScript commands into a printed image.

According to proponents of the new printing scheme, the Mac Plus has enough power to process 300-dots-per-inch (dpi) pages as fast as a LaserWriter Plus. A Mac II or an accelerated Mac Plus or Mac SE can process page images even faster. Furthermore, the QuickDraw graphics package that applications use to draw screen images is, with a few extensions, every bit as capable of describing most 300-dpi pages as PostScript.

But the QuickDraw scheme employed by General Computer has its disadvantages, too. Because the Personal LaserPrinter is just that—personal—it can't be easily attached to an AppleTalk network for others to share.

While General Computer's is the first laser printer that relies entirely on the Macintosh to process 300-dpi page images, at press time Apple was expected to announce a similar product also based on the QuickDraw imaging model.

From Screen to Page
A major precept of Macintosh philosophy requires printed images to match screen images as closely as possible. This precept is called What You See Is What You Get, or WYSIWYG (pronounced wizzy-wig). Almost all Macintosh application programs use the Mac's built-in graphics package, QuickDraw, to draw images on the screen. They also use QuickDraw to describe the image of a page for printing on an ImageWriter and to create a bit-mapped image (a dot pattern) of the page for that printer and the screen. Only a few games and special-purpose graphics applications bypass QuickDraw.

Most applications initially use QuickDraw to describe page images for a LaserWriter, too. The LaserWriter driver (the controlling software that runs on the Mac) translates the QuickDraw description to the LaserWriter's graphics language, PostScript. A few applications like Cricket Draw augment the LaserWriter driver's PostScript page description with their own PostScript commands for special effects. The processor inside the LaserWriter interprets the PostScript page description to create a 300-dpi bit-mapped image for the page.

In lieu of PostScript, General Computer's printer driver intercepts QuickDraw page descriptions and substitutes high-
quality fonts and special effects where appropriate. Together the Personal Laser-Printer driver and QuickDraw prepare a 300-dpi bit-mapped image for the page.

Neither PostScript nor QuickDraw is decidedly better for page description. Both have advantages and disadvantages. On the one hand, PostScript has superior font handling. It can directly create halftones from digitized photographs—limited by the printing device, of course. (A 300-dpi printer is capable of rendering an almost newspaper-quality photograph.) Also, PostScript is not tied to one machine. This means all PostScript printers are interchangeable, from the 300-dpi LaserWriter to the 2540-dpi Linotronic 300.

On the other hand, QuickDraw is faster than PostScript for most operations. For example, it is much faster at clipping objects to a nonrectangular boundary. (Clipping is the electronic version of a coloring book that won’t let you draw outside the lines.) Most important, QuickDraw is free and it doesn’t require costly additional computing power within the printer.

Most of the functions PostScript performs better or differently have now been defined as standard extensions to QuickDraw. They’re known as picture comments, or picComments. The Personal LaserPrinter driver intercepts the most common picComments to create special effects such as rotated text. It also optimizes fonts like PostScript does.

Letter for Letter
The Personal LaserPrinter uses geometrically defined outline fonts that are very similar in appearance and concept to the LaserWriter's high-quality PostScript fonts. A single such font can be mathematically scaled up or down with no loss of quality, like circles and polygons in MacDraw. In contrast, screen fonts are defined by dot patterns, like circles and polygons in MacPaint. Each screen font size requires a separate bit-mapped definition. Figure 1 compares outline-font and screen-font definition.
Rotation at any angle, text along a curved path, and other special effects are easy to achieve with outline fonts. PostScript supports such effects now, although only a few Macintosh applications (like Cricket Draw) let you take advantage of them. At press time, General Computer hadn’t decided which (if any) special effects it would support in the first release of the Personal LaserPrinter driver.

The Personal LaserPrinter has the same outline fonts as a standard LaserWriter and two of the additional fonts found on a LaserWriter Plus. However, instead of using the Adobe fonts the LaserWriters use, General Computer licenses its outline fonts from Bitstream, which distributes fonts for the IBM PC market. The Personal LaserPrinter comes with 6 font families: Times, Helvetica, Courier, Symbol, Zapf Calligraphic (like Palatino), and Swiss Narrow (like Helvetica Narrow). The font families contain separate definitions for various styles such as plain, bold, italic, and bold italic. Equivalent screen fonts are also included in several sizes. General Computer plans to offer another 20 or so outline-font families (about $180 per family) when the printer is shipped.

Caching the Wave
The LaserWriter stores outline-font definitions in its memory—some in ROM and some in RAM. Personal LaserPrinter outline-font definitions are stored on disk. You control the availability of fonts by dragging icons in and out of the System Folder. You can keep as many fonts on hand as you like, without having to use space for fonts you aren’t using. The Personal LaserPrinter driver retrieves outline-font definitions from disk as needed and puts them in a reserved area of the Mac’s memory called a font cache.

Although outline fonts are mathematically defined, when they’re printed bit-mapped images must be built in the proper size and style for each character. The LaserWriter ROM contains prebuilt images for Times 12, Helvetica 12, and Courier 10. When the printer’s not printing, it builds bit-mapped images for Times 10 and 14; Helvetica 10 and 14; Times bold 10, 12, and 14; and Helvetica bold 10, 12, and 14. It builds all other characters as needed. If it has room in its memory, it keeps images for characters it has built in its font cache.

Other PostScript devices, such as the Linotronic 300 typesetter, use a disk drive for font caching. The disk font cache is more permanent than the LaserWriter’s RAM font cache. A disk font cache isn’t necessarily erased after a document is printed, and it lives on even when the Linotronic is switched off.

Because General Computer’s printer has no prebuilt characters in memory, the Personal LaserPrinter driver must build bit-mapped character images on the Mac as needed during page processing. Once built, they’re kept in a font cache area of the Macintosh memory. If the font cache fills up, the driver removes the least used outline-font definitions and bit-mapped images to free up space. In the future, Personal LaserPrinter drivers will establish a font cache on disk, similar to the one just described for a Linotronic 300. The disk font cache will keep bit-mapped images for the characters used most often. If a needed character exists in the disk font cache, it can be retrieved directly from disk.

Blacker Blacks
The Personal LaserPrinter is physically capable of printing any image the LaserWriter or another similar laser printer can handle. Its best resolution is 300 dots per inch. The Personal LaserPrinter can also simulate 75 dots per inch, which is essentially the same as the Macintosh screen resolution. At that resolution it prints almost instantaneously.

The LaserWriter and all other laser printers that use the Canon printing engine are often criticized for poor-quality blacks that look dark gray. That’s because the Canon engine uses a write-black technology, which means its laser beam exposes the photosensitive drum where the toner will adhere (see “Laser Wars,” Macworld, June 1987). The Ricoh printing engine in the Personal LaserPrinter uses a write-white technology that yields much darker blacks. Its laser beam exposes the areas of the drum that correspond to the white areas of the page.

Scaling for Accuracy
MacPaint documents and other bit-mapped images have always presented a problem for the LaserWriter; a problem the Personal LaserPrinter shares. Bit-mapped images are defined at 72 dpi for on-screen display and must be scaled for printing on a 300-dpi printer. For example, a 1-inch line is 300 dots long on either printer and 72 dots long on the screen. A single dot on the screen corresponds to $4\pi$ (or about 4.17) dots on the printer. Of course neither the LaserWriter nor the Personal LaserPrinter can print a fraction of a dot. To accurately scale a 72-dpi bit-mapped image, they must add one extra dot to every 24 dots at 300 dpi. This results in splotchy scaling of some images.

To avoid splotchiness, LaserWriter drivers before version 4.0 used a scaling factor of 4:1 for bit-mapped images. At that scaling factor, however, bit-mapped images are printed at about 96 percent of their displayed size (96 percent of 4.17 is 4). Outline-font text and geometrically defined objects can be scaled smoothly at any ratio, so LaserWriter drivers before version 4.0 used a scaling factor of 4.17:1. As a side effect, outline text and geometric objects printed slightly larger than bit-mapped images. Version 4.0 of the LaserWriter driver offers two cures for the discrepancy: it scales everything on the page either at 4:1, for a slightly smaller page image with smooth bit-mapped images, or at 4.17:1, for a correctly sized page image and rougher bit-mapped images.

General Computer’s prototype printer driver used the same scaling factors as LaserWriter drivers before version 4.0. It printed outline fonts and geometric objects full size and bit-mapped images at 96 percent. It scaled screen fonts at 4:1 (96 percent) and added extra space as needed between words to maintain the displayed line length. At press time, General Computer had not decided whether to adopt the LaserWriter 4.0 conventions.

Figure 1
Bit-mapped fonts (left) are defined by dot patterns. Outline fonts (right) are defined geometrically with lines and curves. Outline fonts can be smoothly scaled and rotated.
You use the Chooser to choose a printer.

You choose Page Setup from the File menu and set page characteristics.

You choose Print from the File menu and select print job options.

Application uses Mac's built-in Print Manager software to generate QuickDraw description of each page in print job. (Some applications do one page per job.)

Final Quality

PLP driver divides page into bands. Then, one band at a time:

PLP driver has QuickDraw prepare 300-dpi bit-mapped image of one band in Macintosh memory.

Repeat for all bands.

PLP driver compresses single-band bit-mapped image and saves it on disk.

PLP driver reads all single-band images from disk and assembles compressed bit-mapped image for entire page in Macintosh memory.

PLP driver uncompressed bit-mapped image for entire page and simultaneously blasts it over SCSI bus, timed to match printer drum rotation.

Inside printer, laser traces page bit map onto toner cartridge's rotating photosensitive drum.

Draft Quality

PLP driver has QuickDraw prepare 75-dpi bit-mapped image of page in Macintosh memory.

As needed, PLP driver copies outline fonts from disk to Mac.

If necessary, LaserWriter driver initializes LaserWriter by sending Laser Prep file, which adds commands and functions to the PostScript interpreter.

LaserWriter driver translates QuickDraw page description to PostScript.

As needed, LaserWriter driver copies screen fonts and downloadable PostScript outline fonts from disk to Mac and then sends them to LaserWriter.


LaserWriter controller prepares 300-dpi bit-mapped image of page from PostScript translation.
The Price of QuickDraw Printing

Processing a 300-dpi page image takes lots of memory. You might think it imprudent of General Computer to ask a Mac Plus to try. The Personal LaserPrinter has one megabyte (1024K) of memory, half that of a standard LaserWriter. The Mac surrenders at least 128K to an application and donates another sizable chunk to system overhead. What's left is hardly the 960K required for a complete bit-mapped page image at 300 dpi. Furthermore, the Personal LaserPrinter driver and the font cache demand additional memory.

General Computer's programmers exercised their ingenuity and devised a method for reducing the amount of memory needed at any one time. The Personal LaserPrinter driver doesn't attempt to prepare a bit-mapped image for a whole page at once. It divides the page into bands, the way the ImageWriter driver does when it prepares a high-quality page image. The driver adjusts the number of bands according to the amount of memory available.

For each band, General Computer's printer driver has QuickDraw prepare a complete bit-mapped image. Then it compresses the bit-mapped image and saves the compressed image on disk.

After the driver compresses and saves the bit-mapped images for all bands one by one, the portion of the driver that did the work is tossed out, freeing some memory. Then all the bands are read into memory together. The resulting compressed bit-mapped image of the entire page typically occupies 200K to 300K of memory, though it may be as small as 50K or as large as 850K.

The maximum amount of memory is required when the compressed bit-mapped image of an entire page is in memory at once. So much memory is needed that it's probably not possible to print directly from an application when running under Switcher, using a RAM cache, or sharing the Mac's memory in any other way. To print on a Personal LaserPrinter, you must have at least 512K of memory available, and General Computer strongly recommends 1MB.

Like the LaserWriter, the Personal LaserPrinter can smooth bit-mapped images and screen-font text to eliminate some jaggedness attributable to their 72-dpi origins. The Personal LaserPrinter lets you choose to smooth either bit-mapped images, screen-font text, or both. The LaserWriter gives you a choice between smoothing both or not smoothing.

No Speed Loss

Because General Computer's evaluation unit was an early prototype, a stopwatch comparison to another printer would have little meaning. However, the Personal LaserPrinter seemed to exhibit about the same speed overall as other 300-dpi laser printers currently available for the Mac. Its main drawback is the Mac's unavailability for other tasks while a document is printing, since the printer uses the Mac's CPU and memory.

Speeding up a Personal LaserPrinter is easy. All you do is add more memory to your Mac. The more memory is available, the faster the printing process. Adding an accelerator card to a Mac Plus or a Mac SE also speeds up printing. In both cases, you're enhancing the Mac, not the printer, so the enhancements will improve the Mac's performance in nonprinting tasks as well.

Installing the Personal LaserPrinter memory cartridge should not directly increase the printer's speed, since most of the printing time is taken up in image processing on the Mac. The memory cartridge helps Macs with limited free memory, such as a 512K Mac or a larger machine with a RAM cache, Switcher, and so on.

The Work Group Undone

Because the Personal LaserPrinter attaches to the Mac's SCSI port, it's a personal printer for use by one Mac only. Unlike the LaserWriter, it can't be directly connected to an AppleTalk local area network for use by several Macs in a work group. However, if you purchase an optional RS-232 serial port for the printer, you could connect the Personal LaserPrinter to the network via a serial device server such as Abaton's Multi-Talk or Solana Electronic's C-Server. As of this writing, though, General Computer had not tested the printer with either device.

The printer is relatively easy to chain with existing SCSI devices. It has two 50-pin connectors and an external switch for setting the SCSI ID number, and it uses external termination. Attaching the Personal LaserPrinter to the SCSI bus means the printer must be on whenever the Mac is on. Although the Personal LaserPrinter prints silently, it does have a constantly blowing fan that's about as loud as a LaserWriter or a noisy hard disk.

And don't think you can hide the Personal LaserPrinter in another room the way you can a LaserWriter. The Personal LaserPrinter, like any SCSI device, can be no more than about 21 feet from the Mac.

What's more, the standard SCSI connecting cable is only a few feet long, and extensions are bulky and expensive.
Serial-port cables can be much longer than SCSI cables, so the serial-port option lets you get the printer away from your desk. The serial-port option also lets you use a Personal LaserPrinter with a 512K Mac. Alternatively, you can add a SCSI port and more memory to a 512K for about the same price as the printer serial-port option. An upgraded Mac clearly provides more versatility.

**Feeding Time**

The Personal LaserPrinter is slightly smaller than a LaserWriter and about half as heavy. Weighing 36 pounds, it measures about 8 inches high, 16 inches wide (excluding the paper tray), and 16 1/2 inches deep.

The standard paper tray holds 150 sheets, 50 percent more than the LaserWriter. It accommodates several sizes of paper, including letter, legal, A4, B5, A5, and half-letter. The paper tray incorporates a manual-feed guide that helps you feed those same paper sizes, plus envelopes. However, the manual-feed guide does not work well with small items such as 3- by 4-inch mailing labels (which the LaserWriter can handle). At press time General Computer had not decided whether to sell large accessory paper trays that hold 500 sheets under the printer. Similar accessory trays are available for other printers that use the same print engine, and they would probably work with the Personal LaserPrinter.

The Personal LaserPrinter normally stacks printed pages face down in a recessed area on top of its cabinet. This automatically places pages in normal ascending page-number order. By contrast, the LaserWriter places printed pages in reverse order, with the last page first. An auxiliary output path on the Personal LaserPrinter puts printed pages in reverse order, but it requires adding an accessory output tray to the printer on the side opposite the paper feed tray.

**Compatibility**

Printer compatibility has been a major bugaboo in the IBM PC world, one that the Macintosh community has avoided because almost all applications use Apple's PostScript for laser printing. While most applications use Apple's LaserWriter driver and LaserPrep file for printing to a laser printer, one exception, PageMaker, supplies its own Prep file, AldusPrep, to send additional PostScript routines to a PostScript-based printer. Now, the appearance of QuickDraw-based laser printers could introduce a new source of incompatibility. Different printers will require their own flavor of printer driver, and users will be forced to find out whether the applications they run behave correctly with a particular printer. It becomes the printer manufacturer's responsibility to ensure compatibility with applications.

Most applications need no modification to print on a Personal LaserPrinter. But some—such as Cricket Draw, PageMaker, and Microsoft Word 3.0—have unique QuickDraw extensions as well as PostScript-specific features. With those applications, you can create objects and effects that appear only when the document is printed on a PostScript device. Adobe Illustrator is even more device-specific, since it's meant to be a PostScript drawing program. General Computer hopes that future releases of the Personal LaserPrinter will be able to print all documents, but until then the QuickDraw printing scheme will continue to pose problems, since not all laser printers will work the same with all applications.

Apple is helping to promote device independence among applications and has recently begun discouraging developers from using device-specific (read PostScript-specific) printing schemes. Developers are working to free their applications from PostScript dependence by using pIComments rather than embedded PostScript commands for special effects.

General Computer's QuickDraw-based laser driver differs from Apple's in the way the Personal LaserPrinter handles nonprinting borders around the page. The Personal LaserPrinter, like the LaserWriter, cannot print right to the edges of a letter-size sheet of paper. The maximum printable area is about 87 1/2 square inches, regardless of paper size; the nonprinting border dimensions change to make up the difference. LaserWriter driver versions 4.0 and higher let you choose a larger printable area, but if you do that you reduce the space for fonts. General Computer does not plan to include this option in the first release of the Personal LaserPrinter driver.

**Printing Comes Full Circle**

The first Mac printer, the ImageWriter, had no page-processing capabilities, relying instead on system software in the Mac to do that. Today's Macs have the power to do the same for 300-dpi laser printers. On a Mac Plus or a Mac SE, the Printing Manager and QuickDraw parts of the Mac's software Toolbox, together with clever printer driver software, can easily match or exceed a LaserWriter's speed and print quality.

The Personal LaserPrinter is the first product to be announced in this new printer category. It can't easily be shared by Macs on an AppleTalk network, and because of the slightly different letter spacing, it may not be the best choice as a proofing device for higher-resolution PostScript typesetters. But it certainly makes LaserWriter-quality printing more affordable for single Macs. People who have the money for a LaserWriter may instead choose a Personal LaserPrinter and spend the difference on souping up their Macs.

See *Where to Buy* for product details.
The results are in. In the February issue we asked readers to vote for their favorite Macintosh products in 39 categories. Although Mac owners generally need no prodding when it comes to voicing their opinions, Macworld offered three prizes as an incentive to respond. The three winners were chosen at random from the thousands.
of responses we received. The grand-prize winner receives a World Class Macintosh system, consisting of a Macintosh Plus, a LaserWriter, and each of the top-voted hardware and software products. The runner-up receives a Macintosh Plus and a copy of each winning software package, and the third-prize winner receives a Macintosh Plus.

The Prizewinners

The grand-prize winner is Scott W. Allen of Woodland Hills, California. Mr. Allen works at an architectural firm in the Los Angeles area, where he uses his Mac to lay out and publish brochures, as well as to keep a database of client information. Mr. Allen also teaches several architecture classes at a community college, using the Mac to produce handouts, to print lab manuals, and to keep track of students' grades. Instead of sending materials to a copy shop to be laser printed, Mr. Allen will now be able to print them with the LaserWriter included with his World Class system.

The second-prize winner is John P. Turner, Jr., an English professor at Humboldt State University in Arcata, California. Mr. Turner uses his Mac to edit and lay out a user group newsletter, to compile bibliographies, and to connect to a local bulletin-board service. While serving as a graduate student adviser, he networked a number of Macs to the university's mainframe, allowing students to log on and contribute to a serial novel.

Our third-prize winner, Suzanne Brooks of Arlington, Virginia, works for a nonprofit organization that provides technical resources for a variety of projects aimed at fostering self-sufficiency in developing countries. Ms. Brooks uses the firm's Mac to write and lay out a newsletter and other publications, including technical manuals. She intends to use her new Mac Plus at home for personal and work-related projects.

The Winning Products

The following table shows the results of our World Class survey. In addition to the winning product in each category, products that received a significant percentage of the votes are listed. The "Others" entry shows the combined percentage for the remaining products; a large number here indicates a large number of contenders in a category. To show the degree of reader interest in particular types of products, we've listed the percentage of survey respondents who voted for products in each category.

Although reader selections should not be construed as endorsement by Macworld, they are an important indication of our readers' preferences. The survey results provide valuable information about what hardware and software products Macworld's readers use, allowing us to tailor our product coverage to meet readers' needs.

There were few surprises in the survey results. Predictably, industry giants Apple and Microsoft had many of the categories sewn up; Apple placed first or second in 10 of the 39 categories, while Microsoft won or placed in 9 of them. There is hope for the little guy, however: Scott Watson's Red Ryder communications program, a veteran of the shareware circuit, placed first in the General Communications category and second in Micro-to-Mainframe Communications.

Another up-and-coming program is Living Videotext's More, which captured significant numbers of votes in several areas. More was in the running in the Project Management and Business Presentation categories; it placed second in both Personal Management and Most Promising Software Newcomer, and it was voted the leading Outline Processor as well. This range of responses is not only a tribute to More, but also shows the versatility of Mac programs in general. When you scan the table, you'll notice several products that make an appearance in more than one category.

If vote percentages are any indication of how our readers are using their Macs, then word processors are the most popular application, followed closely by spreadsheets, graphics, and games. Desktop publishing seems to be going strong as well, with 40 percent of the contestants voting for that category. (Two of our contest winners use PageMaker to produce newsletters and other publications.) The desktop publishing boom may also account for the popularity of the Radius Full Page Display, a large screen that placed first in two hardware categories: Display (Monitor) and Most Promising Newcomer.

We'd like to thank our readers for taking the time to respond. It is, after all, the product users who ultimately decide which products will be successful; we hope to continue the World Class contest next year, giving you another chance to voice your opinions.
### Hardware

<table>
<thead>
<tr>
<th>Category</th>
<th>Product, Manufacturer</th>
<th>% of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Display (Monitor)</strong></td>
<td>Radius Full Page Display, <em>Radius</em></td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>The Big Picture, <em>E-Machines</em></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>MegaScreen, <em>MicroGraphic Images</em></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(26% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td><strong>Hard Disk</strong></td>
<td>Hard Disk 20, <em>Apple Computer</em></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>DataFrame XP-20, <em>SuperMac Technology</em></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Hard Disk-20SC, <em>Apple Computer</em></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>HyperDrive 20, <em>General Computer</em></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>HyperDrive FX-20, <em>General Computer</em></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>DataFrame 20, <em>SuperMac Technology</em></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(44% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td><strong>Alternate Mass Storage</strong></td>
<td>Apple 800K External Drive, <em>Apple Computer</em></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Bernoulli Box 20 + 20, <em>Iomega Corp.</em></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Apple 400K External Drive, <em>Apple Computer</em></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(16% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td><strong>Input Device</strong></td>
<td>Turbo Mouse, <em>Kensington Microware</em></td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Apple Mouse, <em>Apple Computer</em></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Softstrip, <em>Causzis Systems</em></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>MacTablet, <em>Summagraphics</em></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Numeric Turbo, <em>Cambridge Automation</em></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>A+ Mouse, <em>Mouse Systems Corp.</em></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(17% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td><strong>Macintosh CPU Upgrade</strong></td>
<td>Prodigy 4, <em>Levco</em></td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>TurboMax, <em>MacMemory</em></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>HyperDrive 2000, <em>General Computer</em></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>(15% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Hardware</td>
<td>% of Votes</td>
<td>Product, Manufacturer</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Printer–Dot Matrix</td>
<td>77</td>
<td><strong>ImageWriter II, Apple Computer</strong></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td><strong>ImageWriter, Apple Computer</strong></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(51% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Digitizer/Scanner</td>
<td>65</td>
<td><strong>ThunderScan, Thunderware</strong></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Abaton Scan 300, Abaton Technology Corp.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>M*Vision, I.T Industries</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>ASI 'TurboScan, AST Research</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>PC Scan Plus, Dest</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(28% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Modem</td>
<td>20</td>
<td><strong>Smartmodem 2400, Hayes Microcomputer Products</strong></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Smartmodem 1200, Hayes Microcomputer Products</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Apple Personal Modem, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Courier 2400, USRobotics</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Apple Modem 1200, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(29% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Printer–Laser</td>
<td>96</td>
<td><strong>LaserWriter/LaserWriter Plus, Apple Computer</strong></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(38% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Plotter</td>
<td>36</td>
<td><strong>HP 7475A, Hewlett-Packard</strong></td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>HP ColorPro, Hewlett-Packard</td>
</tr>
<tr>
<td></td>
<td>51</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(5% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Product, Manufacturer</td>
<td>% of Votes</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Network Server</td>
<td>TOPS, Centram, 3Server, 3Com, Others</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(9% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Most Promising Newcomer</td>
<td>Radius Full Page Display, Radius</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Dynamac, Dynamac Computer Products</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Softstrip, Cauzin Systems</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>The Big Picture, E-Machines</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(19% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>Microsoft Word, Microsoft Corp.</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>MacWrite, Apple Computer</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>WriteNow for Macintosh, TMaker</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(76% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microsoft Excel, Microsoft Corp.</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Microsoft Multiplan, Microsoft Corp.</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(61% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FileMaker/FileMaker Plus, Forethought</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Helix/Double Helix/Multiuser Helix, Odesta Corp.</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Reflex for the Mac, Borland International</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Omnis 3, Blyth Software</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Microsoft File, Microsoft Corp.</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>OverVue, ProVue Development</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(48% of respondents voted in this category)</td>
<td></td>
</tr>
</tbody>
</table>
Utilities—Disk and File

<table>
<thead>
<tr>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>Copy II Mac, Central Point Software</td>
</tr>
<tr>
<td>12</td>
<td>Fedit Plus, MacMaster Systems</td>
</tr>
<tr>
<td>37</td>
<td>Others</td>
</tr>
<tr>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(35% of respondents voted in this category)</td>
</tr>
</tbody>
</table>

Utilities—Programming

<table>
<thead>
<tr>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>ResEdit, Apple Computer</td>
</tr>
<tr>
<td>7</td>
<td>Tempo, Affinity Microsystems</td>
</tr>
<tr>
<td>7</td>
<td>Fedit Plus, MacMaster Systems</td>
</tr>
<tr>
<td>7</td>
<td>QUED, Paragon Concepts</td>
</tr>
<tr>
<td>6</td>
<td>TMON, ICOM Simulations</td>
</tr>
<tr>
<td>5</td>
<td>MacNosy, Jasik Designs</td>
</tr>
<tr>
<td>50</td>
<td>Others</td>
</tr>
<tr>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(11% of respondents voted in this category)</td>
</tr>
</tbody>
</table>

Communications—General

<table>
<thead>
<tr>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>Red Ryder, FreeSoft</td>
</tr>
<tr>
<td>16</td>
<td>Smartcom II, Hayes Microcomputer Products</td>
</tr>
<tr>
<td>14</td>
<td>MicroPhone, Software Ventures</td>
</tr>
<tr>
<td>13</td>
<td>MacTerminal, Apple Computer</td>
</tr>
<tr>
<td>16</td>
<td>Others</td>
</tr>
<tr>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(33% of respondents voted in this category)</td>
</tr>
</tbody>
</table>

Programming Language

<table>
<thead>
<tr>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Microsoft BASIC, Microsoft Corp.</td>
</tr>
<tr>
<td>15</td>
<td>Lightspeed Pascal, Think Technologies</td>
</tr>
<tr>
<td>13</td>
<td>TML Pascal, TML Systems</td>
</tr>
<tr>
<td>11</td>
<td>Turbo Pascal, Borland International</td>
</tr>
<tr>
<td>11</td>
<td>LightspeedC, Think Technologies</td>
</tr>
<tr>
<td>25</td>
<td>Others</td>
</tr>
<tr>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(32% of respondents voted in this category)</td>
</tr>
</tbody>
</table>

Integrated Products

<table>
<thead>
<tr>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Microsoft Works, Microsoft Corp.</td>
</tr>
<tr>
<td>28</td>
<td>Microsoft Excel, Microsoft Corp.</td>
</tr>
<tr>
<td>16</td>
<td>Jazz, Lotus Development Corp.</td>
</tr>
<tr>
<td>6</td>
<td>Others</td>
</tr>
<tr>
<td>100</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>(50% of respondents voted in this category)</td>
</tr>
</tbody>
</table>
# Software

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Votes</th>
<th>Product, Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop Publishing</td>
<td>56</td>
<td>PageMaker, Aldus Corp.</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>ReadySetGo, Manhattan Graphics/LetraSet</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total (40% of respondents voted in this category)</td>
</tr>
<tr>
<td>Graphics–CAD</td>
<td>47</td>
<td>MacDraft, Innovative Data Design</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>MacDraw, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>MiniCad, Diehl Graphsoft</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Mac3D, Challenger Software Corp.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>MacG3D, CompuServeCo</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total (17% of respondents voted in this category)</td>
</tr>
<tr>
<td>Accounting</td>
<td>27</td>
<td>Insight, Layered, Inc.</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Rags to Riches, Chang Labs</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Dollars and Sense, Monogram</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Back to Basics, Peachtree Software</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total (40% of respondents voted in this category)</td>
</tr>
<tr>
<td>Graphics–Business Presentation</td>
<td>37</td>
<td>Cricket Graph, Cricket Software</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Microsoft Chart, Microsoft Corp.</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Microsoft Excel, Microsoft Corp.</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>MacDraw, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>More, Living Videotext</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total (31% of respondents voted in this category)</td>
</tr>
<tr>
<td>Graphics–Paint/Draw/Animation</td>
<td>29</td>
<td>FullPaint, Ann Arbor Softworks</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>SuperPaint, Silicon Beach Software</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>MacPaint, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>MacPaint, Apple Computer</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Cricket Draw, Cricket Software</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Others</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>Total (50% of respondents voted in this category)</td>
</tr>
<tr>
<td>Category</td>
<td>Product, Manufacturer</td>
<td>% of Votes</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Project Management</td>
<td>MacProject, Apple Computer</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Micro Planner Plus, Micro Planning Software</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>More, Living Videotext</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total (17% of respondents voted in this category)</td>
<td>100</td>
</tr>
<tr>
<td>Outline Processing</td>
<td>More, Living Videotext</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Acta, Symmetry Software</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>ThinkTank/ThinkTank 512, Living Videotext</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Total (27% of respondents voted in this category)</td>
<td>100</td>
</tr>
<tr>
<td>Personal Management</td>
<td>Dollars and Sense, Monogram</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>More, Living Videotext</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Sidekick, Borland International</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Home Accountant, Haahai/Arrays, Inc.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MacMoney, Survivor Software</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Total (12% of respondents voted in this category)</td>
<td>100</td>
</tr>
<tr>
<td>Games</td>
<td>Microsoft Flight Simulator, Microsoft Corp.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Dark Castle, Silicon Beach Software</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Déjà Vu, Mindscape</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MacGolf, Practical Computer Applications</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Uninvited, Mindscape</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Wizardry, Sir-Tech Software</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Airborne, Silicon Beach Software</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sargon III, Hayden Software</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Shanghai, Activision</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>The Ancient Art of War, Broderbund Software</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Gato, Spectrum HoloByte</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Total (53% of respondents voted in this category)</td>
<td>100</td>
</tr>
</tbody>
</table>
## Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Product, Manufacturer</th>
<th>% of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Planning/Preparation</td>
<td>MacInTax, SoftView</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Microsoft Excel, Microsoft Corp.</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Forecast, Monogram</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(13% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Statistics/Math</td>
<td>StatView 512+ BrainPower</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>StatWorks, Cricket Software</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Systat, Systat</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>PowerMath, Industrial Computations</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MacSpin, D² Software</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(12% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Spelling Checker</td>
<td>MacLightning, Target Software</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Spelliswell, Working Software</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Thunder, Batteries Included/Electronic Arts</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>MacSpell+, Creighton Development</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(35% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>ConcertWare + Great Wave Software</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Deluxe Music Construction Set, Electronic Arts</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Studio Session, Impulse, Inc.</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>MusicWorks, Hayden Software</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>ConcertWare + MIDI, Great Wave Software</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Professional Composer, Mark of the Unicorn</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Performer, Mark of the Unicorn</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(18% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Desk Accessory</td>
<td>SideKick, Borland International</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Battery Pak, Batteries Included/Electronic Arts</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Smart Alarms, Imagine Software</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MockPackage, CE Software</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>TopDesk, Cortland Computer</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Tempo, Affinity Microsystems</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Acta, Symmetry Software</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(34% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Product, Manufacturer</td>
<td>% of Votes</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Micro-to-Mainframe Communications</td>
<td>MacTerminal, Apple Computer</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Red Ryder, FreeSoft</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>VersaTerm, Peripherals, Computers, &amp; Supplies, Inc.</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(8% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>File Server</td>
<td>MacServe, Infosphere</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>TOPS, Centrum</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(10% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Financial/Investment</td>
<td>Dollars and Sense, Monogram</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Market Pro, Pro Plus Software</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>MacMoney, Survivor Software</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Profit Stalker II, Button down Software</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Market Manager Plus, Dow Jones</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Microsoft Excel, Microsoft Corp.</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(8% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Education/Training</td>
<td>Typing Tutor III, Simon and Schuster Computer Software</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>KidsTime, Great Wave Software</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>ChipWits, BrainPower</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Geometry, Broderbund Software</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>MacType, Palantir Software</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(12% of respondents voted in this category)</td>
<td></td>
</tr>
<tr>
<td>Most Promising Newcomer</td>
<td>SuperPaint, Silicon Beach Software</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>More, Living Videotext</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Cricket Draw, Cricket Software</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>WriteNow for Macintosh, T Maker</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Guide, OWL Software</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Trapezew, Data Tailor</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>(50% of respondents voted in this category)</td>
<td></td>
</tr>
</tbody>
</table>
The key to publishing productivity is finding a program that meets your needs

by Jim Heid

If a psychologist used the phrase *desktop publishing* in a word association test, the likely response would be "newsletters." Microcomputer page-layout programs are so strongly associated with pint-size periodicals that it's often hard to imagine them being used for anything else.

But they are. A survey of the desktop publishing field reveals a diverse set of applications ranging from brochures and business plans to newsletters and technical publications. Corresponding to these applications is an accordingly diverse set of requirements. For example, a program that's suitable for publishing a book may not be appropriate for producing an advertisement. If you're preparing to publish, you should first assess the demands of the job and learn which collection of product features best satisfies those demands. Learning how to identify your requirements will go a long way toward helping you select the best desktop publishing software for the work at hand.

This overview of common desktop publishing applications (and the features they require) is designed to help you decide what type of software is most appropriate for your needs. Under each group of applications you'll find descriptions of the various programs that best accomplish the necessary tasks. However, nothing can take the place of an in-depth product review. Before making a purchasing decision, you should read individual reviews and carefully evaluate each product on its own merits.

Some of the products mentioned here are designed specifically for desktop publishing; others are word processors or drawing programs whose text-formatting capabilities allow them to infiltrate the desktop publishing camp. It's important to remember that there are few sharp boundaries delineating publishing applications and program categories. A program's absence from one category doesn't necessarily mean it can't tackle that application, only that other programs are better suited for it.

**Periodicals**
Applications: *newsletters, magazines*. Products: *PageMaker, ReadySetGo, Scoop, XPress*. Newsletters don't own the desktop publishing field, but they may have a controlling interest. All the leading publishing programs cater to the kind of periodical publishing that businesses, special interest groups, and entrepreneurs have embraced with a vengeance. And because newsletter publishing requires a well-rounded mix of capabilities, a program that's suited to newsletters can also handle many other publishing tasks, such as reports, short books, and manuals.

Like most publications, newsletters usually have a consistent design from page to page and from issue to issue, and require certain text and graphic elements,
such as issue dates and rules, to repeat on each page. 

PageMaker pioneered master pages—special work pages for holding elements that appear on every page. You can create separate master pages for left- and right-hand pages and hide the master elements on pages that have a unique design. ReadySetGo 3.1, XPress, and Scoop offer similar master-page features. (At press time, Scoop was still a prerelease product. Scoop's manufacturer, Target Software, claims the program will be available by the end of summer.)

Newsletter publishing almost always means multicolumn pages; a program that lets you easily create and adjust them is a must. PageMaker's Column Guides command lets you create up to 20 equally spaced columns on a page. To create columns of unequal width, drag the column guides after PageMaker creates them. ReadySetGo lets you choose from 8 pre-set design grids containing from 1 to 8 columns, or create a custom grid with any number of columns and rows (rows are horizontal dividing lines). Scoop provides similar custom grid features and adds a Place Columns command that creates columns within a selected area, letting you mix and match column layouts on the same page. Unequal-width columns with ReadySetGo, Scoop, and XPress require more work than with PageMaker; however, because you can't drag the guides the program creates.

The columns in periodicals are usually narrow, and narrow columns impose an aspirin bottle's worth of text-handling headaches. If the columns have a ragged right margin, the degree of ragging—each line's relationship to the right margin and to the lines above and below it—influences the overall appearance of the
text. Ragged columns whose right edges vary wildly, with some lines falling far short of the full measure, can detract from the page and waste space. In justified columns, words too long to fit on a line force the program to add grand canyons of space between words and letters to justify the line.

Both headaches can be remedied by an automatic hyphenation facility. *Dictionary-based* hyphenation such as *PageMaker*’s is the most accurate but tends to be slower than the *algorithmic* (rule-based) hyphenation offered by XPress, Scoop, and ReadySetGo. Those three also provide *exception dictionaries* to which you can add error-prone words like *program*. Another feature that helps bridge the word gaps in justified text is the ability to control the maximum amount of space added between words and letters.

The articles in periodicals usually span more than one column and often continue on subsequent pages. *Text reflow*—the ability to break lines and reshuffle the text in a lengthy story as it’s edited—is a godsend to anyone who’s peeled and pasted strips of type after a last-minute edit. With ReadySetGo, Scoop, and XPress, creating a linked story means first creating *text blocks* in each location where the story will appear, then linking the blocks by clicking the mouse pointer within each. *PageMaker* makes it a bit easier by automatically creating text boxes and the link between them as you place a lengthy document.

Periodicals usually contain illustrations, so graphics support is a must. All four programs discussed here can place *MacPaint-* and PICT-format images. *PageMaker* and ReadySetGo’s TIFF support is useful for placing scanned photographs, as is Scoop’s ability to place graphics created with Abaton’s G-Scan 300 scanner. All support the EPS format, allowing them to place graphics created with Adobe’s *Illustrator* and Cricket’s *Cricket Draw*.

A variation on the graphics theme involves enhancing your pages with rules or shapes such as boxes and circles, a requirement all four programs meet with drawing tools and the ability to draw rules of various weights and styles. The four also let you create shaded rules and shapes. Scoop is the shadiest of the bunch, offering shades from 0 percent (white) to 100 percent (black) in 1 percent increments. Newsletter production is a layout-intensive task, and the better equipped your electronic layout table is, the sooner you can go home. Features that streamline interactive page layout include on-screen measuring rulers, various viewing scales for viewing pages in different degrees of magnification, a page palette or Go To Page command for quickly jumping to a certain page, and “snap-to” column guides and grid lines, which allow fast, precise positioning by exerting a pull on elements dragged near them.

**The better equipped your electronic layout table is, the sooner you can call it a day.**

---

**The Forms Generation**


Another layout-intensive publishing application is the production of forms—those rule-riddled pages that hold everything from credit histories to personnel information to insurance claims. The primary requirement for forms production is a program that can mix text with rules and boxes, and that streamlines the layout process with on-screen rulers, snap-to grids and
guides, and the other layout tools mentioned earlier. The newsletter production programs just discussed meet those needs handily. XPress and ReadySetGo are especially adept at forms creation. To create a series of parallel rules, for example, you draw one rule, choose XPress's Step and Repeat command, and specify the spacing between rules and the number of times the rule should repeat. Click OK, and XPress replicates the rule in a flash. ReadySetGo's Duplicate Object command lets you perform the same operation. Scoop also provides a Duplicate command to quickly copy a selected shape.

Drawing programs like MacDraw and Cricket Draw also make good forms-production tools. And if your forms will be holding data that would benefit from computerized storage, consider one of the many database managers that provide form-design features. FileMaker Plus, Microsoft File, dBase Mac, Business Filevision, Reflex, and Helix all provide interactive layout capabilities that let you create attractive forms.

**Flashy Jobs**


The first generation of desktop publishing programs couldn't measure up to the standards set by
professional designers and type houses. Their click-and-drag, interactive styles were ideal for laying out graphically complex publications, but they lacked the features necessary for producing top-notch typography and runarounds—text whose margins vary to flow around the nooks and crannies of an irregularly shaped graphic. Today, several programs provide excellent typographic control, and three—XPress, ReadySetGo, and Scoop—can automatically create runarounds with an ease that would make many typographers’ jaws drop.

Producing high-quality type requires control over interletter and interword spacing. Automatic pair kerning features, found in PageMaker, XPress, and Scoop, use the kerning tables that are built into most PostScript fonts to improve the appearance of letter pairs such as To and Yo. Manual kerning commands, available in the aforementioned programs as well as in ReadySetGo, let you specify the amount of space between letters. PageMaker and XPress accept kerning values in fractional increments of an em space, while ReadySetGo and Scoop require values in points. Because the width of an em depends on the text’s font and size, the manual kerning facilities in PageMaker and XPress are more precise and better suited to fine-tuning text in 16-point and smaller fonts.

Another common typographic trick involves removing or adding space between each character in a line or block of type. Known as tracking control, this technique lets you tighten the letter-spacing in a headline to achieve a common effect typographers often call TNT—tight but not touching. (The readability of text decreases dramatically when characters overlap.) XPress, ReadySetGo, and Scoop allow tracking control, with XPress offering the most precision by accepting values in increments of 1/100 em space.

Display advertisements, product packaging designs, and magazines often use large text that has been stretched (expanded) or compressed (condensed) for an added visual effect. With XPress and Scoop, you can alter the width of text directly by simply selecting the text, choosing a command, and selecting a scaling value. PageMaker lacks scaling commands, but you can achieve the same effect by typing a headline in MacDraw, copying it to the Clipboard, then pasting it into the publication and resizing it as you would a picture. One drawback of this workaround is that you can’t edit the text or change its style.

A Spot of Color
Applications: publications that will be printed with spot color. Products: XPress, Scoop, Cricket Draw.

Color adds a great deal to a publication, if you have the budget for it. XPress and Scoop are the first Mac publishing programs that allow you to use spot color—single colors used for elements such as rules and headlines.

With XPress, adding spot color is a matter of selecting some text or a graphic element, choosing the Modify command, and selecting from a palette of eight colors. To separate the colors for printing, you choose the Print command and click the Make Separations check box, and for each color XPress prints a separate copy of the page, with registration marks that a printer will use to align the colors.

Figure 3
Flashy indeed. Designer Ann Cochran used Adobe Illustrator to create the display type and art for this layout, and then assembled the tabloid-size page in PageMaker. Adobe’s new Separator DA was used to produce four film negatives for the color.
Scoop's approach to color is more complex. A Scoop document comprises eight overlapping planes, one each for black, cyan, magenta, yellow, white, red, green, and blue. All text and graphics you place are initially on the black plane, but you can move any object to any other plane by selecting the object and using Scoop's Change Plane command. The advantage of this approach is that you can selectively "turn off" any or all planes, allowing you to see only those objects for a given color. Like XPress, Scoop can separate the colors at printing time.

The Business End of Publishing

Applications: executive summaries, profit and loss statements, departmental reports, business plans. Products: Ragtime.

Managers responsible for producing business plans and weekly or monthly reports often need publishing programs that let them include figures from a spreadsheet. While any interactive publishing program can meet that need through the Mac's Clipboard, a harried manager may not have time to grapple with Cut and Paste commands.

One possible solution is Ragtime, which combines spreadsheet features with an easy-to-use desktop publishing foundation (see Reviews, Macworld, February 1987). Ragtime lets you create a spreadsheet "frame" anywhere within a publication. Its spreadsheet features would never be mistaken for those of Microsoft Excel, but they are complete enough for many business tasks. Publishing features such as kerning, on-screen rulers, automatic hyphenation, and the ability to read formatted word processing documents are missing from its desktop publishing toolbox, but considering the program's business slant, these omissions probably aren't drawbacks. A manager who doesn't have time to cut and paste isn't likely to be snuggling a lowercase o under a capital T.

The Joy of Text


For some people, desktop publishing means being able to produce books and manuals at a fraction of the cost of conventional typesetting and production. Such lengthy jobs can be handled by a general-purpose interactive publishing program like PageMaker, but only up to a point. Projects requiring hundreds of pages, tables of contents, indexes, footnotes, and formulas call for a program with industrial-strength text handling talents—even if those talents come at the expense of simplicity.

One such program is Microsoft Word 3.0. It's billed as a word processor, but Word 3.0 has enough text-formatting features to pass muster for some book publishing tasks. A single Word 3.0 document can be up to a half-million characters in length, although only a high-stakes gambler would trust roughly 600 single-spaced pages to one document. However, an index in Word 3.0 is limited to 1500 entries. Also, with the initial Word 3.0 release many people reported problems handling long documents—problems Microsoft claims to have fixed in its 3.01 version, but at press time users had not begun to test the newer version.

A safer approach is to divide a publication into separate but linked documents. Linking documents allows Word to maintain continuous page numbering and to generate a table of contents and an index. You create the latter elements by typing codes such as .T. where you want each index and table-of-contents entry, then formatting the codes in Word's hidden font style. You can also create a complex formula—the bane of a typesetter's existence—by typing single-letter codes that indicate such components as arrays and square roots.

At U.S. West Direct in Seattle, Gary Jaycox is setting up a system that enables salespeople selling Yellow Pages ads for the regional phone company to produce their own color mock-ups. Sales staffers create the ads in CricketDraw and Illustrator, and then use XPress's spot-color function to make separations for red and black elements. A Canon copier combines the laser-printed separations to produce 300-dpi, two-color proofs.
Common Ground

Regardless of the kinds of publications you produce, you'll want to examine how the publishing programs you evaluate handle the basics. Because every desktop publishing task involves working with text, text-manipulation features form the core of a desktop publishing program. Some, most notably PageMaker, take a minimalist approach to text editing. The manufacturers of these programs recommend that you use a separate word processor to create text, and that you use their programs' lightweight editing features for correcting typos, creating captions and headlines, and making minor revisions.

But more publishing programs are adding word-slinging features. XPress and ReadySetGo 3.0 offer search-and-replace commands; ReadySetGo provides the ability to search and replace both text and formatting attributes. Both these programs, as well as Scoop, also offer spelling checkers. ReadySetGo 3.0 has a glossary that holds common words and phrases for quick recall. Such features are useful, but they're far from vital. For one thing, the people who lay out the pages aren't always the same ones who write the text, and writers tend to have favorite word processors that fit them like an old pair of slippers.

A more basic reason is that desktop publishing programs don't make good word processors—which is why most publishing programs can read and retain the formatting of documents created with popular word processors. The layout-table metaphor and the approach to handling a single article as a series of linked blocks or frames impose restrictions and extra steps that distract from the writing process.

Text-processing features may not be vital, but text-formatting features are. All publishing programs allow multicolumn pages of various sizes and orientations and can automatically reflow text throughout an article after editing changes. Other formatting options include tabs for aligning columns of numbers in tables, commands for adjusting the spacing between words and letters in justified type, and commands for controlling leading, the horizontal spacing between lines.

But few publications live by text alone. Most desktop publishing programs allow you to paste graphics from the Mac's Clipboard and, better still, to directly place MacPaint and PICT-format graphics. PageMaker, Scoop, and XPress can also place graphics stored in encapsulated PostScript format (EPS) that many illustration and drawing programs support, and in the tagged image file format (TIFF) that many scanners use. (For basics on graphics file formats, see "Getting Started with Graphics," Macworld, July 1987.)

Word 3.0 lacks the what-you-see-is-what-you-get (WYSIWYG) layout features of an interactive publishing program. Columns don't appear alongside each other on screen, for example, and headers, footers, and footnotes don't appear in their final position. Fortunately, however, the Page Preview command lets you see how the final product will look and make adjustments in margins and in header and footer positions.

Word 3.0 is an adequate book-publishing tool, but it lacks the fine typographic control necessary for producing high-quality books. It can't, for example, kern text or justify margins by altering interletter as well as interword spacing. Two products in the book-publishing league that provide this control are MacTeX and TeXtexts; the latter was still in development at press time. Both programs are versions of the TeX (pronounced tech) typesetting language developed by Stanford University professor Donald Knuth for the production of his equation-laden Art of Computer Programming book series.

These TeX-based products, and Knowledge Engineering's Just Text, are command-driven publishing programs. Instead of providing WYSIWYG displays and enabling you to position elements by clicking and dragging, they rely on typed formatting commands to specify margins, type styles and sizes, word-spacing values, and all the other measurements necessary to produce a page.

Using command-driven programs is similar to using a conventional phototypesetting machine. Both require a large investment in learning time, but they reward the investor with capabilities that WYSIWYG programs only dream of. MacTeX, for example, can produce text in sizes from 1 point to 2048 points, ver-
sus most WYSIWYG programs' 4- to 127-point range. And both Mac\TeX and Textures provide preview windows that show what your commands produce. Mac\TeX also makes thinking in codes less intimidating because of its ability to translate formatted Word and MacWrite documents.

**Using command-driven programs is similar to using conventional phototypesetting machines.**

\TeX-based products also let you create formatting macros—entire series of \TeX commands that you can refer to by a single name. If you define macros that govern a publication's appearance, you can make wholesale formatting changes in a flash by editing the appropriate commands in the macro, rather than editing hundreds of individual commands throughout the publication. Entire libraries of canned \TeX macros are available for producing books and other lengthy documents. Canadian graphic arts giant McCutcheon Graphics has released Page One, a series of 50 \TeX templates for book publishing.

With layout-table-style programs, the temptation is great to make last-minute edits on the pasted-up text rather than in the original files, which would leave you with two different versions. But with a command-driven program, you work only with the original files, adding formatting commands that define or revise the publication's appearance. Therefore, a command-driven program eliminates the need to go back and revise the original files to match changes in the pasted-up text. This is an important consideration if you're working on publications that require frequent revisions or that contain sections you plan to reuse in other issues.

**Other Deciding Factors**

Because it's difficult to typecast a type-casting program, don't base your decision on features alone. Narrow your search to the products that appear to meet your needs, then try each to evaluate its operating style. You'll spend a long time at your electronic layout table; make sure it feels comfortable. Assess how each program handles the basic tasks that are common to every application (see "Common Ground"). Determine how well the product will run on your hardware. PageMaker and XPress tend to be sluggish on 512K Macs, for example, and both Aldus and Quark recommend a Mac Plus. Scoop doesn't run on 512K Macs, but requires at least a 512K Enhanced.

And ask questions. What kind of support does the manufacturer provide? How thorough is the documentation? Is the product shackled by copy protection? (Of the products discussed here, only XPress is.) By being an informed and critical shopper, you'll find the right tool for turning your words into type.

See Where to Buy for product details.
Beefing Up the SE

Think that because you have a Mac SE, you have to settle for less performance? Think again. Accelerator cards for the Mac SE make even the Mac II look a bit slow.

by Prasad Kaipa and Bruce Webster

Face it: you wanted a Macintosh II, but you bought a Mac SE. You didn’t have the money to get a Mac II at the time, and you just weren’t willing to wait. Or money wasn’t the issue, but time was: you didn’t want to sit around until the Mac II finally shipped. Whatever the reason, it’s a Mac SE, not a Mac II, that’s sitting on your desk, and you’re getting tired of reading the glowing reports of the Mac II’s great performance. If only you could squeeze a 68020/68881 combination into your system.

Cheer up, pilgrim: you can. In fact, you can actually get better performance. True, it won’t come cheap, but it will come cheaper than a Mac II. Besides, have you ever tried to fit a Mac II into one of those carrying cases?

Levco Corporation (Levco) and General Computer Company (GCC) have been going head-to-head for some time now in the Macintosh market, playing a constant game of one-upmanship to see who can soup up the Mac the most. The newest battleground is the Mac SE: both Levco and GCC have introduced 68020/68881 coprocessor boards. And they aren’t the only ones. Peak Systems and Radius Corporation also recognize a good opportunity when they see one and are plunging into the battle.

Levco Prodigy SE

Levco has long been known for its legendary (both in power and cost) Prodigy 4 upgrade, a 68020/68881 4-megabyte RAM, 20MB hard-disk package that turned an ordinary Mac into a true high-performance monster more than a year before Apple offered the Mac II. So it comes as no surprise that Levco has been quick to introduce a similar product for the Mac SE.

The Levco Prodigy SE does its best to turn your SE into a Mac II. No modifications are needed: the upgrade plugs into the expansion port on your Mac SE motherboard. Of course, getting it there can be a challenge. Even though Levco includes a detailed installation manual, you’re probably best off leaving the actual work to your dealer, especially as the price you pay for the upgrade includes installation.

The heart of the Prodigy SE is a Motorola 68020 processor running at 16 mega-hertz (MHz) and using a 32-bit-wide data path. By contrast, the Mac SE comes with an 8-MHz 68000 processor that uses a data path 16 bits wide. The combination of doubled clock speed and widened data path gives you an immediate fourfold increase in speed. Additional speed can come from...
the 68020's instruction cache and the power of certain 68020 instructions.

If it's number-crunching speed you're looking for, consider the optional Motorola 68881 math coprocessor chip. This special chip performs floating-point operations much faster than the 68020 does—over 100 times faster for certain applications. Apple was smart enough to make this equipment standard on the Mac II; you should strongly consider getting it if you're getting a coprocessor board.

The Prodigy SE also comes with 1MB of RAM, doubling the Mac SE's memory. That memory can—in theory, mind you—be expanded to 32MB. A more realistic limit, based on 1MB chips, is 8MB, and even that exceeds the Mac SE's normal limits for user memory. It may also exceed your pocketbook, since 1MB chips are still pricey. You have to use Levco's memory expansion units, but since they're cheaper than Apple's, that's not necessarily bad. Note that all memory added to the board uses the 32-bit-wide data path, which leads to higher performance.

The Mac SE is only set up to use 4MB of RAM; what if you decide to expand beyond that? You'll need to get the Motorola 68851 Paged Memory Management Unit (PMMU), a chip that makes the SE think it only has 4MB at any one time. The Mac II has a socket for this same chip; you need the PMMU to run A/UX, Apple's version of UNIX, on the Mac II. Will you be able to run A/UX on a Prodigy SE with a 68851? Stick around and find out.

What if you want a large-screen display for your Mac SE? The engineers at Levco anticipated that the Prodigy SE has a 125-pin expansion port that is (according to Levco) a superset of the expansion port on the Mac SE motherboard. We were unable to test anything using this port; however, Levco says that at least one large-screen display—Micrographic Images' MegaScreen II—works just fine.

Software support is fourfold. First, on boot-up the Prodigy SE automatically copies the contents of the SE ROM (about 160K) into its high-speed RAM. This greatly improves performance, since all ROM routines can be accessed and executed at the 16-MHz clock speed.

Second, once you place a special Init file into the System Folder, you can control certain aspects of the Prodigy SE from the Control Panel. For example, you can turn the 68020 cache on or off, route SANE (Standard Apple Numerics Environment) calls to the 68881, or allow MacWrite 4.5 to run on the system. See "Speed Traps" for more details.

Third, Levco says that the Prodigy SE supports a recoverable, bootable RAM disk. This RAM disk is unaffected by system crashes or resets; only a power loss (turning off the machine, for example) can modify the disk's contents. Likewise, if the system does reboot, it checks the RAM disk first to see if you have the System files for booting there. Unfortunately, we did not receive the software for this RAM disk with the Prodigy SE we received, so we cannot attest to how well this feature actually works. In addition, the version of the software that we did receive did not recognize the interrupt switch properly, but it should work just fine by the time you read this.

Fourth, you can turn the souped-up SE back into a normal machine. By pressing the interrupt and reset switches on the side of the Mac SE in a certain order, the system reboots as a plain-vanilla 8-MHz 68000-based Mac SE. This allows you to run any applications (like games or programs that violate 68020 conventions) on your system.

The Prodigy SE is not cheap: $1495 for the basic board (68020 with 1MB of RAM). The 68881 chip costs another $295; add $500 if you opt for 2MB of RAM instead of just 1. The 4MB version lists for $2795. The price for the 68851 was not available at press time. Levco has been shipping the Prodigy SE since the end of March.

GCC HyperCharger 020

General Computer Company is well known for having introduced the first (and for a long time, the only) internal hard disk for the Macintosh. When that market started to get a little crowded, GCC introduced the HyperDrive 2000, a 12-MHz 68000/68881 1.5MB RAM, 20MB hard-disk combination that, while not nearly as fast as the Prodigy 4, was substantially cheaper. However, GCC's newest product, the HyperCharger 020, is comparable to Levco's Prodigy SE in price and is as fast or faster in performance.

The HyperCharger 020 for the Mac SE represents GCC's first foray into the 68020 upgrade market. Like the Prodigy SE, the HyperCharger 020 plugs into the SE's expansion port. And like the Prodigy, the HyperCharger comes with a 16-MHz 68020 processor (with a data path 32 bits wide), 1MB of RAM, and a socket for a 68881 coprocessor. While the HyperCharger comes standard with a 12-MHz 68881, you can order an optional 16-MHz 68881. If you choose the latter, the resulting performance improvements are almost identical to those of the Prodigy SE. In fact, the floating-point operations tend to be faster.
Speed Traps

Accelerator boards are real time-savers: they increase performance, sometimes dramatically, and they make your system nicer to use. Are there any drawbacks? Unfortunately, yes. Just as there are incompatibilities between the Macintosh II and some Mac software, there are incompatibilities between some software and the Mac SE accelerator boards. The difference is that you can often work around those incompatibilities with the SE boards.

Cache Crash

The biggest potential pitfall has to do with the 68020's instruction cache. The cache is a small amount of memory on the chip itself, enough to hold 64 instructions. As the 68020 loads instructions from RAM, it copies them into this cache. When the 68020 goes to fetch the next instruction, it checks first to see if that instruction is in the cache; if so, it loads it from there instead of from RAM. This procedure improves performance, since it takes less time to fetch an instruction from the cache than to get it from RAM. And if you have a tight loop that fits entirely in the cache, the speed-up can be significant.

Unfortunately some programs—particularly those that are copy protected—use a technique known as self-modifying code. Briefly put, this involves a set of instructions that change themselves as they execute. A different but related technique may be used in the code produced by some compilers. Certain low-level routines, such as the routine for disk I/O, are not called directly by the compiled code. Instead, the code (when executed) generates a set of instructions elsewhere in memory, then calls those instructions to perform the function.

The problem with both types of programs is that, under certain conditions, the instructions in the cache do not match those in memory. The result is erratic behavior: failure to pass the copy-protection test, or even a system crash. The obvious answer is to turn off the 68020 cache; unfortunately it is not so simple. If the 68020 cache is not on, AppleTalk does not work reliably. Both Leveco and GCC allow you to turn the 68020 cache on and off via the Control Panel; the Mac II does not. This means that you can run programs on these souped-up SEs that you can't run on the Mac II.

Cruise Control

A second problem has to do with code compatibility. Some programmers have used certain instruction shortcuts on the 68000 that do not work properly on the 68020. These programs will not work with an accelerator board unless the board provides a 68000 mode (the Prodigy SE and the Radius do this).

MacWrite 4.5, for example, will not run on a 68020-based system. Because MacWrite is so widely used, both Leveco and GCC put a special option in the Control Panel that compensates for the problems of MacWrite 4.5. The drawback is that with the option on, the entire system slows down. At press time Apple was working on MacWrite 4.6, which will run on the Mac II or a souped-up SE.

Vid Skids

Yet another problem has to do with video memory. Despite Apple's years of warnings, there are programs out there—especially games—that make assumptions about the location and size of video memory, or about the existence of a second video buffer. Most of these programs simply will not run on the Macintosh II, and many have problems with the accelerator cards. For example, Leveco uses the second video buffer, and some games (like Dark Castle from Silicon Beach) attempt to access the second video buffer, which causes the system to crash. Silicon Beach is trying to modify its programs to run properly on the Prodigy SE, but new Apple specifications make it very hard. In any case, it's wise to test new programs on an upgraded system before you buy.

If you want to be sure that certain programs will run on your machine, check with your dealer before you buy an upgrade. A dealer can verify which accelerator card will run which software.

Speed Limits

Finally, there's the problem of speed itself. Some programs make assumptions as to how fast the code itself is executing: having that code run four times faster than expected can cause problems. The four areas in which problems most often occur are: AppleTalk, the SCSI port, hard disk drivers, and sound. If you have hardware or software that involves any of these areas, you should test it out on an accelerated system before investing in one of these boards.
Unlike the Prodigy SE, the HyperCharger accepts standard Apple SIMMs for memory expansion (up to 4MB). Since there is a 4MB limit on the RAM, there's no socket (or need) for a 68851 PMMU chip. There is an expansion port, and the board supports E-Machines' large screen; however, the expansion port is GCC's own 64-pin-plus-12-pin design (see "Difference in Acceleration" for more comments on expansion ports).

The HyperCharger we received did not load the ROM into its fast RAM at first. The result was a general performance penalty of about 30 percent; in other words, the HyperCharger ran at about 70 percent of the Prodigy's speed. However, GCC shipped us an early version of an application that does load the ROM into the fast RAM. Using this application, the HyperCharger's performance was dead-even with the Prodigy's in just about every benchmark and was faster in several. GCC has indicated that a version of this application will be available to HyperCharger owners.

The HyperCharger also has a Control Panel option, which is installed by putting an Init file into your System Folder. This option has the same basic functions as the Prodigy's: turning the 68020 cache on or off; selecting SANE/68881 support; and turning on or off the patch that allows MacWrite 4.5 to run. When selecting SANE/68881 support, you can choose between Apple SANE and GCC SANE, depending on whether you are interested in greater accuracy (Apple) or higher speed (GCC).

The HyperCharger's price is very competitive with the Prodigy SE's: $1499 for the basic system (68020, 1MB RAM); with a 12-MHz 68881 it sells for $1699. The faster 16-MHz version costs $1899. GCC has been shipping the HyperCharger since early May.

Peak Systems' Orion Board

Peak Systems introduced several hard disks and tape backup units for the Macintosh in 1986. Now, Peak Systems is getting into the upgrade act with its Orion board for the SE, and Peak plans to support the Mac Plus and the 512KE with similar accelerator boards. We didn't get to play with a finished Orion board; instead, an engineer showed up in town with a wire-wrap version that sat outside of the Mac SE.

From what we were told, the basic system will be the same as those for the other upgrades: a 16-MHz 68020, 32-bit-wide data path, and a 1MB RAM socket for an optional 68881. And like the Prodigy SE, the Orion will allow RAM expansion up to 32MB and will have a socket for the 68881. Peak Systems is actually removing the Apple ROM and placing it on the Orion board, thus saving some RAM space. In theory, this should result in better performance because the Orion's 68020 can execute ROM routines much faster when they're on the Peak board than when the ROMs are on the motherboard. The initial benchmarks we ran with the wire-wrap version did not reflect that increase in speed, but performance comparisons are not justified until the board is complete.

The price for the basic Orion board will be $1995; the 68881 option is an additional $295. Peak Systems started shipping the Orion board the first of June.

Radius's Accelerator

Radius announced an accelerator board in March, when Apple introduced the Mac SE. We were unable to obtain one for testing, but in a phone conversation with Alain Rossman, vice president of Radius, we gleaned some information about the product.

**Figure 1**
The Whetstone benchmark, a common measure of compiler efficiency and floating-point performance, shows that both the Prodigy SE and the HyperCharger were faster than the Mac II at calculating double-precision floating point values.
Like the other boards, the Accelerator will have a 16-MHz 68020 and a socket for a 68881 coprocessor. Like the Prodigy SE, the 68020 can be disabled and run in 68000 mode. Unlike the other boards we've discussed, the Radius product will offer no on-board RAM expansion possibilities. With 1MB chips, you can expand the motherboard memory on an SE to 4MB, but the data path is still 16 bits wide. According to Rossman, that's not as serious a limitation as it might seem, because of the on-board cache.

The 68020 has its own cache, which holds up to 64 instructions (see "Speed Traps" for a more detailed explanation). The Accelerator has a 32K cache made up of fast static RAM with no wait states. The Accelerator's cache holds both data and instructions—unlike the 68020's cache, which only contains instructions—and is a write-through cache, avoiding some of the common problems with accelerator boards. Also, the 68020 uses its full 32-bit bus for accessing the cache.

Radius claims that the 32K cache results in high performance. In fact, according to Radius, many writes to the video screen end up going through the cache. This means that the processor writes a full 32 bits to the cache; the hardware on the board itself then copies the data from the cache to the video RAM.

The Accelerator also has firmware that can intercept all SANE calls and automatically transfer them directly to the 68881 (or the 68882 when it is available).

The Accelerator has an expansion bus called the Magic Bus. It's a full 96-pin connector that doesn't use a cable. Not surprisingly, the Radius Full Page Display plugs in and works just fine. Radius plans to make the pin-out public so that other manufacturers can adapt their hardware to it.

Most significant, perhaps, is the price: $995 for the basic board, $395 for the 68881 chip. This allows you to get a souped-up Mac SE for the lowest possible investment. Radius says that they will start shipping the Accelerator by the first of July, so it should be out by the time you read this.

### Off to the Races

We ran a series of benchmarks to measure the relative performance of the different systems. The difficulty, of course, was in coming up with some universal

---

**Figure 2**

The Dhrystone benchmark, a test consisting of a balanced mix of CPU instructions, also shows that the Prodigy SE and HyperCharger outperform the Mac II.

**Figure 3**

The FP operation benchmark pits the accelerators against the Mac II on a series of addition, subtraction, multiplication, division, sine, and tangent calculations. Both accelerator cards edge out the Mac II.

**Figure 4**

The Sieve of Eratosthenes, a widely quoted benchmark, runs so fast on 68020-based machines that the resulting differences are too small to be meaningful.
Difference in Acceleration

One area in which accelerator cards differ is the implementation of the numeric calculation routines called the Standard Apple Numerics Environment, or SANE. Levco routes all SANE calls through its own SANE software to the 68881 chip. The Levco SANE package (like the GCC SANE package) routes more floating-point calculations to the numeric chip than the Apple SANE package does; this gives you maximum performance.

But if you are interested in maximum precision, Apple's SANE software is recommended, because it overrides the 68881 coprocessor for calculations when the 68881 is not accurate enough. Additionally, in cases where exact Macintosh II compatibility is necessary and in very high-precision calculations, an option to use the Apple SANE package is very handy. From the information available at this moment, only the GCC HyperCharger 020 supports Apple SANE as an option.

A second important difference between accelerator cards relates to RAM compatibility. Even though the 68020 on the accelerator card has a data path 32 bits wide, the 68020 can only access the RAM on the SE motherboard via a 16-bit data path, slowing down overall operations. Because of this, Levco, GCC, and Peak all recommend setting a 1MB cache via the Control Panel, so that the motherboard RAM is used for the cache and all application programs are loaded into fast (32-bit path) RAM on the accelerator board.

However, if Apple comes out with SE machines that have 2MB or 4MB of RAM on the motherboard, you'll want to remove those SIMMs and install them on the accelerator board. The HyperCharger 020 and the Orion use Apple SIMM on the accelerator board, so you can easily do this. The Prodigy, on the other hand, uses ZIP RAM, which only interchanges with other ZIP RAM from Levco. In that case you could set the cache to 2MB or 4MB to increase performance; however, very few programs would be able to take advantage of a cache that large.

Radius takes another approach to using the motherboard memory. The Accelerator's high-speed 32K cache memory can use whatever memory is available on the motherboard. Depending on the percent of instructions running from the cache, the Accelerator's performance could compare favorably to that of other boards. However, the Accelerator was not available for testing as we wrote this article.

A third difference is in the way the cards allow for additional expansion. The Mac SE provides only one slot, a 96-pin connector that the accelerator board plugs into. What if you want to connect another peripheral, like a large-screen monitor? All the cards discussed in this article do have one type of expansion slot or another.

Peak and Radius pass the SE's original 96 signals to an expansion connector, so you plug other SE boards into these cards. Levco provides an adapter for its 125-pin connector, which makes the SE's standard 96-pin connector available. Taking another route, GCC passes out its own expansion connection, which contains 64 signals from the 68000 plus 12 signals from the 68020. GCC is aggressively soliciting third-party developers to support this connector.

As we have not tested any of these connectors, we cannot comment on the feasibility of installing additional cards either inside or outside the Mac SE. However, this does bring up the issue of expansion-connector standards. Until the manufacturers agree on one connector standard, you won't be able to add the same expansion boards to all the accelerator cards.

Three of the four accelerator-card manufacturers have announced large-screen displays that work with their boards: the MegaScreen II from MicroGraphic Images works with Levco's Prodigy SE, the Big Picture from E-Machines works with GCC's HyperCharger 020, and the Radius Full Page Display works with Radius's Accelerator.
benchmarks and running them on all systems. The accelerator cards were run with the 68020 cache turned on, the SANE-to-68881 mapping on, the MacWrite patch off, and the 1MB disk cache (Apple's standard cache in Control Panel) on, to avoid locating the program in "slow" memory.

For the Mac Plus and SE comparison, the benchmarks were written in Consulair MacC version 4.53, which produced standard 68000 code and SANE calls.

For the accelerator cards and the Mac II we used a special version of Consulair G, version 5.04, which produces 68020 code and direct calls to the 68881 chip (instead of to SANE).

Even with regular SANE calls, the accelerator boards equipped with 68881 chips were over ten times faster than the regular Mac SE for benchmarks with intensive floating-point use (Whetsone and FP). The HyperCharger was as fast as, or faster than, the Prodigy SE in most benchmarks. With the direct calls to the 68881, the floating-point benchmarks take another dramatic leap; both the Prodigy SE and the HyperCharger now run from 80 to 130 times faster. Again, the HyperCharger has a general edge over the Prodigy SE; both clearly outpace the prototype Orion and even the Macintosh II. That last bit of news shouldn't be a complete surprise; though the Mac II also runs at 16 MHz, it requires two wait states for the 68851 address translation (as opposed to one wait state for the accelerator boards), so you would expect it to run most benchmarks more slowly.

To compare graphics speed we ran the same program, written in Turbo Pascal, on all five machines. In addition, we ran that program on the HyperCharger with the ROM-copying application turned off. You can see what a tremendous difference it makes to load the ROM into the fast RAM; without doing that, graphics performance is not much better than with a regular Macintosh SE.

Applications

We also ran a long list of application benchmarks on the Prodigy SE and the HyperCharger. The results once again showed the Prodigy SE and the HyperCharger very close to each other. This time it was the Prodigy SE that had the slight edge in most benchmarks, although the differences in speed were typically less than 5 percent.

No major incompatibility surfaced during the applications testing; however, the boards won't run all existing Mac software. And, of course, the increase in performance was wonderful. The ability to turn off the 68020 cache and the special patches that handle MacWrite give these systems greater Macintosh software compatibility than the Mac II. The hardest thing about using these machines was going back afterwards to a regular Mac SE (or a Mac Plus).

At the Finish Line

The only two boards that we can really compare are the Levco Prodigy SE and the GCC HyperCharger, since those were the only two we could evaluate at any extent. Performance was a toss-up: slightly faster on the HyperCharger for some benchmarks, slightly faster on the Prodigy SE for others. But in almost every case, the outcome was too close for the difference to be significant. Levco has been at this a little longer, and it shows in the additional features and options. The Levco and GCC accelerators cost about the same.

One possible issue for consideration: service. Levco will service their own products, whereas GCC refers all service to your local dealer. Levco offers a 90-day warranty that covers all parts and labor; after that, the standard charge is on the order of $40 per hour. In any case, you need to pay shipping. GCC offers a one-year warranty on the HyperCharger, and you can buy extended service through HyperCare from GCC.

Price, as always, is a consideration; if it weren't, you'd probably be buying a Mac II instead of reading this article. For comparison, we'll assume the following system: a 16-MHz 68020 with a 68881 coprocessor, 2MB of RAM, one 800K drive, a 20MB hard disk, a monochrome display, and the (new) Macintosh keyboard connected to the Apple Desktop Bus. "Accelerators Compared" shows how these systems stack up. The bottom line: unless portability and desk space are pressing issues, you're better off buying a Macintosh II than buying a Mac SE and one of these cards. The Mac II gives you a large screen, color, and much greater future expansion. If, on the other hand, you already own a Mac SE, or travel with your Mac, then buying one of these boards is (obviously) far cheaper than going out and buying a Mac II. But regardless of which route you take, be forewarned: once you've used a supercharged Mac, it's hard to go back to the Mac of old.
Mastering Mail Merge

Learn about software and techniques that can help you handle mailing lists

by Charles Seiter

Soon or later, from economic necessity or merely the perverse desire to clog up a few mailboxes, you'll want to mail out documents to the many names on your mailing list. So that you don't have to type the same letter or report over and over again, embellishing here and there for the personal touch, you'll want to merge the document with the mailing list. A merge simply puts the right information from the list into the document at selected places, giving you a whole set of customized documents automatically.

Even experienced users of word processors can find form letters and mailing labels confusing. It's possible, with a little inattention, to have your printer spewing hundreds of incorrectly formatted letters in a mad Sorcerer's Apprentice-style catastrophe.

But don't worry—it's nothing you can't master in a half hour. The basic steps of mail merge are easy to follow if you use a simple example as your guide. And many software companies are eager to help you; they offer specialized programs with easier and more powerful mail merge functions than word processors have.

What follows is a roundup of mail merge software. I'll tell you what to look for in a mail merge program, and compare the capabilities of some representative programs that I've selected for their convenience and flexibility. Since most mailing-list management software is geared toward working with Microsoft Word, I'll also illustrate the use of the Print Merge option in Word 3.0's File menu (see "Getting Out the Word"). The merge function in Word really works best at an intermediate level of use—if you only use it a few times a year, you'll be stuck doing some scrambling in the manual, whereas if you merge a variety of documents every day, it falls a little short on convenience and power.

What to Look For

There's a ready market for two types of mail merge products: very easy office software that makes merging nearly automatic, and high-end software designed for large database use or professional offices.

Here's a checklist to help you find software to make merging simple and efficient:

- **Word Compatibility** A good heavy-duty mailing-list manager can create data files that work with documents in Word. This feature can be crucial if you want to share list data or tasks with other offices.
- **List Import** You probably have a mailing list around the office. Make sure the product you choose can use your list. Mailing list professionals figure that it costs 20 to 30 cents to enter a name and address in a standard list—that means that for lists of 500 to 1000 names, entry costs can outweigh the cost of the software. Microsoft products easily convert name lists developed in Lotus's 1-2-3 on the IBM PC.
- **List Handling** Some merge applications call for lists that are stable for a year or more, while other applications have "hot" lists that are edited every week. Consider whether you want to manage and link lots of separate short lists, or whether simple addition or deletion of one item at a time is all you'll need.
- **Cost Control** Some software, such as Bulk Miler from Satori, can search lists for duplicates: J. Miller and John Miller with the same address. Bulk Miler will also sort list entries to take advantage of lower postal rates for presorted mail. Any competent database (like Forethought's FileMaker Plus, for instance) will do these sorts, but in Bulk Miler they're built in.
- **Ease of Learning** If you know your way around Mac software, you won't have much trouble with a database-plus-wordprocessor combination for mailing list work. But if you're a first-time computer user in a professional sales office, a program like Software Complement's ClientMac, with ready-made screens for every probable use, will likely be a happier solution.
- **Hardware** In the future, of course, we'll all have removable 200-meg hard disks that cost 12 cents and fit in a matchbox. In the meantime, there are plenty of organizations with small budgets whose last big upgrade was the 400K external drive. The packages reviewed here differ greatly in hardware appetite—check the summary table to make sure the program you want will fit your hardware or warrant an extra investment.
Executive Office

If you have read "Getting Out the Word" and still aren't sure which line is the header in a data document, then look into Executive Office from DataPak Software. Each aspect of this program, which covers word processing, database management, and spreadsheet calculation, has limitations compared to the ultimate power product in each category. But Executive Office has a special strength of its own: all operations mimic what you would do if you were working with paper files. The program's metaphor, in which you shuffle little folders around an office from file cabinet to copier to stockroom, is enough to make an Excel-macro maven snort in disgust, but it has lots of charm in practice and surprising flexibility. A folder for a given name can contain calculations, forms, data tables, and drawings, and all these are very easily merged into an associated letter. Figure 1 offers a view of the mail merge function's starting screen in Executive Office. This program won't let you fail. And, there is also a simple provision for mailing labels: you pick the label you want from the "stockroom" and tell the program where to find the names.

Microsoft Works

Microsoft Works takes a more mainstream approach, integrating the standard word processing, database, and spreadsheet functions, but providing more hand-holding than Microsoft's power programs for those tasks. To prepare a merge document you simply type in the text, stop at the point where you want a merge field, and select Prepare to Merge from the Edit menu. Works then prompts you for the field by listing the available Works databases (you will have entered your name list in a database) and associated lists of fields. If you insist, you can export database files to Word as data documents for merging with Word letters.

To inspect your work, choose Show Field Data from the Edit menu and you will see the first record merged into the appropriate places in the text. This is the simplest
Getting Out the Word

The best way to understand how mail merge works is to look at a simple merge operation done with the ubiquitous Word 3.0. On one side you have your document, with some spaces tagged to receive information. On the other side, you have the information in a list. For a successful merge you simply show Word where to find what by specifying both the list you will use and the items within it.

Let's look at "Between Letter and List" to see the mail merge in operation. First, notice that the list (or Data Document in Word jargon) has a special first line called the header. The header names the categories of information on each line in the list. The field names, name (tab) state (tab) product, match up with the information on the first "real" line, Bob (tab) Wisconsin (tab) cheese.

Next, notice that the first line of the letter (DATA my list) names the list you want it to use. The letter also contains tags (name, and so forth) that match the field names in the header of "my list." The tags are placeholders that indicate the type of information the program should look up and the information's position in the document.

Thus, when you call for Print Merge on the document "my letter," Word knows that "my list" has the information to merge because of the first line, DATA my list. It will look through that file for each set of fields (name, state, product in our example), generating one document at a time.

You can preview the results of the merge operation by selecting Print Merge from the File menu and then choosing New Document in the Print Merge dialog box. New Document stacks all your merged letters in a window called Form Letters so that you can review them and make little personalizing changes if you like (see "Between Letter and List"). The double line near the bottom of each letter stands for a page break—all you need to do is select Print in the File menu and you will have a stack of properly separated letters.

If you have another file full of names, called "my file," for instance, you could generate form letters with that file simply by using DATA my file as the first line of the document. So there are only three key elements to keep in mind when you perform a merge: the letter containing field name tags, the Data Document containing all the fields, and the Data line (the first line in the form letter) connecting the two.

The example in the figure still leaves us with two questions. How do you write the letter? And how do you set up the data document? Let's consider these questions and a few other points step by step.

- **Size of List** First, decide whether you have more time invested in your letter or in your mailing list. If you have a 1000-name list in a particular format, you should learn to be happy with the fields in that list. If you have a 30-page business plan and are making up your mailing list from scratch, you might as well pick any fields you like and then make up a list to match.

- **Document Preparation** The easiest way to create a foolproof letter for merging is to create a first draft with real names in place (Mr. David Goliath, for example) and then replace the fields one at a time. That is, search for Mr. and replace it with title, search for David and replace it with first. With this method you won't inadvertently end up with double blanks or other punctuation slips in the address. Please note also that « and » are the special...
characters Option-
 and Shift-Option-
, not the little arrows over the comma and period on your keyboard. This tiny point is a frequent cause of frustration for newcomers to merging.

**A List in Word** If you haven’t prepared a mailing list in some form of database, you need to make a document like “my list.” Using Word, you can start typing in a first line of field names (the header), making sure that you separate the fields with tabs (turn on the Show ¶ option in the Edit menu so you can see the little arrows in place). Then type in each line of data, again separating the fields with tabs, and ending each line with a Return (make sure there’s a paragraph mark at the end of each line). When you’re done, give the document a suitably evocative name so you know it’s a data file.

**Lists from File** If you have a database of names in Microsoft File that you want to merge, simply save it as text (with a different name to remind you that it will be used in a merge). Open it in Word, once more with Show ¶ on, and check the fields available for merging in the header.

**Lists from Excel** If you have a list in Excel, just save it as text, again giving it a special name. When you open it in Word, however, you may find that the first line is just a data line—File requires that you set up fields before entering data, but Excel doesn’t. In this case, you must take a look at the information in the first line and insert a first line that defines the field names. It’s slightly easier to make up a header line in Excel itself than in Word, so you may want to reopen the original Excel file and insert a new first row.

**Remember the Header** Most database programs will save files with text, showing tab-separated fields when the saved text file is opened in Word. As in Excel, you may want to set up the header line in the program itself for convenience, but it’s no great problem to tack on a header in Word.

**Preview** When you select New Document from the Print Merge dialog box, you get to preview the merged letters. This, however, creates a new document—if you have a 1000-name mailing list for a 5-page letter, you have just created a 5000-page document. You should thus probably consider merging just a few letters under New Document for inspection (there’s a From: To: choice). If you’re working with a limited amount of memory and a long document, and you can only preview the first merged record, it still helps to make sure that all details are correct before you chew through half a forest in paper. Word is unforgiving about merge formats, and typos can cause major snags.

**Fine Points** Although a discussion of all Word’s ingenious possibilities on this theme is beyond the scope of this article, you should know that it’s possible to write little pieces of “program” into a letter to let Word make decisions during a merge. For example, you can insert IF...THEN statements in a letter so it prints one message for names A through L and another for names M through Z. Typically, you would use IF statements when you have a highly developed data file that contains fields specially set up for sorting and tagging names (see the Word reference manual for details).

**Mailing Labels** Labels are treated in Word just as any other merge document—in fact, the label document is typically no more than the address part of your form letter. All you have to do is print perfect three-across labels on a standard 8½-by-11 label sheet in tinker with the output format. Choose Show Ruler from the Format menu and move the left indent to the right a bit so that the labels don’t print right to the edge. Under Page Setup (in the File Menu) set 1 inch as the height, set a top margin of 0.1 inch, and set all other margins at 0 inch. From the Format menu, choose Section, set 3 for Columns Number, and select New Column for Section Start. This is a little more cumbersome than the label-making routines in standardized mailing list programs, but it will work without much fuss. Again, try printing just a few until you’re happy with their appearance.

That’s it. Now you’re armed with a little bit of dangerous knowledge—dangerous to anyone with a mailing address, anyway. But at least you can get that mailing out without rewriting the same basic letter over and over. That’s a fate that should be reserved for after-school blackboards.
merge scheme that retains easy upward compatibility with other Microsoft products. Mailing label production proceeds, as in Word, through the Page Setup choice under File, but only allows one-across labels (Works may do windows, but it won't do columns). To remedy this limitation, Heizer Software offers a special Works mailing label template that accommodates any label layout you are likely to need.

**Bulk Mailer**

Some programs, such as Works, concentrate on document production and do mailing labels as a sideline. But mailing lists and labels are **Bulk Mailer**'s bread and butter. If you really want hassle-free labels for long lists, Sator's **Bulk Mailer** is the program for you. The first screen you see is a customizable mailing label and a set of command buttons for scrolling through your list. Lists can be linked, merged, and sorted by any field, including CAR-RT and various forms of zip code separation for postal money-saving. **Bulk Mailer** lets you review a mailing list for duplicates at user-specified levels of matching, holding suspected duplicates in a file for your inspection (see Figure 2). This product is clearly not intended for your personal Christmas card list, but in heavy office use it would pay for itself in days.

**Bulk Mailer** is not a word processor, so it uses a simple command (Send to Disk) to generate a file that can be used as a data document in **Word**. The document printed by Save contains **Bulk Mailer**'s field titles as the header line, so you will need to check that these are the field names you are using in your **Word** text.

**FileMaker Plus**

**FileMaker Plus**, from Forethought, is a professional database with a new series of templates that automates most of the functions in list development and form-letter mailing. The Mail List Management template lets you call up names from a **FileMaker Plus** database and print labels according to many preset formats, specified right down to their Avery stock numbers. A related template, designed specifically for organization membership lists, manages extra data fields (work and home phones, payments, and other reference) and includes a Postcard template for billing dues. **FileMaker Plus** provides facilities for generating a form letter. In this case it really is a form rather than a plain text document, using a blank form layout with provisions for inserting fields anywhere on a page. Mailing list files can also be exported to **Word**, producing the familiar tab-separates fields with a first-line header as a data document. There are advantages to using a full-featured database for merge work—the facilities for sorting, rearranging fields, and picking out subset lists are well-designed—but **FileMaker Plus** also excels at producing structured documents, not just text files, for merging.

**Client/Mac**

**Client/Mac**, a program from Software Complement, is a special mailing list manager geared to sales and consulting operations. Its standard mailing list record provides entry spaces for tracking follow-up on sales leads. It also has a multiuser format that can coordinate follow-up records for a group of salespeople, and it will keep track of time spent on projects for particular clients, too. Because some business correspondence requires more than a standard form, **Client/Mac**'s Letters menu provides a set of ten user-defined form letters for use with client lists. **Client/Mac** also exports client lists to **Word** as data documents for merging. The program generates one-across mailing labels with a single command and prints Rolodex cards, UPS forms, and shipping labels just as easily.

Software Complement has designed a system that neatly anticipates a great many business needs. It runs under **Omnis 3**, so you need either **Omnis 3** or its run-time system. One problem with **Client/Mac** is that it searches and processes files more slowly than, say, the database section of **Works**. A hard disk drive ameliorates the speed problem somewhat, but the program is still comparatively slow. For small-to-medium client databases that require detailed attention (as opposed to a once-a-year, 10,000-name membership drive), **Client/Mac** has the right stuff.

**Market Master**

For a little more money, you get a little more program. **Market Master**, a Felix-based program from Breakthrough Productions, is a full-fledged activity manager arranged around a sophisticated mailing list organizer (see Figure 3). Like **Client/Mac** it is easy to use, but it is specifically oriented toward sales.

**Market Master**'s sales support is truly comprehensive—one trembles at the thought of this program in the wrong hands. It provides automatic tracking and updating of leads, a stackable, searchable phone notepad for sales calls, date-driven...
reminder notes for future calls, sets of form letters customizable within a huge matrix of output shapes and sizes, and facilities for sorting and printing lists of customers and clients by any criterion. If you can’t improve your sales with this program, consider taking up carpentry.

Like Client/Mac, Market Master is slow on searches of large lists of names, but for medium-size lists (50 to 300 names) its performance is quite acceptable.

Excellent Exchange

Heizer Software has an effective set of products—cataloged under the title Excellent Exchange—for people with large name-list files in Excel. The mail-merge template system lets simple form letters access Excel files directly. (Yes, you could export the Excel files as data documents to Word, but you may not have Word or may not want to learn it.) The mailing label template allows you to define and print mailing labels of any size (up to 256 across, if you have a 60-foot-wide printer) using your Excel name lists.

Heizer’s templates offer several advantages to Excel users with moderate mailing list chores. First, they’re cheap—at $15 each for the merge and label template sets, there isn’t much risk involved. Second, Excel’s links to the IBM PC world are better than those of the other merge products described here. You can translate a name list from 1-2-3 into Excel rapidly and automatically, without worrying about header lines or tabs, and you can ship an error-free form letter directly from Excel. Third, Excel lets you sort subsets on any combination of fields before merging (and adding a new field simply means inserting a new column), so you can generate specialized lists from your original set of names. The merging function is not as fast as a plain merge in Word from a data document, but for occasional use or for work that involves fancy sorting, the templates offer a quick and clean solution to everyday form-letter problems.

The Last Word

At the center of the Macintosh form-letter universe is Microsoft Word 3.0, to which all documents flow. But many programs, even the ones that ultimately pass text files to Word for merging, provide special facilities to smooth the preparation of custom documents that are based on mailing lists of varying levels of complexity. And with the streams of mailing labels that can be generated from the programs described here, neither snow, nor rain, nor heat, nor gloom of night can stay your Mac from the swift completion of its postal rounds.

Figure 3

Information in Market Master’s client records can be merged into form letters, sorted into daily activity files, and used to make follow-up files. Breakthrough Productions has composed an exceptionally zany set of demo files—the example shown here is the only tame one.

As president of MicroServe, Matt Cobb runs a marketing services business that provides newsletters, flyers, brochures, and other published materials. MicroServe handles direct mail promotions for clients and maintains mailing lists with FileMaker Plus and Microsoft Word.

See Where to Buy for product details.
Desktop Design

Lightspeed's Color Page Layout System brings graphic designers out of the Dark Ages

by Erfert Nielsen
Graphic designers at all but the biggest studios, agencies, or publications currently design color materials in black and white. Cutting, pasting, and resizing photocopies or photostats, they lay out pages, posters, or ads and then choose colors for the various elements from a book of standard shades. These designers don’t see how their creations will actually look until they see the four-color film proof or the finished product. At that point, changes—if deadlines allow them—cost money and hold up the production process.

Now a page-design system that runs on the Mac II enables designers to create and revise layouts in 256 on-screen colors. The Color Page Layout System (CPLS) from Boston-based Lightspeed is a turnkey system that comprises the hardware and software necessary to transfer hard-copy artwork to the Mac’s screen and manipulate the elements of a design. The standard system, which sells for around $30,000, consists of a Mac II with 2 megabytes of RAM and a 40MB internal hard disk, Lightspeed’s page-design software, Apple’s 640- by 480-pixel by 8-bit frame buffer card, an Apple 13-inch color monitor, and a 300-dots-per-inch Howtek color scanner. If a designer wishes to print proofs, a color thermal primer can be added to the system for an additional $10,000. Future versions of the system will also work with film recorders.

Needless to say, this price range makes professional design studios, rather than individuals, the target market for CPLS. The system can be used for advertisements, package design, brochures, charts, and other applications using color graphics.

**Design Elements In, Layout Out**

Entering and editing artwork on CPLS is simple. The graphic designer uses the color scanner to transfer a piece of artwork—a photo or illustration—to the CPLS program, where it’s stored in a file for later use. The designer then opens a new file, in the form of a blank page, and pastes, crops, and positions the graphic elements. Headlines or other elements of display type can be entered from the keyboard; like graphics, text can be resized and moved about the page. If the project includes body copy, CPLS fills selected areas with dummy type. The designer can experiment with the typeface, size, style, and even color.

The Color Page Layout System doesn’t fit into current Mac application software categories. It’s not a color paint program; while you can create and fill regular and irregular shapes, you can’t edit scanned pictures pixel-by-pixel or draw original artwork. Neither is CPLS a desktop publishing system. Mac owners are accustomed to laying out pages of text and illustrations on the Mac and printing a camera-ready hard copy on the LaserWriter or a Linotronic typesetter. While CPLS can produce what’s known in the design field as a comprehensive, or comp (a close approximation of a finished design), in most cases the final design will have to be produced by traditional printing methods. (An image scanned at the Howtek’s 300-dpi resolution might be suitable for a newspaper, but would not be appropriate for a higher-quality job.)

Although the Color Page Layout System focuses on design rather than production, it can send layout information to a prepress system to facilitate the production of the final four-color film. This layout information includes specifications for page size, the size and placement of graphics, the shape and color of graphic elements produced on the Lightspeed system, and display type. (Even in the minicomputer world, design systems don’t produce production-quality output. The systems that can work with the very-high-resolution files required for producing four-color film are called prepress systems, or production systems. These workstations are electronic stripping facilities where high-resolution text and graphics—accessed from disk or input with a high-quality scanner—are assembled into electronic pages. The layout file produced by CPLS does not contain as much information as files produced by high-end systems, but it can make the electronic stripping process easier.)

Apart from a limited interface to a prepress system, what are the advantages of the Color Page Layout System? Perhaps the most important benefit of CPLS is its ability to closely approximate the look of a finished design, freeing the graphic designer from relying on crude sketches to convey an idea to a client. In addition, the system lets designers easily manipulate the elements of a design. Text and graphics can be ar-
Of Color and Money

Thirty thousand dollars may sound like a lot to Macintosh owners, but it's a basement bargain in the world of color design. Minicomputer-based color design systems like the Scitex Vista III, the Crossfield ProEdit Visualizer, or Lightspeed's own Sun-based Design System 20 range in price from $100,000 to more than $350,000. Like the Color Page Layout System, these workstations usually include a scanner for inputting color graphics, a computer with a graphics frame buffer, and a high-resolution monitor. A variety of optional devices, such as thermal printers or film recorders, provide less-than-publication-quality output.

But while the Lightspeed system is a breakthrough PC product in some ways, it's not going to turn high-end systems into dinosaurs just yet. In general, high-end systems offer more features, more peripheral options, and a tighter tie-in to production systems. For example, because they work with millions of on-screen colors (compared to CPLS's 256) and operate at resolutions up to 1024 lines per inch, high-end design systems can offer more advanced color painting features, including photo retouching capabilities.

It's likely that in a few years Mac II design systems will perform up to the level of current minicomputer systems. But, as Tyler Peppel of Lightspeed notes, that still doesn't mean the Mac II will eliminate the minis' usefulness: "By the time the Mac can do what our Sun system does now," Peppel predicts, "the mini will be even farther up the road to true pre-press capabilities."

Hands-On Experience

Macworld looked at a preliminary version of the Color Page Layout System (the name "Color Page Layout System" is also preliminary and may change by the time the final product is released). Although the software was several months from completion, it functioned well enough for us to give the system a test run. Our system consisted of a Mac II, a SuperMac 19-inch color monitor with a resolution of 1024 by 768 pixels, a 300-dpi Howtek Scanmaster color scanner, and a 200-dpi Seiko D-Scan color thermal printer.

Macworld senior design associate Leslie Barton put CPLS through its paces, creating the opening-spread layouts shown in Figure 1. She was able to use the system after about two hours of training—a tribute to the software's ease of use, especially since no documentation was available. The CPLS application has a user interface that will be familiar to those who have used other Mac graphics programs, such as MacPaint or MacDraw.

A typical page-design session went something like this. Barton entered two pictures (in this case photos) with the Howtek scanner. Since she didn't need the images in their entirety, she made several croppings, named each, and saved them in a folder called Images. She could then copy her selections to the Clipboard and paste them onto a page. She used the selection arrow to size the photos and position them on the page. On-screen rulers and an adjustable snap-to grid helped align various pieces of the design.

Next, Barton typed a headline with the display type tool. She set text size by simply drawing a box of the appropriate height; to fine-tune her selection, she typed specifications into a dialog box. (The version of CPLS we previewed had only bit-mapped fonts, but a Lightspeed representative informed us that the final version will use outline fonts from Bitstream; like LaserWriter fonts, Bitstream fonts can be proportionally resized.)

Barton then chose a column width for the article's body copy and filled the columns with dummy text. She used the display type tool to create a large drop cap for the beginning of the article. Next, she wanted the color of the drop cap to match one of the colors in...
With the Color Page Layout System, alternative layouts can be compared on screen, complete with photos, illustrations, and text. The system allows you to open several windows simultaneously to view layouts side by side. (Note: If the chess-piece artwork looks jagged to you, it's because it was scanned from a computer-generated graphic; scanned images normally have crisp, well-defined edges.)

the photograph. No problem: CPLS allowed her to set the letter’s color by simply selecting the letter and then clicking on a portion of the scanned image. This color-matching technique can be applied to graphic elements or background page color as well as to text. In addition to picking up a color from an illustration, designers can either choose from a preset palette of 256 colors or mix their own palettes.

**Speed and Flexibility**

Our designer spent several hours experimenting with various page layouts, type specifications, and color combinations. She ended up with three proposed layouts, which she printed out with the Seiko thermal printer, ready to be critiqued by a client or supervisor. CPLS also lets designers compare the merits of different layout options on the screen; several pages or spreads can be opened at once for direct comparisons.

On the whole, Barton was favorably impressed with the system, though she doesn’t think it would necessarily be worth the investment for the purpose of article design, her main job at *Macworld*: "I didn’t feel the sizing and other layout abilities saved me that much time," she said. "The great thing about the system is the speed with which you can try out different color combinations. I think it’s best suited to applications where color is a major consideration—as with posters or covers."

A potential problem surfaced when Barton printed her results on the thermal printer. The printed colors didn’t closely match the colors displayed on the screen. Lightspeed says the color correspondence will be better when the software is completed, but there will always be some discrepancy between the colors on the screen and those on thermal-printer output.

Many designers won’t need to rely on printed proofs, however. Lightspeed's Rapport remote-viewing system allows designers to send color page layouts by modem from one computer to another. (Rapport currently operates with an IBM PC or compatible, but Lightspeed plans to offer it on the Mac-based system as well.) Rapport not only sends files from one location to another, but also allows the person on the receiving end to scrawl notes on the design with a light pen and return the annotated image to the designer for revisions. If a design studio and a client are in different cities, Rapport can shave days off the approval cycle. A standard Rapport system, which includes a PC AT compatible, a 40MB hard disk, a modem, a high-resolution graphics card, a 19-inch color monitor, a digitizing tablet and stylus, and communications and graphics software, runs about $30,000.

Lightspeed’s Color Page Layout System is a promising product for professional graphic designers. While $30,000 may seem expensive, keep in mind that CPLS, especially when combined with the Rapport communications system, can save designers a good deal of time, effort, and money in the long run. For many graphic design studios, the ability to work directly in color will be well worth the price.

See *Where to Buy* for product details.

---

**Figure 1**

With the Color Page Layout System, alternative layouts can be compared on screen, complete with photos, illustrations, and text. The system allows you to open several windows simultaneously to view layouts side by side. (Note: If the chess-piece artwork looks jagged to you, it's because it was scanned from a computer-generated graphic; scanned images normally have crisp, well-defined edges.)
Reviews

The Original Gets Better

PageMaker 2.0

Desktop publishing program. Pros: Faster printing than version 1.2; dictionary-based hyphenation; improved importing and new exporting features; support for EPS and TIFF files; hypertext help system. Cons: Cannot wrap text around graphics; cannot place long documents with one command; does not group multiple items. List price: $75 for 2.0 update; $195 for complete package. Requires: Mac Plus, Mac II, or Mac SE plus a hard disk. Copy protection: None.

Although ReadySetGo and XPress still maintain a measure of superiority over PageMaker in certain areas, Aldus's version 2.0 is a completely rewritten update that includes dozens of new features. Foremost among the improvements are the new typographic functions (kerning, hyphenation, extensive character and paragraph formatting) and the new importing and exporting capabilities.

Typographic Features

PageMaker 2.0 allows both automatic and manual kerning (the process of adjusting the space between characters). The automatic function kerns given pairs as you place or type text. However, it is available only for PostScript fonts that have been designed with specific character kern-pairs. For other pairs (and for fonts which do not provide kern-pairs), you can manually adjust the spacing between any two characters in increments 1/24 the characters' point size. In addition, a 110,000-word dictionary automatically hyphenates as you type, edit, or place text.

A number of new paragraph format options have been added that bear a strong resemblance to their counterparts in Microsoft Word: left indent, right indent, first-line indent, and space before and after each paragraph.

Tabs have also been somewhat improved, with the addition of various leader options. However, the tab-ruler window is still difficult to deal with, since the ruler is not aligned with the text block. Also, since the text does not reformat until you click OK, it may take several attempts to format it correctly.

PageMaker 2.0 is missing both a Show Paragraphs command, which would display paragraph and tab characters within the text, and the ability to transfer formats between paragraphs. On the other hand, the new version can now mark a selection of text one word or one paragraph at a time and select all or part of a story, no matter how many text blocks it spans.

You can manipulate text blocks much more easily in version 2.0. You can resize an existing one by clicking on and dragging one of its corner handles. You can also size a placed or newly typed text block by simply holding down the mouse button and dragging to indicate the desired size while placing, or before beginning to type. PageMaker's text-importing function has been dramatically improved. The program can now read formatted documents from Microsoft Word 3.0 and T/Maker's WriteNow, as well as from PC-based programs and formats such as WordPerfect, WordStar, XyWrite III, and DCA.

Another new feature in PageMaker 2.0 is the ability to export stories back into word processing documents. This is useful when you have edited a story in PageMaker, rather than making the change in the original document and then repeating the placing process. The exported document can be stored as text-only or as a Microsoft Word 3.0 file.

Graphics

Several new graphic formats are now supported by PageMaker, including EPS (Encapsulated PostScript), which is used to place graphics created with sophisticated drawing programs like Adobe's Illustrator.

Facing Pages and Drag-Placing

With PageMaker 2.0 you can edit your publication while displaying facing pages. Here you also see a story on the second page being drag-placed— that is, its images are defined as it is placed by dragging the loaded text icon.
Although Cricket Draw can produce EPS files too, PageMaker 2.0 will not accept them. (It will, however, allow you to place Cricket Draw files saved in the PICT format.) Version 2.0 also supports TIFF (Tagged-Image File Format), used for transferring scanned images with accurately reproduced shades of gray.

**Printing and Performance**

Printing is much faster with version 2.0. Documents with several downloadable fonts and a few paint-type graphics could sometimes take up to a half hour to print on a LaserWriter with version 1.2. With 2.0, the same complex documents are printed in less than five minutes.

PageMaker now lets you choose between Aldus's printer driver and Apple's. While the Aldus driver provides numerous advantages, such as faster printing and support of several special PageMaker features, it also has some shortcomings. For example, the documentation mentions that smoothed polygons—and PICT graphics in general—may not print well with the Aldus driver, and suggests that you use the Apple driver if you have problems.

PageMaker 2.0 can place crop marks around each page, making it easy to trim the paper to the proper size for duplication. You can also collate multiple copies of a document, as well as print pages in reverse order so that they'll be in the correct sequence on the output tray. Finally, you can print page proofs that contain text and PageMaker graphics, such as rules and boxes. (Instead of placed graphics you see a box with a big X where each graphic would be.)

PageMaker 2.0 generally performs better than version 1.2. For instance, the new version saves documents much faster. Also, the program no longer needs to refresh the publication window after you call up some of the dialog boxes—the window reappears instantly. (When the window does need to be redrawn, however—such as when you call up a desk accessory window—it's not much faster than the older version.)

The maximum size of a publication has been expanded to 128 pages, up from a 16-page limit in version 1.2. And another new feature allows you to rotate through layers when selecting items by simply holding down the Command key as you click the mouse button.

**So What's Missing?**

Despite PageMaker's useful additions and enhancements, other products still are more capable in several areas.

One shortcoming is that PageMaker does not automatically wrap text around a graphic image, as do XPress and ReadySetGo. Also, it would be useful to have a simple way of specifying a large initial capital letter for a paragraph, as there is in Ventura Publisher on the PC.

Both XPress and ReadySetGo 3.0 can automatically flow an entire story with one click of the mouse button. To place a long story in PageMaker, you must click the bot-
OfficeTalk E-Mail

**OfficeTalk 4.0**

Electronic mail and Linotronic output service. **Pros:** Easy to send and receive messages and documents; includes library of clip art and tips from Aldus and Microsoft; offers optional private libraries. **Cons:** Has far fewer subscribers than MCI Mail; has few general-interest areas; is relatively expensive. **List price:** $50 per address. **Requires:** 512K. **Copy protection:** None.

See Where to Buy for product details.

**Simple Sign-on**

Unlike most information services, OfficeTalk lets you simply type your password and click a Connect button to sign on. The OfficeTalk software signs in and displays the network's desktop. Using OfficeTalk's menu commands, you can exchange memos written with OfficeTalk's text editor, formatted documents (such as MacPaint or PageMaker files), or applications. Receiving mail is a matter of double-clicking the In Box, then double-clicking each item to open it.

**OfficeTalk's Desktop**

OfficeTalk's data libraries and any private libraries your company may have appear as icons (left). Double-clicking one displays a window listing its contents, which you can download or read by double-clicking on an item's name. The In Box and Out Box hold incoming and outgoing mail.
typeset, you'll pay $2 for every additional 10 minutes. LaserWriter proofs are $2 per page. You can charge your type to VISA or MasterCard and receive it by mail, UPS, or overnight courier. *Office Talk* also offers a logo-conversion service that will transform your firm's logo into a PostScript font so that you can reproduce it in virtually any size.

*Office Talk* isn't a general-purpose information service like CompuServe or The Source. You'll find no up-to-the-minute news and stock quotes, and no electronic shelves bulging with shareware utilities and desk accessories. Instead, there's some clip art you can download (for $2 per graphic), some technical support notes on Microsoft Word 1.05 and PageMaker 1.2, some canned PageMaker layouts you can use as starting points for your own publications, and some tips on using the Linotronic service. CompuServe's data libraries are as overwhelming as the Library of Congress, but you can cover *Office Talk*'s in an hour.

*Office Talk* can also set up private libraries, whose icons don't appear on the desktop unless you're registered as a member of a given organization. One distributing firm uses a private library to get price updates and sales figures to and from its field sales personnel. Pricing for a private library varies, depending on the number of subscribers an organization can offer; but on a monthly basis you can expect to pay about $125 per megabyte of data. That sounds steep, but it can be far cheaper than using express couriers or trying to set up your own computer bulletin board. And *Office Talk*'s Mac-like nature will appeal to businesses that shy away from text-oriented E-mail services.

**Is Anybody Out There?**

Your only difficulty with *Office Talk* may be finding someone to communicate with. At this writing, *Office Talk* had a scant 100 subscribers, versus CompuServe's 300,000. Clearly, if you want to reach out and touch as many modem-equipped Macs as possible, *Office Talk* isn't for you.

If you do need to communicate with a large subscriber base, you might consider instead *Desktop Express*, a communications program that acts as a graphic front end to MCI Mail and Dow Jones News/Retrieval. Instead of requiring typed commands to navigate those services, *Desktop Express* creates a desktop with an In Box, an Out Box, an Address Book, and icons for creating memos. You use *Desktop Express* to write and address correspondence, then it dials and controls MCI Mail behind the scenes by sending the commands you'd normally type.

If you already use MCI Mail and don't require *Office Talk*'s typesetting service, *Desktop Express* is the better choice. But consider *Office Talk* if your company is contemplating E-mail and hasn't yet committed to one service, or if you could use its Linotronic output or private library services. With its spartan data libraries and relatively costly connect charges, *Office Talk* isn't trying to replace CompuServe, GEnie, or The Source. But it is a welcome alternative to those services' arcane commands, and a harbinger of a future in which communicating online will be as easy as pointing and clicking.—Jim Heid

See Where to Buy for product details.

---

**Statistically True**

**Systat 3.1**

**Complete statistical-analysis program.**

**Pros:** fast, full-featured professional statistics system, superior output graphics. **Cons:** Mainframe heritage shows in not-quite-Mac interface. **List price:** $395. **Requires:** 512K; can use single-400K drive but more disk space required for easy operation. **Copy protection:** None.

In the world of professional statistics, the heavyweight programs for scientific minicomputers are BMDP, SAS, SPSS, and Systat. With the introduction of Systat 3.1 for the Mac, the Macintosh now delivers all the types of analysis found in a university computing environment. In fact, according to Leland Wilkinson of Systat, a Mac with a 68881 coprocessor will outrun a mid-range VAX or a Compaq 386 on all Systat benchmarks—which means that no computer selling for under $5000 can compete with the Mac as a serious statistics engine.
The five disks provided with Systat 3.1 contain modules for standard descriptive statistics (STATS), data editing (DATA), cross-tabulation (TABLES), nonparametric statistics (NPAR), correlation matrices (CORR), multivariate linear regression (MGLH), factor analysis (FACTOR), cluster analysis (CLUSTER), time series analysis (SERIES), nonlinear modeling (NONLIN), and graphing (GRAPH). Each module contains the expected standard features, except maximum-likelihood factor analysis. Systat does run on a 400K drive in a 512K Mac, but count on lots of disk swapping. On a 1MB system the graphics module can support additional features such as 3-D plotting.

Mixed Signals
Systat’s interface is a hybrid—it uses menus for handling file operations, inter-module transfer, and the Help directory (see “Nonlinear Help”), but retains a command interpreter core. So unlike StatView 512+, in which all actions are executed through menu choices, Systat uses a BASIC-like language to string together files of commands.

The interface allows great data-processing flexibility. The IF-THEN-ELSE construction, for example, lets you automate a search through a set of data files, examining their statistical descriptions to find a set that matches a particular condition. The program that directs this search can itself be stored as a file for later use or modification. Systat also facilitates complex analysis by recording all your commands during a work session.

It may not have a true Mac interface, but Systat is obliged to accommodate many thousands of Systat users already trained to exploit the power of complex command programs on time-shared minicomputers. Systat on a coprocessor-equipped Mac can compute a 50-by-50 correlation matrix from the FACTOR module in 10 seconds; a standard 40-variable regression analysis takes 20 seconds (these tests used a Leuco Prodigy board, but Mac II and SE coprocessor figures should be comparable). These numbers are comparable to the performance of SPSS on a VAX 11/780. Systat also guarantees the highest numerical accuracy of any micro-based statistics program, and includes a test file called NASTY.DAT so that you can check this for yourself.

Two last points deserve special mention. A major concern of working statisticians is the transfer of large existing data files into a new program. Systat provides an excellent file-import routine, which can read ASCII files with all sorts of delimiters (blanks, commas, tabs). Systat 3.1 also provides 300-dpi LaserWriter output from the graphics module (see “Picture Perfect”). This is the highest output resolution from any widely available statistics package.

Systat is a fast, accurate, relentlessly thorough program for professional statistical analysis—complete with a genuinely humorous manual that provides a complete, easy-to-follow description of program operation. Systat’s interface and price will discourage casual users, but for scientific and commercial use the Systat-Mac combination is the top choice.—Charles Setler

See Where to Buy for product details.

Printworks for the Mac 3.1
Integrated printer-driver utility.
Pros: Substantially enhances ImageWriter printing capabilities and opens the Mac to many other dot matrix printers; has excellent spooling, page preview, and color options; works with the SE.
Cons: Some difficulties with proportional fonts in tabbed output or mixed text/graphics; potential problem with spooler memory set too high; does not yet work with AppleTalk; needs two to three desk accessory slots. List price: $75.
Requires: 512K. Copy protection: None.

Even though LaserWriter output is not available to most of us, this does not mean that quality is out of reach. Printworks for the Mac, from Softstyle, Inc., is a set of transparent printer drivers and associated desk accessories that together raise dot matrix printing to a new art. In addition to a built-in spooler, the program offers Page Preview, three kinds of color printing (on an ImageWriter II), full integration of text and graphics (bit-mapped or object-oriented), and support of many non-Apple dot matrix printers.

Printers, Text, and Graphics
Printworks offers third-party printer drivers for various Brother, Epson, Hewlett-Packard, IBM, NEC, Star Micronics, Texas

Picture Perfect
LaserWriter output gives true 300-dpi resolution, rather than simply plotting graphs at laser-printed screen-shot resolution. Besides dramatic 3-D plots, Systat includes the usual two-dimensional plotting facilities (histogram, bar, box, and stem) and unique plotting modes like fuzzygrams.
Instruments, and Toshiba printers. For example, Printworks can send a combined text and graphics document to a QuietWriter 3, producing quality output rivaling that of a laser printer. Or a Brother Twinnriter can-in one pass-alternate between its daisy wheel and its dot matrix head, on the same line. Although not all third-party printer drivers are included with the package, as many as you need can be requested free of charge on the registration card.

Printworks' Print dialog box (which automatically replaces the standard Print dialog box in almost all applications) contains five text settings: No Text, Digitized (exact graphic printout of the screen—used to print specific fonts), Draft (with significant improvement in word spacing), Standard (using built-in printer fonts and optimized word spacing), and NLQ (using near-letter-quality fonts). The ImageWriter II has only one NLQ font, but with printers containing plug-in cartridges or several built-in fonts, a special Font Adjustment desk accessory allows choosing of fonts. Some alignment problems occur when you use proportional fonts in columnar data (spreadsheets and databases) or with graphics, but you can solve them by using Digitized mode or by changing to non-proportional fonts.

Printworks is also a very useful tool for working with graphics. Selections range from No Graphics (to skip any bit-mapped graphics), to Standard, High (multiple strikes), or Extra High (more strikes). You can also select Digitized to include object-oriented graphics like those from such programs as MacDraw, SuperPaint, and ComicWorks; or No Objects. However, some of these graphic or text options may not apply to all printers.

**Page Preview, Spooling, and Color**

One Printworks option allows you to preview a reduced image of an entire page before it prints, then print it or skip to the next page. You can use this option to test whether a graphic image is bit-mapped or object-oriented. To print draft documents more quickly, you can also print without graphics and use Page Preview to verify that graphics are not included. Page Preview shows you how much of the current page has been spooled into memory, which gives precise control if you want to end printing at a particular place on the page. Setting the spooler memory too high, though, can prevent the Mac from booting the next time you use it. Although the problem is fixable, it is still annoying.

Color options (for the ImageWriter II only) are controlled by the Color Adjustment DA and include Single, Map, and Program options. In Single mode, any document can be printed in any of six colors other than black. Map works with object-oriented graphics and can be set to substitute various fill, line, and hatch patterns with specific colors. You can use this feature to produce color charts and graphics enhanced print quality, and third-party compatibility. It is a definite must for any Mac user with a dot matrix printer. Once you get used to Printworks, you'll probably wonder how you managed so long without its performance benefits.

—Rusel DeMaria

See Where to Buy for product details.

**MacEverything**

**LaserPaint 1.1**

**Integrated graphics, text, and page-layout program.** Pros: Combines text, bit-mapped graphics, and PostScript graphics in a single program, customizable. Cons: User interface is awkward, some traditional Mac functions (Undo, paste to Scrapbooks) not supported. List price: $495. Requires: Mac Plus; external drive recommended. Copy protection: Key disk.

LaserWare's LaserPaint could well be called LaserPaint/Draw/Write, since it integrates all these functions in a single program. This ambitious application combines bit-mapped graphics, object-oriented graphics, text, and PostScript effects. The finished product is printed on the LaserWriter (or another PostScript-compatible printer). LaserPaint can be used to create illustrations or to produce newsletters, ads, pamphlets, or other publications that combine text and graphics. It is not a page-layout program along the lines of PageMaker—it's a graphics program with page-layout capabilities. The program also provides a module that automates the color-separation process for four-color printing.

It Draws, It Paints...

LaserPaint is divided into five separate modes, each of which displays its own panel of icons. Click a button marked D to enter drawing mode, P for painting, L for laser printing, and so on.

The drawing panel's functions are like those of MacDraw or Cricket Draw. In this portion of the program you create lines, Bezier curves, arcs, ovals, and rectangles (see "Drawing Panel"). Lines and curves can be combined to produce complex...
polygons, which can be filled with shades of gray, preset bit-mapped patterns, or patterns you create. A unique "thumbwheel" control lets you adjust your line width from a hairline to more than an inch.

Also unique to LaserPaint is a joystick icon that moves the drawing window anywhere on the program's drawing surface—eight by 11-inch pages. I prefer the joystick to standard scroll bars because it permits diagonal movement as well as vertical and horizontal scrolling. Other features that set the program apart include a tool that draws a spiral, a mask tool, and different styles of caps and joins to enhance lines and corners.

LaserPaint's painting mode employs the same principles as MacPaint-style graphics programs, but several of the tools differ from their MacPaint counterparts. The pen draws black lines in a variety of widths; the marker paints in any pattern with a number of adjustable "tips"; and the fill tool acts like MacPaint's paint bucket, filling an object with a pattern. LaserPaint's paintbrush and airbrush are impressively realistic; in fact, I found the paintbrush too realistic—it runs out of paint when a brushstroke is concluded, and leaves wispy marks like those made by individual brush hairs.

In addition to drawing with LaserPaint's painting tools, you can import bit-mapped graphics from other applications, including TIFF (Tagged-Image File Format) files created with high-resolution scanners. Images can be edited in FatBits at 72, 300, or even 600 dots per inch (however, 600-dpi editing consumes a good deal of memory—and time).

Except for the excellent airbrush, which even includes a spatter cap, I found LaserPaint's painting tools adequate, but not up to the standards of many other bitmap graphics programs. For example, before painting, you must first define a "bit box"—an area in which to paint; users accustomed to MacPaint-like programs may find this annoying. Many of the tools are slow on the uptake; there is a noticeable lag between the time you start drawing and the time a line appears. Also, the brush, marker, and pen produce angular lines rather than circles when quickly moved in a circular pattern.

...It Writes

Press the W button to enter LaserPaint's writing mode. Here you'll find some of the program's most impressive features. Although LaserPaint doesn't provide a full-fledged word processor, the writing mode offers enough style options to pass for a respectable page-layout program.

Text can be typed in a LaserPaint "text box" or imported from another application. You can change the font style and size, the font itself, and the line justification. LaserPaint enables you to arrange blocks of text anywhere on a page or to place them in a variety of preset or custom column formats. You can modify leading and kerning, although LaserPaint's kerning merely adjusts the space between either the words in a line or the letters in an individual word. (Character spacing within a word can be achieved with the Extend or Condense commands, but this feature is not clearly explained in the manual.)

LaserPaint offers several flashy PostScript text effects. For example, you can draw a line, curve, spiral, or irregular path in the drawing mode and attach a line of text to the path. Even more exciting is the program's ability to wrap text around a shape or place it inside one. Unfortunately, this procedure works well only with simple shapes.

Qualms

While I'm astounded that one program can do so much, I'm distressed by LaserPaint's user interface; primarily, I don't like jumping from one tool panel to another to complete a drawing. Furthermore, the modes don't always function smoothly together. When you work in LaserPaint's painting mode, for example, the bit box obscures text or drawings beneath it as you paint.

The interface could use some aesthetic improvement as well—learning a lesson from the clean lines of MacPaint or CricketDraw. With its myriad buttons, gauges, dials, and occasionally odd icons (a snake, a butterfly net), LaserPaint is harder to learn than programs that replicate interfaces established by earlier programs.

Fortunately, if you don't like LaserPaint's icons, you're free to create your own. Not only can you edit individual icons, but you can arrange them in a custom panel accessed with a button. While it takes some effort, the ability to customize the program is one of LaserPaint's best features. LaserPaint has problems more serious than a slightly offbeat interface, however; several fundamental functions will be missed by those accustomed to the typical Mac interface. For instance, text and graphics can be pasted from the Scrapbook, but LaserPaint will not paste objects to the Scrapbook (the Clipboard is supported, though). In addition, the Undo function appears in the Edit menu, but the
program's designers were unable to implement it. Finally, LaserPaint's 180-page manual fails to explain adequately many of the program's features. (Help screens alleviate the problem somewhat, but a good manual is essential with a program this complex.)

On the positive side, LaserPaint offers an amazing number of features on a single disk. Rather than invest in a page-layout program, a painting program, an object-oriented drawing program, and a PostScript effects program, you might prefer the integrated approach. But keep in mind that LaserPaint's modes don't necessarily offer all of the functionality of their single-application counterparts. LaserPaint is a step in the right direction—toward integrating graphics and page layout—but the program is seriously hampered by its poor documentation and overly complicated user interface. For now, I'll take ease of use over a multitude of features; bigger is not always better.—Erfurt Nielsen

See Where to Buy for product details.

Dark in the Heart of Texas

OmniLaser 2108
PostScript laser printer. **Pros:** Runs faster and prints darker than LaserWriters; high-end durability; emulates Hewlett-Packard printers and plotters; accepts font cartridges. **Cons:** Small type prints muddy; status display illegible at a distance. **List price:** $5995. **Requires:** 512K, AppleTalk or compatible connector, and cable.

Texas Instruments' OmniLaser 2108 is a recent arrival in an increasingly crowded corral of PostScript laser printers (see "Laser Wars," Macworld, June 1987). But the 2108 is a horse of a different color. It's one of the few LaserWriter-class (under $6000) printers built around a heavy-duty Ricoh print mechanism rated at 10,000 pages per month. The Canon engines in Apple's LaserWriters and QMS's PS-800 series are rated at 3000 pages per month; you're asking for mechanical problems if you exceed that figure. And the Ricoh engine produces extremely dense black images, without the scan lines that appear in the output of Canon-based printers. These and other differences make the 2108 more than an also-ran in the field of PostScript printers.

Saddling Up
The 2108 has roughly the same Texas-sized footprint of a Canon-based printer. To set up the 77-pound printer, you must install a toner cartridge and the disposable transfer belt that applies toner to the paper. Installing the photosensitive belt requires fast action; you can shorten its life span by touching its surface or exposing it to room light for more than five minutes. But the job is no harder than loading film into a camera. Working carefully, I did it in about two minutes.

Lasers at a Glance

<table>
<thead>
<tr>
<th>Specifications</th>
<th>OmniLaser 2108</th>
<th>LaserWriter Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM (in megabytes)</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>ROM (in megabytes)</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>PostScript version in unit tested</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>Built-in fonts</td>
<td>13</td>
<td>35</td>
</tr>
<tr>
<td>Free memory available at start-up (in bytes)</td>
<td>315,196</td>
<td>174,040</td>
</tr>
<tr>
<td>Size of font cache (in kilobytes)</td>
<td>286</td>
<td>160</td>
</tr>
<tr>
<td>Number of paper cassettes</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Maximum paper size (in inches)</td>
<td>8½ by 14</td>
<td>8½ by 14</td>
</tr>
<tr>
<td>Capacity of paper cassette (in sheets)</td>
<td>250</td>
<td>100</td>
</tr>
<tr>
<td>Print engine manufacturer</td>
<td>Ricoh</td>
<td>Canon</td>
</tr>
<tr>
<td>Engine duty cycle (in pages per month)</td>
<td>15,000</td>
<td>3000</td>
</tr>
<tr>
<td>Writes white or black</td>
<td>white</td>
<td>black</td>
</tr>
<tr>
<td>Interfaces</td>
<td>A, R, P</td>
<td>A, R</td>
</tr>
</tbody>
</table>

| Emulation Modes | | |
|------------------|------------------|
| Diabola 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855 | $5995 | $5799 |
| OmniLaser 210 LaserWriter Plus | 2 | 1.5 |

| List price | \$5995 | \$5799 |
| Performance (in minutes:seconds) | | |
| Initialize and print simple document | 03:37 | 04:04 |
| Print simple document after initialization | 02:12 | 03:01 |
| Initialize and print complex document | 06:58 | 22:36 |
| Print complex document after initialization | 05:51 | 21:09 |

1. A stands for AppleTalk; R, RS-232C; and P, Centronics Parallel.

A Master Mocker
The 2108 has impressive impersonation skills. Besides being completely compatible with LaserWriters, it can mimic a Texas Instruments 855 dot matrix printer, a Diablo 630 daisy wheel printer, a Hewlett-Packard Laserjet Plus, or a Hewlett-Packard 7475 plotter. None of these modes can match PostScript's text- and graphics-handling capabilities, but they do make the 2108 an excellent choice for offices using IBM PC programs that don't support PostScript.

You select the printer's emulation mode and interface by using several front-panel push buttons. Above the switches, a calculator-like liquid crystal display (LCD) shows the current mode and displays a menu for choosing among the printer's serial port, the AppleTalk port, and the Centronics parallel port (which is the standard printer interface on IBM PCs). When the printer is processing a job, the display...
A Bold Performer

The 2108 performed admirably for me, printing a document containing numerous fonts and bit-mapped graphics roughly three times faster than Apple's LaserWriters (see "Lasers at a Glance"). The printer never approached its engine's eight-page-per-minute rating, but I have yet to see a PostScript printer that does. The 2108 was just short of overtaking the fastest LaserWriter-class printer available, QMS's PS-800 Plus. The 2108 doesn't have as much free memory for downloadable fonts as the PS-800 Plus, but it still offers nearly twice that available in the LaserWriter Plus.

Unlike the Canon engines in LaserWriters and in the QMS PS-800 series, the OmniLaser's Ricoh print mechanism is a write-white engine; instead of exposing areas of the photosensitive belt that will appear black on the page, it exposes areas that will appear white. The result is an image with extremely dark, bold blacks. Graphics containing large black areas look superb, but text, especially 10-point and smaller sizes, appears muddy, with the enclosed areas of letters such as the lowercase e partially filled in.

The 2108 outclasses Canon-based printers in other ways. It boasts a half-megabyte more memory than a LaserWriter Plus. Its paper cassette holds 250 sheets versus the LaserWriter's 100. It has two front-panel slots for accepting plug-in font cartridges, and its paper transport delivers pages in the proper front-to-back order.

You should consider the OmniLaser 2108 if you expect to print more than 3000 pages per month, and if you can exploit its versatile emulation features and its Centronics parallel interface. But do examine its output first to judge whether it's too dark for the types of documents you print. Speed, ruggedness, and versatility are excellent traits to look for in a laser printer, but the real proof is in the printout.—Jim Heid

See Where to Buy for product details.

Film Scoring Simplified

 Cue: The Film Music System 1.0

Film-scoring program. Pros: Quickly collates and converts film and video timing cues; finds tempos for key-bit points; cue sheets provide detailed timing and descriptive information; prints custom score paper, master cue sheets, and performing rights cue lists. Cons: Does not support all professional film and video timing formats; offset feature is buggy and convoluted; price is prohibitive for the amateur or semiprofessional film composer/editor. List price: $499. Requires: 512K. Copy protection: Key disk.

Clicktracks 2.0

Film-scoring program. Pros: Inexpensively converts click information to musical tempos; compiles a list of key-bit points and scans bit list to find best tempo; supports nearly all film and video formats. Cons: Very limited in the number of cues it can analyze and collate; slow and buggy; bit list can contain only minimal descriptive cue information. List price: $85. Requires: 512K. Copy protection: None.

Mating music to film involves meticulous calculations and tedious paperwork. Two programs, Cue: The Film Music System by Opcode Systems and Clicktracks 2.0 from Scores Unlimited, make the process less frustrating for the film composer by generating cue sheets and converting film tempos to musical tempos.

A Question of Time

Cue not only handles all the computations involved in translating and matching the film editor's timing references to sections in the musical score, but also accurately converts the timing references to the different formats of film and video. Timing formats are assigned in the Set Format dialog box—allowing cue times to be input in feet/frames for film, SMPTE time-code numbers for video, or in hours, minutes, and seconds if stopwatch timings are used.

While useful, the time display selections do not represent all the professional film and video formats currently in use. The SMPTE time display measures only 30 frames per second, and the film time display measures only 35mm feet/frames. The absence of such common professional timing formats as NTSC color drop frame (29.97 frames per second), European video standard (25 frames per second), 16mm film, Super 16mm film, and 70mm film is puzzling for a program aimed at the professional user, and it definitely limits its flexibility.

Collating Timing Information

With Cue, each cue is formatted according to production title, cue number, and offset information; cue timing can be shown in absolute or elapsed time in the Cue Sheet, while the Input window always shows absolute time values.

Cue simplifies the task of collating all timing information in a script. Once you select the film or video format, you enter cue information in the Input window and the program displays the results in the Cue Sheet window in three columns. The first column shows the timing reference (when the cue starts), the second lets you describe the associated action in the film or video, and the third references the musical beat for the cue (see "Collating Timing Information").
On the Beat

The next major step for the composer is to find a musical tempo in which important points in the film fall on the beat, so that those points can be accented effectively by the score. A Key Hit box checked in the Input window lets the composer quickly locate important moments in the film score on the cue sheet. Then, while in the Search Tempo mode, Cue looks for the best tempo that will strike all key-hit points. It resolves the key hits to the nearest quarter note, eighth note, or triplet within a predefined range of tempos. The program compiles a list of all key-hit point tempos found, thus allowing the composer to decide which tempo most closely matches the one originally desired. Cue lands the key hits on the beats of the tempo you choose.

The Set Offset menu selection lets you globally alter an entire cue sheet after it has been created. If the director removes four frames from a scene, the Set Offset feature allows you to remove those four frames from all timings in the cue sheet. This important feature is also the most convoluted function of Cue. Instead of saving time, it can actually create more work (for example, by not automatically transferring offset information from the Running Time dialog box to the Set Offset). There are other problems with this feature as well: some operations are inconsistent, while others can even cause system bombs.

However, Cue has better-implemented features that do save time. The Master Cue List and Performing Rights Cue Sheet functions compile all saved cue sheets in a production (see “Side Benefits”). All information originally entered into the Cue Information window is listed numerically by reel and cue number. The Master Cue List serves as a bible for composers and editors on all cues within a show, while the Performing Rights Cue Sheet is important for copyright and royalties information. Cue will even take timing, tempo, and meter information from any selected cue sheet and generate custom score paper that shows all timing and descriptive information for each measure above the staff. (This is especially impressive when printed out on a laser printer that has the Sonata font by Adobe.)

Another handy feature is the stop-watch in the Input window for manually timing cues. Once the stopwatch is selected, hitting any key starts and also stops the timing; the time elapsed is shown in whatever format was previously selected. This feature lets you obtain an accurate timing if you do not have access to a metronome or a videotape with visible SMPTE numbers.

Finally, Cue has several unique features that give the film composer alternative ways to approach the scoring of a film. Play Clicks will send the click track of a selected cue sheet out of the Mac speaker or external speaker jack. This click track can be recorded directly to tape, or if the composer feels limited by the click track, Cue’s Free Timing window will generate an animated graphic that shows when key hits occur. These options are a boon when troubleshooting a difficult cue that cannot be resolved by the traditional method of conducting the orchestra while following a click track. These features nearly justify Cue’s $495 price.

A Less Costly Alternative

Those who need a less expensive click-to-music tempo converter might turn to Clicktracks 2.0 by Scores Unlimited. Clicktracks 2.0 is a collection of three programs written in Microsoft BASIC: Clicktracks, Hitlist, and Scan. The Clicktracks module is really just a computerized version of the infamous Big Clock Book, an authoritative reference text that shows where each film frame falls in relation to the beats of a given tempo. The Hitlist and Scan modules are similar to Cue’s Cue Sheet and Search Tempo features. The compiled Hitlist can be scanned for the best possible tempo, and later printed out (see “Click-to-Music Tempo Converter”).

Clicktracks 2.0, however, is limited both in the amount and in the types of data it can manipulate. Many features are sluggish but are still usable on most projects. Furthermore, unlike Cue, Clicktracks 2.0 supports nearly all film and video formats and has a crude but functional offset feature. For the novice film composer, it’s a good value for the money.

Side Benefits

A wide variety of useful information is stored in each cue; this is used later for Cue’s Master Cue Sheet and Performing Rights Cue List, both of which are necessary documentation.
Reading by Computer

**Portal 1.0**

**Computer novel.** Pros: First-rate science fiction narrative. Cons: Would be faster in a RAM disk or on hard disk; but only works from floppy drive; reservations about reading novels on a CRT. List price: $49.95. Requires: 512K. Copy protection: Key disk.

Portal is the first interactive program to call itself a computer novel. Written by Rob Swigart and published by Activision, Portal is a compelling, complex, and often plausible science fiction story.

The story takes place in 2016, apparently a pretty bad year for humans on planet Earth. Returning from an outer space mission, you find no one. Not a soul. Not even the proverbial "last surviving man (woman)." In fact, you're him (her). You do find that Worldnet, the massive multidimensional computer system that spans the globe and reaches into the nearby space colonies, is functioning, though not very well. Still, enough of the global network is operating for you to piece together the story of the disappearance of humanity. You pursue the truth by using the available nodes of the computer.

While you're scanning the few accessible bits of data left in History, Centaur Launching, and Medl0 (3 of the 12 "data space" nodes in the Worldnet system; see "Story Fragments"), your research is interrupted by Homer, the raconteur node—a complex algorithmic crystalline AI computer that takes the massive input from Worldnet and turns it into cohesive narrative. Homer wakes up (so to speak) distraught that there is no one left to hear his tales; he's encouraged by your presence, though, and asks you to help him remember what has happened. Gradually, with Homer's help, you unravel the complex story of Peter Devore, Regent Sable, the Mentor, and others who played pivotal roles in the events preceding humankind's demise.

Homer delivers the story in short episodes with supporting information from History and other nodes (SciTech, Psilink, Military, Edmod, Life Support, Geography, Wasatch, and Psychological). You can read some parts of the novel out of sequence, either by accident or by intention, but most of the story is only presented after previous parts have been read, so your role is controlled. A flowchart of the entire novel is available from Activision. It takes nothing away from the story, and it helps you orient yourself within the narrative.

You interact with Portal (except when you sign in) by using the mouse, so you can simply relax, sit back, and read. Pleasant sound effects occasionally punctuate the story but aren't critical, and you can turn the sound off. Prepare to do a lot of reading; it took me almost three full days to complete the story. The program is, in fact, a full-length novel on three disks. Fortunately you can save your place at any time and come back to it later.

As software, Portal is well conceived and enjoyable. As literature, it is a first-rate novel with wit, warmth, mystery, and adventure. My only reservation about Portal is that I might have been more comfortable reading this story in a conventional book. Long stretches watching the screen tired my eyes more than reading a book does. On the other hand, I experienced a sense...
of freedom and participation playing Portal on the computer that I would have missed with a novel. Portal may well be a first step toward a new genre of computer entertainment. As Swigart puts it, "Portal may be the 'Great Train Robbery' of computer novels."—Rusel DeMaria

See Where to Buy for product details.

For FORTH Programmers

**Macb 2.1**

FORTH programming language. Pros: Complete development system; includes assembler, editor, debugger, numerous utilities; multitasking; fast compilation and execution; compact, well-written manual. Cons: Departs from FORTH 83 standard; not suggested for novice programmers. **List price:** Version 2.11 $99.95. **Requires:** 512K. **Copy protection:** None.

A professional software developer looks for several things in a development system—compilation and execution speeds, a code library, and a selection of programming utilities such as editors, disassemblers, and debuggers. The FORTH programming language Macb 2, from Palo Alto Shipping, provides these tools and several extra features as well. And at $99.95, it is readily accessible even to casual programmers who want to tinker with the Mac's hidden power.

**Vital Statistics**

*Macb 2* is based on FORTH 83 but is not restricted by the 16-bit address limitations of that standard. And unlike the indirection threading of words found in standard FORTH, *Macb 2* words are direct subroutine calls, so programs run at near-assembler speeds. Also, *Macb 2* can accept regular Macintosh text files for source code instead of the "screens" normally associated with FORTH.

*Macb 2* includes several features necessary for creating large, complex programs. Among these features are multitasking capability, dynamically loaded overlays, separate dictionary headers, and local variables.

For multitasking, *Macb 2* employs the round robin system often used in game programs or printer spoolers. Each task runs until it gives up control to the next task in the queue.

Dynamic overlays are useful for creating a very large program or a program consisting of numerous individual sections. When planning a program, developers break it into segments, or independent sections of code. A program segment is called into memory only when needed. Otherwise, the segment is removed, and its memory space is released. The *Macb 2* utilities, including the editor and assembler, are all written as segments.

Separate headers also reduce the amount of memory needed by a completed application. All of the information used by the FORTH compiler during program development is held in an area of memory separate from the actual program subroutines. When you give the TURNKEY command, only the subroutines are saved; the compiler information is dropped. (Incidentally, application programs created by using the TURNKEY command may be distributed license-free.)

The use of local variables makes *Macb 2* programs easier to follow and much easier to write. They are implemented as a stack-frame environment, partially addressing some of the complaints about FORTH's rather naked parameter stack and its unwieldy collection of stack-manipulation words.

**Utilities, Libraries, Manual**

As a complete development environment, *Macb 2* includes a program editor and an assembler, a disassembler and debugger for checking the execution of programs, and a library of functions to access the various Macintosh utilities. The program editor was not available when this article was written, so a simple Macintosh text editor was used instead.

*Macb 2*'s tools are all accessible from within the programming environment. The assembler is not the Reverse Polish assembler usually associated with FORTH, but uses the familiar syntax of standard 68000 assemblers. And because it is subroutine threaded, *Macb 2* allows you to embed FORTH words within machine code. They are simply assembled as subroutine calls.

The code library includes functions to call the Macintosh Toolbox, gives programmers access to the SANE floating-point and transcendental functions, provides a vocabulary of I/O words, and offers the Macintalls speech utility. Provision is also made for defining Macintosh resources and events.

The manual, which is generally well written and illustrated with many examples, is divided into two sections. The main section covers various aspects of programming on the Macintosh. It assumes the reader is already familiar with using FORTH to program on the Mac and therefore may be difficult for an inexperienced...
programmer to follow. However, Palo Alto Shipping provides technical phone support as well as "RoundTable" on the GEnie online network. The reference section is particularly well organized, both for quick help and for in-depth information on the internal structure of the language.

Wrap-up

*Macb 2* is a solid product at a reasonable price, and it includes many of the features and utilities required by professional programmers. Its many enhancements are of great value, though the FORTH 83 standard was often compromised to include them. Overall, I feel that any faults in this product are more than adequately balanced by its strengths.—Ken Takara

See Where to Buy for product details.

### Two Electronic Editors

**Doug Clapp’s Word Tools**

1.0

*Style and punctuation checker.*  **Pros:** Fast; style checker catches common pitfalls. **Cons:** Inadequate manual; cannot read Word 3.0 files. **List price:** $79.95 ($119.95 with Speed Spell). **Requires:** Copy protection: None.

**Tools for Writers**

1.1

*Writing improvement program.*  **Pros:** Allows extensive revision at any time; excellent manual. **Cons:** Slow; sometimes awkward to use; reads only text files. **List price:** $17 plus $8 for shipping and handling. **Requires:** Copy protection: None.

While nearly every writer can benefit from a personal editor, few can afford such a luxury. You can call on either of the programs described here, however, as an electronic editor for help and advice at any time.

**Word Tools**

Doug Clapp’s Word Tools by Aegis Development checks punctuation and style, marks your longest sentences and paragraphs so that you can revise them later, and analyzes your writing using a variety of standard tests.

#### Style Conscious

Word Tools’ style checker displays errors, clichés, and similarly suspect words and phrases; it then suggests changes and allows you to fix each one on the spot.

It’s a lot like using a spelling checker. First you select a document, then click on any one of the icons representing the program’s three major routines: Count, Style, and Punctuation. Word Tools opens MacWrite and Word 1.0 files directly, other word processor files must be in text-only form.

Word Tools’ most obviously useful features are its style, punctuation, and “extremes” checkers. The style checker compares your prose to an editable, 900-entry “suspect-style” file. After a document has been checked, the Improving Document window displays each stylistically suspect word or phrase (such as “rather,” “fairly,” “at the present time”) in context. Underneath is a suggested improvement, an explanatory comment, and buttons for taking some action (for example, make the suggested change, insert one of your own, mark the passage for later revision). As mechanical and impersonal as this may sound, the style checker is surprisingly helpful in catching clichés, hack phrases, and the like.

The punctuation checker works like the style checker, locating such difficult-to-find errors as extra or missing spaces and misplaced commas. The extremes checker allows you to mark overly long sentences and paragraphs for later editing.

Three kinds of reports are provided by the Results window: Counts, Averages, and Extremes. Counts shows the total characters, words, sentences, and paragraphs in your document. Averages tells you the length of the average word, sentence, and paragraph; Extremes does the same for the longest ones. The Rankings window displays several indexes—including the Interest Level and the (school) Grade Level—that are supposed to determine your document’s readability and its appropriate audience. The Word List window displays a word-frequency list, which tells you how many times each word has appeared in your document. Unfortunately, you’re not likely to find these reports and indexes very helpful, since the Word Tools manual fails to explain how to use the information they contain. For example, the word-frequency list doesn’t indicate which words should be used sparingly, while the Interest Level index offers no ideas about how to make your document more engaging. But even if you discover how to change your index results, how accurately can they evaluate your writing style? Readability and interest levels are determined by too many factors to be easily reduced to a simplistic word- or sentence-length formula.

Despite its polished look, Word Tools also has some irritating foibles. It handles input errors poorly and sometimes refuses to complete a requested count or check. And some of the entries in the suspect lists are suspect themselves, while the style checker sometimes lists word fragments like the “very” in “everyone.”

**Tools for Writers**

Tools for Writers, by Kinko’s Academic Courseware Exchange, was written with students and teachers in mind. It lacks the polished look of Word Tools and does not always run as smoothly as it should. On the other hand, it contains some of Word Tools’ most useful functions and a few others besides. Unlike Word Tools, however, Tools for Writers is organized around specific writing problems. While this format tends to make the analysis of a single document rather laborious, it is an excellent way to improve general writing skills.

#### Eliminating Vagueness

*Tools for Writers* Vague Word Finder marks ineffective words or phrases and suggests changes at the end of the document.
Although Tools for Writers works only with text files, you can revise or create documents within the program. As does Word Tools, the program computes the number of words, sentences, and paragraphs, and it calculates average sentence and paragraph length. Tools for Writers also compiles word-frequency lists. Unlike the documentation for Word Tools, however, the Tools for Writers manual extensively discusses potential uses for the counts, averages, and lists.

The rest of Tools for Writers addresses specific writing problems. The Vague Word Finder marks a variety of vague or ineffective words and phrases ("some," "totally," "for the reason that") and adds referenced comments at the end of the document. The Be Finder marks all forms of the verb "to be" and reports the percentage of sentences that contain such weak constructions. The Subordination Checker marks all the subordinators and coordinators in your document and tells you if too many were used. And the Article Use Checker analyzes article usage, marking them and reporting those you overuse.

After Tools for Writers has marked a document, the user must go back, search for the marks (with the program's Find command), and decide whether the marked passages can be improved. Here Tools for Writers excels, for the exercises in the manual show how to use each part of the program effectively, how to judge correct and incorrect usage, and how to improve your writing overall.

A Helping Hand

Although neither program can match a human editor, each one has something to offer writers. Word Tools is fast, easy to operate, and most helpful as a quick way to fix common style and punctuation errors. Because its manual is so skimpy, however, the usefulness of at least some features will remain a mystery to many. As a result, Word Tools is probably best suited for work that needs only a light edit.

Tools for Writers is more schoolmarmish, less polished, slower. But because the program is carefully aimed at specific writing problems, and because the manual takes pains to show how to use all the tools at your disposal, it is much more likely to improve your overall writing skills. —Robert Eckhardt

See Where to Buy for product details.

---

### Shareware DA

### Text Utilities

#### Grep-Wc 1.1

Desk-accessory text utility. Pros: Reads documents from within an application; can save text files; documentation; search features. Cons: Does not allow editing, can only read MacWrite or text files. List price: Free. Requires: 128K. Copy protection: None.

#### miniWriter 1.34


#### Smart Quotes 1.1


---

Want to enhance your word processing or work with text files? Three desk accessories, widely available on electronic bulletin boards, promise to help. One lets you read text and MacWrite files from within other applications or MacWrite itself, in effect opening a read-only window. Another lets you write, edit, read, and print text-only files. The third automatically changes plain vertical quotes entered from the keyboard to the more attractive style used by typesetters ("), without hitting the Option key. One is free; the other two are inexpensive shareware.

Grep-Wc

Hiding under the cryptic name of Grep-Wc is a handy DA that reads and counts words in text and MacWrite files. You can use it to read on-disk documents from any application that supports DAs. It can open a second window in MacWrite, too. Although Grep-Wc won't let you edit the document, it will save it as a text file, which you can then open with a text-file DA and copy via the Clipboard into MacWrite. That may not be elegant, but it's adequate if your cut-and-paste needs are modest, or if you only need to read another document. The word-count feature is also a handy supplement to MacWrite.

The acronym Grep (globally search for Regular Expressions and Print) means the ability to show on the screen every line in a document containing a string of characters—even to look for those characters at only certain places in each line. However, for most people the real value of Grep-Wc is its ability to read MacWrite and text files from within applications.

Grep-Wc is limited to reading only those files, ignoring MacWrite formatting information and pictures. It uses no scroll bars but starts at the beginning and runs the document sequentially through its screen window. (Be sure you get version 1.1, since version 1.0 bombs on MacWrite 2.2 documents.) You might ask more from
# Reviews

A commercial product, but Grep-Wc is extremely useful, reasonably small at 12K—and free.

**miniWriter**

Text files are handy for notes, file transfers between programs or computers, and many other purposes, but they are awkward to use with word processors like MacWrite. miniWriter is a new shareware DA that lets you write, read, edit, and print text files as large as 30K, a limit imposed by the DA format. (Grep-Wc only lets you read them.)

Written by David Dunham, creator of the DiskInfo DA, miniWriter has more features and flexibility than its major shareware competitor, the venerable MockWrite DA. For example, **miniWriter** comes with a special ImageWriter font, to show how output will look on an ImageWriter I or II. It adds extra characters to the ImageWriter internal fonts and lets you pick display font and size. For printing, you can select from standard ImageWriter fonts and specify bold or underline style; **miniWriter** also works with the LaserWriter. A handy Get Info command gives a near-instantaneous word count. What’s more, **miniWriter** costs only $12, compared with the $35 list price for the full MockPackage.

The bad news is that with the ImageWriter font, **miniWriter** adds 32K to your system file, compared with only 11K for MockWrite. That makes it hard to squeeze into a RAM disk in a 512K Mac or onto 400K disks. **miniWriter** also suffers from a “feature” that many users may consider a bug. It has a default setting that automatically converts ordinary quotes to “smart quotes,” which look nice on paper but translate into garbage symbols when you send text files to other computers.

**Smart Quotes**

Finally, if you like curved quotes in finished documents, you’ll want **Smart Quotes**—a DA written by the editor of a small Boston-area literary magazine. Press the quotes key, and you’ll get curved apostrophes and double printer’s quotes (alternating open and closed quotes) without having to use the Option key. It’s simple and indestructible, and it works with most applications, including MacWrite, Word 3.0, WriteNow, and MindWrite. However, it does not affect DAs such as **miniWriter**.

All three DAs come with on-disk documents. They run with Systems 2.0, 3.2, and 4.1, on the 512K Mac, the Plus, and the SE, as well as in 128K Switcher partitions. Grep-Wc should be in the library of every Mac user, even those who don’t own MacWrite. So should a text-processing DA, though the choice between **miniWriter** and MockWrite depends on your needs and system configuration. Smart Quotes is more a specialty item, though it can add a touch of class to printed output. Smart Quotes and **miniWriter** are good examples of why it pays to shop the shareware market, while Grep-Wc is an outstanding example of the public domain tradition of users freely sharing programs they’ve developed for their own use.—Jeff Hecht

See Where to Buy for product details.

---

## Using the LaserWriter with the PC

### TOPSPrinc 1.08
**PC-to-LaserWriter networking software.**

**Pros:** Easy installation; good documentation, no limit on number of fonts and attributes in a document.  
**Cons:** Can’t handle proportional spacing; must be reconfigured to switch between PostScript and ASCII/Diablo printing; bit-mapped graphics only.  
**List price:** TOPSPrinc $189; TOPS network $389. **Requires:** 512K PC (IBM or compatible); TOPS for the PC (board and network software). **Copy protection:** Serial number detection.

### PSPrinc 1.01
**PC-to-LaserWriter networking software.**

**Pros:** Menu-based options; options for paper size and orientation.  
**Cons:** Can’t handle proportional spacing; limit of four font and attribute combinations per document for PostScript translation; confusing documentation; poor error handling; no graphics capabilities.  
**List price:** PSPrinc $150; PC MacBridge board $250. **Requires:** 256K PC (IBM or compatible); TOPS network AppleTalk board. **Copy protection:** None.

### LaserScript 2.16
**PC-to-LaserWriter networking software.**

**Pros:** Custom routines for WordStar, MultiMate, and 1-2-3 spreadsheets and graphs; PostScript routines.  
**Cons:** Can’t handle proportional spacing in spreadsheets and reports.  
**List price:** LaserScript version 3.0 $150; PC MacBridge board $250; PC MacBridge Plus (board). PSPrinc, LaserScript, several other utilities) $650. **Requires:** 256K PC (IBM or compatible); TOPS network AppleTalk board. **Copy protection:** None.

---

The LaserWriter, Apple’s laser printer, has a built-in capacity for use with almost any PC running MS-DOS. Plug in the proper serial cable (the one used to hook a PC to an HP LaserJet works fine), invoke a few special commands, and you can easily print from most MS-DOS programs to the LaserWriter. But this quick-and-dirty direct-connect approach creates problems: you’re almost always limited to one typeface (Courier), and you’ll have to throw a switch on the...
printer that cuts off any users connected to the LaserWriter by AppleTalk—a move that will make you less than universally popular among your coworkers.

Three commercial products—Tangent Technologies’ PSPrint, its deluxe add-on LaserScript, and Centram’s TOPSPrint—address the issues of adding fonts and attributes to your PC documents, translating them to PostScript, and sending them over AppleTalk to the LaserWriter. PSPrint and TOPSPrint try to do all this as transparently as possible by working from inside your normal PC application programs, while LaserScript offers extra features but is less transparent. Each offers different options, and none quite achieves the ultimate goal of a seamless connection.

Get Set to Net
To use any of these products, you’ll need the appropriate AppleTalk circuit board (a Tangent PC MacBridge or a TOPS network card) installed in your MS-DOS machine. Tangent offers the least expensive solution, bundling PSPrint with PC MacBridge for $350, while Centram charges $389 for its board and network software, then another $189 for TOPSPrint.

Once the board’s in, you’ll need to go through a brief installation procedure that includes modifying your config.sys and autoexec.bat files. TOPSPrint handles this in a particularly nice way, automatically adding its commands to the critical files. You’re up and running now if your application comes with its own Postscript driver (Microsoft Word, Windows, WordPerfect, Lotus’s Manuscript, and a few others do). But be aware that a little fine-tuning may still be necessary: both programs, for example, require you to edit a line or two in Word’s LaserWriter driver before you can successfully print.

If the application you’re using on the PC does not have its own PostScript driver, you’ll need your print program to help you with font selection and size, page orientation, and PostScript translation. Here’s where the programs really diverge, with LaserScript offering the most sophisticated options and PSPrint and TOPSPrint offering ease of use.

TOPSPrint
TOPSPrint lets you embed short codes in a document to specify your choice of fonts and attributes. If you then set up your software for printing to an Epson dot matrix printer, TOPSPrint translates the Epson instructions into a PostScript file to drive the LaserWriter. It’s easy, it’s networked, and it lets you access the laser’s fonts and features...in theory.

In practice, you’ll get mixed results, depending on the type of document and the fonts you select. If you use Courier, your documents will look as good as that font can look. The Epson-to-PostScript translation utility, however, can’t handle proportional spacing well. This means that spreadsheets or database reports printed in fonts like Times or Helvetica come out with snaking columns: where each row in the second column begins depends entirely on the length of the same row’s first-column entry. While problems in text documents will be less noticeable, any tabbed or columnar information will exhibit this problem.

Graphics are even worse. In Lotus’s 1-2-3, for example, TOPSPrint takes the Epson bit-mapped PICT file output and reproduces it in blotchy laser dots. Lotus’s
font choices for graph labels—block, roman, italic, script, and so forth—are not changed to Laser fonts, but left as bit-mapped graphics, resulting in almost unreadable text.

It's disappointing that such a well-implemented program falls short in such essentials as font variety and graphics output. TOPSPrint has a good interface, a model installation procedure, and a clear, easy-to-read manual. But when all is said and done, it succeeds in just two areas: it essential s as font variety and graphics out­

put. But when all is said and done, it succeeds in just two areas: it networks output from programs with their own LaserWriter drivers, and it facilitates Courier/Amiga emulation output from inside any other program.

PSPrint and LaserScript
Like TOPSPrint, PSPrint also takes normal printer output and creates a PostScript file for the LaserWrtie. Rather than embedded codes, it makes use of a front-end menu to access the LaserWriter's features. This is matter of personal preference: TOPSPrint's codes offer more flexibility in font and attribute choices and let you work entire within your application, while the PSPrint menus are less cryptic and offer several additional formatting choices, but may require you to leave your application program to select new settings.

Two of PSPrint's menu settings are especially noteworthy. One makes it easier to alternate between printing from applications with their own PostScript drivers and those that need PSPrint's own PostScript translation, without any extra steps. (TOPSPrint requires a bothersome trip through its configuration program each time you switch, for example, between printing WordStar and printing a 1-2-3 spreadsheet.)

The second useful feature addresses the difficulty of specifying fonts within most PC applications. PSPrint uses the limited-attribute choices built into almost all applications—normal, bold, italic, and bold italic—to trigger font changes on the LaserWriter. Using the menus, you build a table of equivalences that PSPrint uses in printing your document. You could, for instance, make the body of your text Times by setting normal to Times, then add Helvetica headlines by setting italic to Helvetica in the PSPrint menu and using your regular PC application commands for italic on all headlines. This is easier than embedded codes but limits you to four choices.

Unfortunately, PSPrint exhibits many of the same limitations as TOPSPrint. When you're working with anything other than straight text, in any font other than Courier, columns don't line up properly, and tabs are erratic. And there is no way to output graphics at all.

LaserScript
Tangent's solution to this is to sell you (for an additional $150) a more enhanced product called LaserScript. Used in conjunction with PSPrint and the Tangent board, LaserScript has several extra bells and whistles not found in the regular PSPrint package: it converts formatted WordStar and MultiMate files to PostScript for laser output, it lets you print 1-2-3 graphs in sharp laser lines and fonts, and it even outdoes 1-2-3 itself by giving you a way to easily print graphs and spread­sheets on the same page. It also lets you add PostScript commands to some of your documents for even better customized results.

With all these great features, though, even LaserScript can't master the problem of accurately printing columnar spreadsheets and database reports in any font but Courier. And what's more, all this power is inaccessible from within your PC applications.

Connectivity Compared
There's no clear-cut winner. After all, it's never going to be completely painless to print to a proportionally spaced printer with high resolution from a machine using a monospaced monitor with low resolution; at best, compromises will be necessary. The fewest compromises are encountered in programs that have their own PostScript drivers; even proportional fonts work fine in these programs. For programs without this capability, TOPSPrint is best at approximating the normal print­from-within-application ease; PSPrint has the lowest price and several useful formatting features; and LaserScript has special options for WordStar, MultiMate, and 1-2-3 users.

For the widest range of features and options, you'll probably want to buy both of Tangent's products. Be prepared for some confusion, though, since PSPrint and LaserScript are not designed to work together smoothly, and the documentation—consisting of two manuals and various addenda and notes, with no indexes—is confusing and rife with grammatical errors and typos. Tangent's products aren't bug-free either; PSPrint can occasionally lock up the PC or drop you out to DOS.

The market should respond quickly to the large number of PC users printing on LaserWriters by combining the features of PSPrint and LaserScript with the well­documented ease of TOPSPrint.

—Cynthia Harriman

See Where to Buy for product details.

A Pair of Deuces

Plus-20

Magic20

The Plus-20 from Peak Systems and the Magic20 from Magic Products are two 20MB hard disks that differ only in software and in minor design features. The 20MB SCSI disk market is now crowded with offerings, making product selection even more confusing for the end user. One clear selection criteria, however, is performance, and these two prod-
ucts suffer from performance problems that make their competitors more attractive buys.

Hardware
The Plus-20 and Magic20 are almost the same size—about 75 percent larger than a Rodime, DataFrame, or MacBottom disk, and 3 inches deeper than the Macintosh that sits on them. Each has a light on the front that shows when the disk is being accessed, 50-pin SCSI connectors, and a fan in the back. The Plus-20 is more attractively packaged: it has a power switch that lights up when it’s turned on, as well as a push button for selecting the SCSI address—a far better approach than the Magic’s internal jumpers. The Magic20 is set to an address of 0 by default, which will cause problems with a Macintosh SE that has an internal hard disk (I didn’t test either drive with an SE). Both drives operate fairly quietly. The Plus-20 has a one-year warranty, while Magic’s lasts only six months.

Software
The software packaged with the drives distinguishes these two SCSI disks from each other. The Plus-20 comes bundled with some unusual utility programs: Peak Express, from ALSOft, for optimizing the disk (defragmentation), and a set of programs from MicroAnalyst for recovering lost files, patching copy-protected programs, and other such tasks. The package does not include a backup program or a security program. The formatting application has no provision for updating the driver on the hard disk without reformatting it and destroying data. Peak Systems does provide options for testing the disk for errors and for parking the drive heads in preparation for travel. One especially nice touch with the Plus-20 is that you can see the drive’s SCSI address when you select Get Info in the Finder.

The Magic20 comes with a good backup program, Dantz Software’s MegaCopy, and provides a way of updating the driver on the hard disk without destroying any data. However, there is no way to park the heads and no utility for testing the disk for errors. The only other application supplied is a public domain program by Billy Steinberg called Password. This provides some simple password checking at start-up, but is easily bypassed by a Mac expert.

Performance
The one serious problem I found with the two drives was their performance. I ran a series of tests, including Steve Brecher’s DiskTimer II test of raw performance and a test that timed the operation of duplicating a large (766K) file in the Finder. In both cases, the Plus-20 and the Magic20 took much longer than comparable 20MB hard disks, like the Apple HD-20SC. They looked even worse when compared to faster hard disks, such as the DataFrame 20XP and Apple’s Macintosh SE internal drive (see “On the Mark” and “Down to Basics”).

The Peak-20 and the Magic20 work as advertised, but they are not up to the level of their competition in the 20MB SCSI disk market. Utilities like disk optimizers, file-recovery programs, and backup programs can be purchased separately for a small additional outlay, but performance is not easily improved. I cannot recommend either of these disks when there are many others (the DataFrame, the MacBottom, and the Jasmine, for example) with much better performance and good utility software in the same price range. —Ric Ford

See Where to Buy for product details.
More Castle Hassles

**ShadowGate 1.0**

*Graphics and text fantasy game. Pros:*
Simple interface; increasing challenges; top-quality sound effects and graphics. *Cons: Script lacks flair and originality; games must be saved to third disk.*

**List price:** $49.95. **Requires:** 512K. **Copy protection:** Key disk.

ShadowGate is a fantasy adventure game set in the chambers and hidden recesses of a castle possessed by evil. Who, after all, would bother exploring a castle possessed by goodness? So much is jammed into these two disks that nearly everyone should find this game appealing, but players new to treacherous computer castles will enjoy ShadowGate best. The plot is tried and true. Rooms and tombs are visited, objects are examined, knowledge accumulates. It becomes clear that the Warlock Lord (he of the recurring evil laugh) can only be defeated by the Staff of Ages. If you've been this way before, you know the Staff couldn't possibly be in one piece. You've got to find the pieces, put the thing together, and finally, you get your showdown with the WL. This is the natural order of things.

**Effective Effects, Nothing Bizarre**

Although its graphics are top quality, I kept wishing the game would generate a few more chills with something totally new and bizarre. Admittedly, computer games aren't actually supposed to upset anyone, but good ones can be like network television—technically well produced but somewhat restrained. The most amusing treats in ShadowGate are for the ears. Various animations are enhanced by digitized real-sound effects that are better than the rudimentary sound effects of most games; among them the ringingly realistic shattering of glass, old WL's peals of evil laughter, sliding walls, magic effects, and a deadly drop through a trapdoor. Animation occurs briefly at essential and revealing moments—none of it, however, as elaborate and protracted as the animated musical presentation of the game's creators in "About ShadowGate." It's too bad that the sense of humor displayed there wasn't carried over to the game itself.

**Sight and Sound**

ShadowGate's graphics are expertly crafted but tend to lack originality. However, the accompanying sounds are far better than those of most adventure games.

**Keep the Torch Burning**

The mouse interface requires no typing; ShadowGate plays easily and instinctively. The most basic challenge quickly becomes obvious: you must keep a torch burning at all times in a dark castle, and the torches you find as you go vary in quality. The manual guides the player through the opening turns, and the first portion of the game is relatively easy, but its complexity increases. (Hint: Don't underestimate the long-term effects of the Wraith's Curse.) Although advanced players may find the challenges of the game routine, ShadowGate has two disks' worth of scope and is ultimately less of a pushover than the first hour or so may suggest to an experienced castle crawler. A hint book, available by mail order for $5, will probably do a good business.

If you've passed over something too quickly or have resumed a game and want to review the moves ending the last session, you'll appreciate the ability to scroll back the Text window approximately 20 lines (about the last ten actions), another helpful feature not present in all games.

Because the ShadowGate disks are completely loaded, they have no room for game storage. Prudent players store their games frequently, which means constant disk swapping. It's an inconvenience on a 512K Mac even with an external disk drive, much more so if you're attempting to play with only one drive. ShadowGate is also available for the SE and the Mac II, but as of this writing, a sound glitch exists in the Mac II version.

**Routine Superiority**

*ShadowGate* is technologically, visually, and aurally superior to most of its competition, but this reviewer still found something lacking. ShadowGate does not take itself seriously enough to create a mood of mystery that reaches beyond the gaming; it also lacks the tongue-in-cheekiness found in, for example, *Leather Goddesses of Phobos*. The excellence of the graphics and digitized sound ultimately do not compensate for the necessarily routine script. Newcomers are likely to derive genuine excitement from the game, although the essential quality of the production may still provide some enjoyment for experienced fans of the genre.—*Keith McCandless* 

See Where to Buy for product details.
Most online information networks can drain your resources faster than you can say "Vampire." Not with GEnie, the General Electric Network for Information Exchange. As part of the world's largest commercially available teleprocessing network of General Electric Information Services Company, GEnie won't bite into your budget.

Evenings, weekends, holidays. Just $5 per hour.

With GEnie, you can make friends, schedule meetings, gather facts and figures, set up travel reservations, get the news, be entertained, even shop for a fraction of what other information services charge.

And you get a lot more for your money.

With GEnie's Coffee MUG Round Table Special Interest Group you can discuss the latest in Macintosh products and accessories; download hundreds of public domain software programs, and participate in exciting and informative online conferences. And, uploads are FREE on GEnie!

There's more!

Meet friends old and new with GEnie's LiveWire CB simulator or exchange messages with electronic mail service. Schedule a trip with the online travel service. Fun and learning for the whole family with Grolier's electronic encyclopedia.

Play multiplayer and classic games in GEnie's Game Room. Get the latest in domestic and international computing news. All this and there's more to come. New services are being added each and every month!

With services and savings like these, now you can get more bytes online without incurring blood-curdling costs. Get online with GEnie. Sign up today!

4 Easy Steps:
1. Have your Visa, MasterCard or checking account number ready.
2. Set your modem for local echo (half duplex)—300 or 1200 baud.
3. Dial 1-800-638-8569. When connected, enter HHH.
4. At the #> prompt enter X/311851,GEnie then RETURN.

Need help or more information? No modem yet? We can help. Call 1-800-638-9636.

With services and savings like these, now you can get more bytes online without incurring blood-curdling costs. Get online with GEnie. Sign up today!
With Insight accounting software, you not only capture the numbers, you can interrogate them.
You need some serious cash by next Friday.

Can you get it in time from receivables?
Do some of your customers owe you a big chunk of money this week? If so, are they good for it?

If not, can you get it from the bank?
Your credit’s been okay, but how will they view this current problem?

Speaking of which, just what caused it? Or who?

With Insight, you’ll know. It’s the accounting software that not only keeps track of your numbers, but gets them to talk.

For example, Insight tells you who’s going to pay you and when—based on their actual payment history. So you’ll be dealing with realistic projections, instead of pie in the sky.

The Interpretation window compares your results with industry norms for service firms, manufacturers, distributors, etc. It flags potential problem areas and people responsible and suggests action you can take to improve your results.

The Definition window not only tells you what things mean (like "ratios") but also who’s watching them (like your banker) and what accounting and business factors affect them.

Insight goes on to define and analyze your financial information and suggests possible actions to take. For example, Insight lets you know that your current ratio—your short-term assets compared with liabilities—is good and getting better for a company like yours. Yes, you could use a loan. But because Insight makes it clear that your inventory is turning nicely, your banker knows he’s dealing with a temporary blip, not a lost cause.

Insight’s Accounts Receivable and Billing, General Ledger, and Accounts Payable packages are “packed with high-power capabilities guaranteed to satisfy any accountant’s inborn need to analyze,” says InfoWorld. “In fact, we haven’t seen any IBM® or PC packages ... this powerful.”

Insight’s innovative and unique capabilities have also impressed the world’s biggest accounting firm, Peat Marwick, who wrote the book on how to choose, implement, and make the most out of a small business accounting system. For a free copy of their book, as well as a free demonstration of Insight, call 1-800-262-6620 (or in Massachusetts, 617-423-9041) for the dealer nearest you.

And see what getting some real insight into your business is all about.

The Graph window shows you trends over the last 12 months of your key financial indicators, comparing them with last year’s and with industry norms.

The Interpretation window compares your results with industry norms for service firms, manufacturing, distributors, etc. It flags potential problem areas and people responsible and suggests action you can take to improve your results.

The Definition window not only tells you what things mean (like "ratios") but also who's watching them (like your banker), and what accounting and business factors affect them.

Insight goes on to define and analyze your financial information and suggests possible actions to take. For example, Insight lets you know that your current ratio—your short-term assets compared with liabilities—is good and getting better for a company like yours. Yes, you could use a loan. But because Insight makes it clear that your inventory is turning nicely, your banker knows he's dealing with a temporary blip, not a lost cause.

Insight’s Accounts Receivable and Billing, General Ledger, and Accounts Payable packages are “packed with high-power capabilities guaranteed to satisfy any accountant’s inborn need to analyze,” says InfoWorld. “In fact, we haven’t seen any IBM® or PC packages ... this powerful.”

Insight’s innovative and unique capabilities have also impressed the world’s biggest accounting firm, Peat Marwick, who wrote the book on how to choose, implement, and make the most out of a small business accounting system. For a free copy of their book, as well as a free demonstration of Insight, call 1-800-262-6620 (or in Massachusetts, 617-423-9041) for the dealer nearest you.

And see what getting some real insight into your business is all about.

The Graph window shows you trends over the last 12 months of your key financial indicators, comparing them with last year's and with industry norms.

The Interpretation window compares your results with industry norms for service firms, manufacturing, distributors, etc. It flags potential problem areas and people responsible and suggests action you can take to improve your results.

The Definition window not only tells you what things mean (like "ratios") but also who's watching them (like your banker), and what accounting and business factors affect them.
Can a pen plotter do this?

A lot of Macintosh™ CAD users are asking themselves this question. And for good reason. Pen plotters simply aren’t suited to produce the type of output required for 3D shading.

What’s the solution?

JDL’s new 850 GL+ is the only lowcost, A to C-size plotter to offer you practical 2D/3D drafting and 3D modeling hardcopy. The GL+ combines in one convenient desktop device: color, consistent line quality and accuracy, polygon fill patterns, HP-GL compatibility, automatic media feed and a host of other standard features to enhance your plotting productivity. And all at plot speeds up to ten times faster than pen plotters.

Don’t limit your options with a pen plotter. Meet the demands of today’s CAD hardcopy and be prepared for the next dimension.

Let the JDL-850 GL+ serve all your desktop engineering plotting needs. Call us for a brochure and plot sample now.

West: (805) 495-3451  East: (704) 541-6352
2801 Townsgate Road, Suite 104, Westlake Village, California 91361

Macintosh is a trademark of Apple Computer, Inc. HP-GL is a registered trademark of Hewlett-Packard Corporation.
VesaCAD drawing courtesy of VesaCAD Corporation.
Nationwide service by BRUNING

Circle 765 on reader service card
Attention computer and office supply buyers...

Free Buying Guide Helps You Save Big Money!

Now you can pocket important cash savings when buying computer supplies and office equipment. This new, eye-opening guide to supply sources and buying techniques will show you how.

The more you know about the computer supply and office products industry—the better and smarter you can buy. And buying smarter can save you hundreds (even thousands) of dollars a year.

This amazingly frank new booklet, "How to Save Money on Office Supplies," gives every office supply buyer valuable insights and facts and will help you get the best values when you buy anything from floppy disks to software.

Wouldn’t you like to know what types of suppliers make the most sense for your company? How to get the best prices without sacrificing quality and fast service? When to ask for special quotes? What to look for when buying certain products?

This information-packed booklet was written by our team of office supply experts. It includes helpful features on:

- How to get the best buys and avoid surprises on your invoice.
- How to avoid wasting money on "unused quality."
- Why some "discounts" don’t always mean lower costs for you.
- How to use your microcomputer more efficiently.
- Plus much, much more.

This booklet isn’t about Quill. Neither the company nor its policies or practices are even mentioned. Its only purpose is to help make you a better, more informed buyer. And that means you’ll learn money-saving tips and techniques, whether you add suppliers, change suppliers, or continue using your present sources.

To be really useful to you, a booklet like this could only be developed by experts in the computer supply and office products field who weren’t afraid to step on a few toes. Quill fills the bill on both counts.

We’ve been serving office supply buyers nationwide for more than 30 years...in all sizes of offices...in all kinds of businesses. We’ve become the nation’s largest independent office products distributor by constantly challenging industry traditions, finding ways to cut waste, and selling for less.

So if you’re really serious about saving money on your office and computer supplies, call 1-312-634-4800 or send for your free booklet today!

HERE’S JUST ONE EXAMPLE OF THE SAVINGS...

QUILL® SUPER BRIGHT-WHITE PRINTOUT PAPER

Cut 28% off our low regular price! Quill® 20-lb., bond bright white computer printout paper makes others seem grey by comparison. It’s certainly the brightest paper in its price range. Overall sheet size: 9½"x11" with ½" carrier strips. Micro-perforated edges tear off neatly leaving a smooth 8½x11" sheet. All 2500 sheets are continuous-form; guaranteed no breaks in this box or your money back. Sale ends 11/15/87.

453-S-7-10766 ...............Sale, Per Carton $22.88

BONUS OFFER!
FREE 6-month subscription to our microcomputer product sales book

Along with your FREE "How To" booklet, we’ll also include our current Quill Microcomputer and Word Processing Products bi-monthly sale book. Plus, in the months ahead, you’ll receive two more issues FREE. You’ll find the most popular computer supplies at industry-leading discount prices, plus hundreds of items at special monthly SALE prices. Start saving on all your microcomputer and word processing products right now. Simply return this coupon or call us at 1-312-634-4800!
Once again, ahead of the rest!

In the past 18 months, our programs have revolutionized the way you spell check your documents, cross reference your ideas, organize your thoughts and make notes to yourself. Now, with Canvas™ we are going to revolutionize the way you draw!

Canvas™ seamlessly integrates MacDraw™ objects, high resolution 300 to 2400 dpi (dot per inch) images, PostScript™ and MacPaint™ graphics in a single document. In features alone, Canvas™ is clearly superior. Yet, it's the way in which these elements work together that sets Canvas™ apart from all other graphics programs.

Whether it's a corporate slide presentation or a complex graphics design, Canvas™ helps you look your best. Graphs and charts produced by products like Excel™ and More™ can be customized in minutes. You can even create your own charts from scratch, up to 4 feet by 8 feet in size, using our pre-designed MacObjects™. And, with the desk accessory version of Canvas™ you can bring state of the art graphics to your favorite desktop publishing program or word processor.

In addition to supporting all the capabilities of MacDraw™ and MacPaint™, Canvas™ also includes the ability to view and edit your drawings in any magnification or reduction from 125% to 200%, "what you see is what you get" (WYSIWYG) text editing and powerful alignment and duplication commands for impressive special effects.

Visit your local dealer for a complete demonstration or call us at 1-800-6CANVAS.

In Florida call (305) 994-6965.

Canvas™ $195.00 (includes Canvas DA),
Canvas DA™ $99.95.

Deneba SOFTWARE

7855 NW 12th Street, Suite 202
Miami, FL 33126

Circle 761 on reader service card
New Products

Information on the Mac’s latest software, hardware, and accessories

Edited by Eileen Drapiza

New Products includes Macintosh products that have been formally announced but not yet evaluated by Macworld’s editors. All prices are suggested retail prices. Please call vendors directly for information on availability.

SOFTWARE

Business Simulator A game in which you become the CEO of an electronics company and guide it through start-up, growth, independence, new-product, and new-market phases. 512K minimum memory. $69.95. Reality Technologies, 215/387-6055.

Clients & Profits Complete agency-management system featuring estimating, job scheduling, job costing, and invoicing. 1MB minimum memory. $1895; Payroll module $495; General Ledger module $395; Multi-user Clients & Profits $2995. Working Computer, 619/483-1453.

Crystal Paint Graphics program for creating crystalline patterns. Includes the abilities to replay previously drawn images and to redraw strokes with different patterns. 512K minimum memory. $49.95. Great Wave Software, 408/438-1990.

Double Feature Collection of utility programs for E-Machines’ The Big Picture monitor, including 2X magnification and simultaneous use of Macintosh and The Big Picture monitors. 512KE minimum memory. Free from E-Machines dealers.

DS Backup Hard disk utility that enables you to back up and restore an entire hard disk, selected directories and files, or files that have been changed since the last backup session. Also prints out a report of files copied. 512K minimum memory. $79.95. Design Software, Inc., 312/231-4540.

Go A strategy board game designed to let users play matches against the computer, as well as against other players via modem. Competes at an 18Q level. 512K minimum memory. $39.95. Infinity Software, Ltd., 415/420-1551.

Hebrew CalendarMaker Generates Hebrew dates, weekly Torah portions, and Jewish holidays for any month of any year. Includes 15 pictures to be used in monthly calendar displays and a set of 24 Judaic icons for use on individual dates. 512K minimum memory; requires CalendarMaker from CE Software. $19.95, bundled with CalendarMaker $39.95. Davka Corp., 312/944-4070.

In-House Accountant Accounting software for consultants, sales representatives, small-business owners, and individuals with sophisticated personal finances. Features include full search and edit capabilities, selective text styling, 18 different financial formulas for business calculations, and context-sensitive help windows. Outputs activity reports, checks, invoices, aging reports, customer statements, pie charts, and bar graphs. 512K minimum memory. $149. Migent, Inc., 702/832-3700.

Linkware Mac Connection Works with host-based Linkware software to provide direct access to mainframe and minicomputer files. Allows Macintosh users to connect to IBM, DEC, HP, and UNIX host computers. 512K minimum memory. $300; information server pricing varies with host system type and configuration. Linkware Corp., 617/894-9330.

The Lurking Horror An interactive horror story in which you become a student at the George Underwood Edwards Institute of Technology. 128K minimum memory. $39.95. Infocom, 617/492-6000.

MacAPL An APL interpreter designed solely for Macintosh architecture. Features include picture variables that allow image processing, shared variables that allow communication between computers via AppleTalk network, multiuser shared file access with record locking, and access to ROM toolbox routines and machine code. 512K minimum memory. $125, demo disk $10. Leptonic Systems Co., 914/682-0377.


NSChart and NSPDL Language Translators Design and documentation aid for software engineers. NSChart automatically produces Nassi-Shneiderman (NS) flow diagrams from a program design language (PDL). Checks PDL syntax and text format. Provides a graphic symbol for each of the standard structured programming concepts and enforces the single-entry, single-exit basic structured design principle. 512K minimum memory. $450. Siltronix, 800/637-4888.

(continues)
Choosing a database manager is no easy task. It's by far the most confusing and fiercely competitive field in Mac software. But now your buying decision is crystal clear, because the editors of *MacUser* and the readers of *MACazine* have both selected OverVUE as the Best Database of the Year.

Said *MacUser* Jan. (1986), in selecting OverVUE for its Editors' Choice Award: “OverVUE 2.0 is a deceiving program in that the more you use it, the more you realize what it can do. Power, speed and logical menus make this a dream database.”

When *MACazine* (Jan. 1986) bestowed OverVUE with its Readers' Choice Award, they wrote: “We selected OverVUE because of its ease of use, clairvoyance and statistical capabilities. The fact that OverVUE was subsequently selected by our readers as Best Database simply confirms our original assessment: the product is a jewel and the customer support a bonus!”

OverVUE's clean sweep of these two prestigious awards only confirms what everyone else has been saying all along:

*Infoworld* (July 8, 1985): “…it is Macintosh software done right.”

*Icon Review* (Fall 1985): “OverVUE 2.0 is our favorite database workhorse… it simply offers the best balance of power and ease-of-use available on the market today.”

*Nibble Mac* (Oct. 1985): “OverVUE is not only easy to set up, it's the easiest for data entry. Its tools for entering repetitive data minimizes typing time.”

*Online Today* (electronic version—Nov. 1985): OverVUE 2.0 is a heavy-duty data management tool… it does all the things a good relational database manager should.”

OverVUE's features and power make it the ultimate database choice. Clearly, users and editors alike think OverVUE is something special. We think you will, too.

So visit your nearest software dealer and purchase your very own copy of OverVUE, the Best Database of the Year.

Write for information concerning our new Mail Management and Personal Finance Templates.

---

**New Products**

123Laser Plots Lotus 1-2-3 and Symphony graphs on an Apple LaserWriter or other PostScript output device. $99.95 per network. Carl A. Carlson, 415/322-4609.

**Personal Writer** Pen and tablet digitizer with software that learns your handwriting and enables you to input text without using the keyboard. 1MB minimum memory. Base $700-800. Anatek, Inc., 213/556-1628.

**Rainy Day Games** A three-in-one card-game package. Includes Concentration, Old Maid, and Go Fish. 512K minimum memory. $34.95. Baudville, 616/957-3036.

**Stationfall** Interactive fiction in which you are enlisted as a Lieutenant First Class on the paperwork task force of the Stellar Patrol and are put on assignment with Floyd the robot. 128K minimum memory. $39.95. Infocom, 617/492-6000.

**Time Scrolls** Entertainment database application that lets you print detailed information based on news events occurring since January 1, 1901. 512K minimum memory. $29.95. Accurate Computer Search, 619/726-7136.

**World Cup Soccer** Sports simulation game that lets users control the playing characteristics of their team to compete against other teams. Features include digitized sound and more than 400 frames of full 3-D animation. 512K minimum memory. $49.95. Infinity Software, Ltd., 415/420-1551.

**HARDWARE**

**Flip 40 Meg** A 40MB internal disk drive that weighs 1.2 lb and provides an average seek time of 28 milliseconds. Utilizes a Whitney-type head suspension with four heads and two disks. VLSI technology allows compact packaging and leaves room for Network Specialties screens and accelerator board. Network Specialties, 415/467-8411.

**Jump Board 020** An accelerator board with a 68020 microprocessor and an optional 68881 math coprocessor. Adds 2MB or 4MB of RAM and runs at either 12 or 16 MHz. $999. Network Specialties, 415/467-8411.

**MacDisk Series** Winchester SCSI disk drives available in preformatted capacities

(continues)
This is why IBM, NCR, HP, Compaq and Apple cholifk inopqf arnss flukp#rs skowt lijmo ont.

Circle 712 on reader service card
What's more, you can play "What's your stocks, commodities or indexes you'll retrieve and update signals for..."

The software is easy to use, amazingly precise, and very, very clear in its signals.

Amazingly Precise.

The Right Time™ programs run on IBM (and compatible), Apple II and Macintosh personal computers. The software is easy to use, amazingly precise, and very, very clear in its signals.

It's also fast. If you decide to download from Dow Jones with a modem, you'll retrieve and update signals for your stocks, commodities or indexes in less than five minutes per day. What's more, you can play "What If" games with individual stocks, commodities, indexes and options with results in about one second.

Results: Winning Trades.

There are three Right Time™ programs available to help you make the right decisions.

Stock Program: "The program is amazing. Profitable trades have developed out of nowhere!" M.C., brokerage firm vice president.

Index Program: "Computer whiz finds program for success. This program really works." A.G., financial columnist.

Futures Program: "Very profitable with four out of five winners. Paid for itself the first trade." B.L., investment advisor.

For More Information.

Call (213) 312-0154 today for a brochure, or place an order with a 30-day guarantee. Each program costs $399, any two $599, and all three $899.

New Products


MacPacq A portable data acquisition and control system that lets the Mac function as a digital oscilloscope, a chart recorder, and a waveform generator. MacPacq software provides a detailed graphic presentation of recorded and real-time data. Applications include physiological and environmental recording, process control and monitoring, and stimulus and acquisition problems. 512K minimum memory. $995. BioPac Systems, 805/968-8880.

Mac + PC An Intel 8086 add-on board that allows the Mac to run MS-DOS programs. Includes utilities for transferring data and files to and from the PC. Custom firmware allows DOS and Mac applications, folders, directories, and files to coexist on the same hard disk. Optional accessories include an IBM-compatible printer port, an RS-232C communications port, and an external IBM 3½-in. drive adapter. 512K minimum memory. $995. PerfeTek, 408/263-7757.

Ministreamer A nine-track, ½-in. reel-to-reel tape drive with an internal SCSI controller and Mac SCSI tape utility for transporting data between Macs and mainframes. $3995. Qualstar, 818/882-5822.

MS-300C 300-dpi intelligent image and text scanner. Choose from 8 halftone screen patterns (grain settings) and 15 brightness and contrast settings. Scan both halftones and line art in a single pass. Scale images down to 25 percent of original size. $1595; includes VersaScan Plus graphics software. Microtek Labs, Inc., 213/321-2121.

PenMac A non-magnetizing pen and tablet digitizer based on radio telemetry. PenMac software enables automatic magnification, translation, rotation, reduction, enlargements, reverses, and inversions. Provides resolution up to 1000 points per inch. Eight sizes available. Price varies depending upon model, $345 to $1095. Softweaver, 408/425-8700.

PowerPort and Power Accessory PowerPort connects to the disk drive port of either the Mac Plus or the Mac SE and provides

(continues)
This is why IBM, NCR, HP, Compaq and Apple chose 3M data cartridge tape backup.

The preceding page illustrates why the leading PC makers needed a reliable backup system for their computers.
And this page illustrates why they chose 3M data cartridge tape technology to be that backup system.
For 16 years, 3M has been delivering precise, error-free backup to cover yourself when data freezes up, disappears, or suddenly looks like a spilled bowl of alphabet soup.
And for 16 years, through every technological breakthrough, we've proven to be the best way to back up data.

Still not convinced you need it? Then turn back to the first page and imagine it was your annual report. Call (800) 423-3280 for a list of data cartridge drive manufacturers.

©3M 1987

Circle 712 on reader service card
Now Macworld puts a powerful new research tool right at your fingertips.

If you need instant access to news and information about your competition, your profession, technology, finance, law, or just about any other subject, Macworld's SearchLink will give it to you.

Macworld's new SearchLink service gives you easy access to more than 800 databases in just minutes!

And SearchLink gets you answers to all sorts of questions from these databases—like details about new products and services, or market facts, or emerging technologies. You can get information on computers, medicine, investments, law, chemistry, engineering and much more. Everything from accounting to trademarks to history or geography.

SearchLink is easy to use and inexpensive.

All you need is a credit card and a computer with modem. No subscriptions. No passwords. No difficult manuals to learn. Just call 800-843-7337 with your computer and log on. You pay only $7.99 per search (a few databases carry surcharges) plus 25 cents per minute for telecommunications and $2 for each abstract you want to see. (You can also get hard copies). You can charge everything to MasterCard, VISA, or American Express.

SearchLink provides 24-hour online assistance.

SearchLink even gives you free on-line tips from trained SearchLink search specialists if you have problems or questions about your searching. Just type "SOS" when you're on-line!

SearchLink gets you to the information you want.

If you've ever wanted to access databases offered by ADP Network Services; BRS; Data-Star; Datasonic; DataTimes; Dialog; G-Cam Serveur; NewsNet; Pergamon InfoLine; SDC; Questel; or VU/TEXT, SearchLink will access databases from all of them—without a special subscription or knowledge of special search languages.

We can't list all of SearchLink's more than 800 databases, but just to give you an idea, here are some of the databases available under the topic "COMPUTER."*

<table>
<thead>
<tr>
<th>Database</th>
<th>Software Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Software</td>
<td>Menu-The International</td>
</tr>
<tr>
<td>Computer Database</td>
<td>Microcomputer Index</td>
</tr>
<tr>
<td>COMPUTERPAT</td>
<td>Online Microcomputer</td>
</tr>
<tr>
<td>INSPEC</td>
<td>Software</td>
</tr>
<tr>
<td>SUPERTECH</td>
<td></td>
</tr>
</tbody>
</table>

And here are just a few of the other popular databases you can access with SearchLink.

- ABI/INFORM
- Chemical Abstracts
- Disclosure
- (Selected databases)
- Donnelley Demographics
- Dun & Bradstreet
- (Selected databases)
- ERIC
- PTS PROMT
- TRINET
- Trademarksscan
- Standard and Poor's
- Corporate Descriptions

Call 800-843-7337 now!

Put the power of knowledge to work for you right now. Call 800-843-7337 (THE-SEER) on your computer and get the answers you need to stay ahead.

* A complete list of the databases is available on SearchLink.

SearchLink is sponsored by the National Federation of Abstracting and Information Services (NFAIS) and is a professional association of database producers.
Having a computer doesn’t mean much if you don’t know what to do with it.

Nothing is carved in stone in the computer business. Every time you turn around, there’s a new hardware upgrade, a new software update, a new arena of productivity. Do you need it? How do you choose it? How do you use it?

PC WORLD clarifies the issues for you. Having the tools is not enough. Our experts explain how to use them for your purposes. Business specialists in your field provide in-depth, comparative reviews so you make informed decisions. You get smart, practical solutions so you make the most of your equipment.

PC WORLD meets the computer challenge for you. And you can carve that in stone.

PC WORLD, The Business Magazine of PC Products and Solutions.
New Products

connectors for a disk drive and another peripheral. Power Accessory is a similar device for the Mac II. PowerPort $29.


ScripTen A laser printer that offers collated output and prints 10 pages per minute with print resolution of 300 dpi. Operates both in PostScript mode and as an emulation of the HP LaserJet Plus printer. Available in 2MB or 3MB configurations. 512K minimum memory. 2MB model $4795, 3MB model $5295. Qume Corp., 800/223-2479.

Stretch Screen, Baby Stretch, Reach Overhead Stretch Screen is a 19-in. monitor with resolution of 1024 by 932 pixels and 80 dpi. Clip-on video board allows for user installation. Compatible with Macs from 128K to the SE. Baby Stretch is a 15-in. full-page display with resolution of 720 by 900 pixels and 90 dpi. Reach Overhead is a 640- by 400-pixel display screen used with an overhead projector; connects directly to any Mac and permits interactive display of Mac documents and programs. Stretch Screen $1849, Baby Stretch $1699, Reach Overhead $1799. Network Specialties, 415/467-8411.

TrueForm System Scanner and software system for filling out forms. The Image Scanner transmits a form's image to the Mac screen, then allows you to fill it out or train the computer to do it. Prints the entire form complete with data, or prints data on preprinted forms. 1MB minimum memory: $1995. Spectrum Digital Systems, 608/244-4300.

ACCESSORIES

Command Center Plus Multipurpose switching system that gives push-button control of up to five devices, such as computers, monitors, printers, and modems. Also protects communications equipment against damage due to electrical and phone line surges, electromagnetic and radio frequency interference, and static electricity: $139.95. Curtis Manufacturing Co., Inc., 615/924-3821.

FloppiClene Upgrade Kit For FloppiClene owners who have upgraded from single-sided to double-sided disk drives. Consists of one 3¼-in. cartridge and five 3¼-in. cleaning disks. $10. Tech-sa-port, 412/661-2629.


To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.

BRING YOUR MOUSE UP TO SPEED

FAST PAD™

Fast Pad's finely textured, low friction surface gives you incredibly quick, pixel by pixel control without annoying skips. Boosts the performance of any mouse, including ones with new teflon bottom. Wipes clean and maintains its finish for years.
Apple® Platinum, Blue and Dark Grey.

Apple is a registered trademark of Apple Computer Inc.

MicroStore™ Crafted with Pride in U.S.A.
P.O. Box 33 LeSueur, MN 56058 U.S.A.
Custom colors & logo imprints available.
Prices do not include shipping.

BOOKSHELF TO BRIEFCASE

SAFE, CONVENIENT, EASY-TO-FIND DISK STORAGE
disk-book.

Free-standing design and individual pockets let you view all titles at a glance. Unique top seal keeps disks in—dust out. 10, 16 and 32 disk models (16 has pockets for manuals, pads and pens.)

Traveller™

Slim, compact travelling companions fit easily in coat pocket or purse. Folding design securely holds and protects disks, 4, 8 and 12 disk models.

Disk books and Travellers are crafted of stain and static resistant Cordura nylon fabrics, with reinforced edging for durability. Snap-free pockets—secure velcro closure—four popular colors.

FOR FAST DELIVERY
CALL NAT. TOLL FREE: 1-800-962-8885
In MN (612) 665-3284 Telex 325853
Master Card, Visa, American Express Accepted

Circle 786 on reader service card
USE THE BRAINS YOUR APPLE WASN'T BORN WITH.

Right at your fingertips in CompuServe's Apple® Forums.

Our Apple Forums involve thousands of users worldwide who will show you just how easy it is to get the most from your Apple or Macintosh®.

Join the CompuServe Apple II and III Forum and explore thousands of classic programs. Try our Macintosh Users Forum for information on peripherals, music, graphics, and user-supported software. Check out the Apple Developers Forum to find out about desk-top publishing and business. And through the Apple User Groups Forum, you can meet officers of Apple organizations from around the world.

Easy access to free software, including free uploads.

Download first-rate, non-commercial software and utility programs. Upload your own programs free of connect time charges. And take advantage of CompuServe's inexpensive weeknight and weekend rates, when forums are most active and standard online charges are just 10¢ a minute. You can go online in most areas with a local phone call. Plus, you'll receive a $25.00 Introductory Usage Credit when you purchase your CompuServe Subscription Kit.

Information you just can't find anywhere else.

Use the Forum Message Board to send and receive electronic messages. Join ongoing, real-time discussions in a Forum Conference or communicate with industry and Apple experts. Search Forum Data Libraries for non-commercial software. Enjoy other useful services too, like electronic editions of popular computer magazines.

All you need is your Apple computer (or almost any other personal computer) and a modem.

To buy your Subscription Kit, see your nearest computer dealer. Suggested retail price is $39.95. To receive our free brochure, or to order direct, call 800-848-8199 (in Ohio and Canada, call 614-457-0802). If you're already a CompuServe subscriber, type GO MAUG® (Micronetworked Apple Users Group) at any prompt and see what you've been missing.

CompuServe® Information Services, P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, Ohio 43220
800-848-8199
In Ohio, call 614-457-0802
An H&R Block Company

Circle 330 on reader service card
Everything you need for a great presentation.
Introducing PowerPoint™

Now you can put together the kind of presentations you've always wanted. Quickly. Easily.

Complete, professional presentations, whether it's for an unexpected sales meeting in 10 minutes, or the annual shareholders' meeting in a month.

With PowerPoint, you actually plan, compose and edit your entire presentation on your Macintosh® computer. So you see exactly what you, and your audience, are going to see.

PowerPoint is the only presentation package that gives you everything you could want, the way you want it — overheads, slides or flipcharts, plus speaker's notes and audience handouts.

It's like having an entire staff of writers, designers, typesetters, artists and a print shop all to yourself. But without the hassles and headaches.

With PowerPoint's free-form design capabilities, you can easily create everything on your screen, no artistic talent required. Mix typeset-quality text with diagrams, graphs and illustrations. Or, you can copy charts, tables and illustrations from other programs just as easily.

Once you've decided on the "look" you want — big logos, thin borders, today's date, whatever — PowerPoint can standardize that format for all your other visuals, automatically.

And with PowerPoint's unique Slide Sorters, you can quickly rearrange your slides or combine them with slides from other presentations, automatically reformatting them to your new look.

Last minute changes? No problem. You can make them in an instant with PowerPoint. Now you're ready to simply print out your notes, handouts, overheads or flipcharts.

Then take a deep breath, pour yourself a glass of water, and you're set to wow 'em!

Because for just $395, you have the only program that gives you everything you need to make your points, powerfully.

Call 1-800-622-9273 today for the name of your nearest dealer.

We guarantee it.
If PowerPoint doesn't completely fulfill your expectations, call us and we'll solve your problem or arrange a refund.* From Forethought, Inc.

© 1987 Forethought, Inc. Forethought and PowerPoint are trademarks of Forethought, Inc. Macintosh is a trademark of Apple Computer, Inc. *Refund must be requested within 30 days of purchase.

Circle 289 on reader service card
Levco's Prodigy SE transforms your Macintosh SE into a high-performance workstation capable of running software up to 100 times faster. By boosting the speed of Macintosh applications, the Prodigy SE will save you thousands of hours and dollars. Prodigy SE plugs into the Macintosh SE's internal expansion bus, and features specialized hardware options.

68020 processor boosts software speed
Prodigy SE's true 32-bit, 16 MHz 68020 processor effectively doubles the clock speed and data path of the Macintosh SE. Standard applications run 4-8 times faster, revolutionizing the productivity of desktop publishers, consultants and business users.

Math co-processor crunches numbers faster
Calculation-intensive software runs up to 100 times faster with the optional 68881 math coprocessor, creating an ideal workstation for data analysis, CAD/CAM, software development and desktop engineering.

Expandable RAM and Memory Management
Prodigy SE features one megabyte of RAM, and is expandable to 32 megabytes. The optional 68851 paged Memory Management unit provides the Macintosh with virtual memory capabilities previously available only on mini or mainframe computers.

The complete system from a single source
As an authorized Apple® VAR, Levco provides completely bundled Macintosh systems, authorized Apple service and product warranty.

Levco
6160 Lusk Blvd.
Suite C-203
San Diego, CA 92121
(619) 457-2011

Circle 493 on reader service card
**Quick Tips**

*Answers to your questions*

by Lon Poole

First, an update on the international scene. Apple has always recommended against using a U.S.-model ImageWriter II or LaserWriter with 50-Hz electrical power, which is common throughout the world outside North America. I echoed that advice in the March 1987 *Quick Tips*. Reader Richard O'Regan reports that he and others in Switzerland have been using those printers for months with 50-Hz power without trouble. Pam Miracle, Apple spokesperson, says Apple engineers have now tested the ImageWriter II enough to OK its use with 50-Hz power. You still need a 220-volt to 110-volt grounded isolation transformer (available from electronics supply stores).

The Apple engineers are not ready to bless the U.S. LaserWriter for 50-Hz use. Its fuser/heater element is frequency-dependent and may overheat after long sessions on 50-Hz power. A thermal sensor and a backup thermal sensor inside the LaserWriter detect overheating and shut the printer down if it gets too hot. You can probably get away with light-duty use of a U.S. LaserWriter outside North America, especially if you don’t leave it on continuously. But for long-term, heavy-duty use overseas, you should sell your domestic model and get a 220-volt 50-Hz LaserWriter.

**Better BASIC Rounding**

April’s *Quick Tips* presented a BASIC function for rounding a numeric value to a specified number of decimal places. Several readers have suggested the following simpler function definition:

```basic
DEF FNROUND(value,places) =
   CINT(value*10^places)/10^places
```

This formula, like the original, works for most values, but not for some negative values. For example, it rounds -6.45 to one decimal place as -6.4. Bernd Stiecker, of Morsbach, West Germany, suggests this function definition when values to be rounded may be negative:

```basic
DEF FNROUND(value,places) =
   SGN(value)*INT(ABS(value)*
   10^places + 0.5)/10^places
```

**Q Degrees, Minutes, and Seconds in BASIC**

I am writing a surveying program using Microsoft BASIC. Surveying instruments measure angles in degrees, minutes, and seconds. I need to convert these measurements to decimal numbers. Is there a known formula for this?

Ron Bonbom
Lost City, West Virginia

A The following formula converts degrees, minutes, and seconds to a decimal number:

```basic
   angle = degrees + minutes/60 + seconds/3600
```

To convert back, use these formulas:

```basic
   degrees = INT(angle)
   minutes = INT((angle-degrees)*60)
   seconds = INT((angle-degrees-minutes/60)*3600)
```

**Q PostScript in Word 3.0**

Now that a Microsoft Word 3.0 document can include PostScript programs, I have begun rummaging through old issues of *Macworld* and Adobe’s *Colophon* newsletter for sample PostScript programs. I found a text rotation program in the February 1985 issue of *Macworld*, but cannot get it to work in a Word 3.0 document.

Craig R. Hanna
Sun Valley, California

A The PostScript program you mentioned requires a few changes before it will work in Word 3.0. The program can also be simplified. See "PostScript in Word" for the revised program listing and "PostScript Text Rotation" for the output the program prints.

The first line of the program defines a macro—*inches*—that converts inches to points. The next two lines set the initial text rotation at 90 degrees (vertical) and the gray level at 0.9 (10 percent gray).

Next the program defines another macro, *rotationloop*. The macro uses a *gsave* operator to save the current graphics state. In the new graphics state, a *moveto* operator places the pen at the lower-left corner of the drawing area, *rotate* and *setgray* operators set the current rotation angle and gray level, and a *show* operator draws the word *Rosebud*. Then sub

(continues)

**PostScript Text Rotation**

PostScript makes it easy to experiment with special effects like text rotation. The text in this rotating sequence is 82.5-point *Times Bold Italic*. The gray level starts at 10 percent and darkens 15 percent for each line. The rotation angle ranges from 90 degrees to 0 degrees in 22.5-degree increments.
YOUR MOST COMPACT BACKUP SOLUTION

RELIABLE Get the security you need by storing in a low noise, triple shielded Data File. Our high quality low noise fan and heat sink case reduces VLSI hot spots and promotes long life. Data File's superior hardware/software with complete error correction capability gives you unsurpassed reliability.

VERSATILE Data File's compact size allows operation on top, next to or under your Macintosh. Even small enough to fit inside your briefcase. Functional in either 110V or 220V modes. Data File allows you the convenience of operation anywhere in the world.

FRIENDLY The newest in archival software provides volume backup and restore for file by file from any volume to any other volume. Data File works like a hard disk you are familiar with. Simple and easy to use. Data File ends the hassle of swapping diskettes.

NuDATA 3206 Scott Blvd. Santa Clara, CA 95054 (408) 727-1049 (800) 8-DATA-NU

Media Winchester Ltd. Scotts Valley, CA (800) 824-7386 CA

Statewide Electronics Lombard, Illinois (800) 882-8311 (312) 932-5650

Tech South Inc. A Dell South Company Tucker, Georgia (404) 939-9379

Circle 737 on reader service card
THE MEMORY THAT ROARS
YOUR TRUE GIGABYTE MASS MEMORY SOLUTION

NuDATA
3006 Scott Blvd.
Santa Clara, CA 95054
(408) 727-1049
(800) 8-DATA-NU

Available at:
Heath/Zenith Computers & Electronics Centers

Statewide Electronics
Lombard, Illinois
(800) 882-8311
(312) 932-5650

Tech South Inc.
A Bell South Company
Tucker, Georgia
(404) 939-9379

Circle 736 on reader service card
MiniCad™
Let Others Speak for Us

Computer Graphics:
"MiniCad even beats AutoCAD. It combines 2D and 3D features in one package, a sophisticated 2D and 3D drafting program that is clearly intended for the professional CAD user."

CAD/CAM Journal:
"A major contender in the Macintosh CAD marketplace. MiniCad offers enormous functions for the price."

Graphic Perspective:
"MiniCad...is a wonderful example of one of those pieces of software that slips onto the scene unannounced, quietly surpassing all similar programs that break in on the market with a huge splash."

Personal Publishing:
"MiniCad bridges the gap between everyday drawing applications and professional CAD programs, and it combines the best of both."

MacWorld:
"MiniCad achieves an ideal balance of simplicity and capability. Don't let the name fool you...there is nothing "mini" about MiniCad except the price."

Priced at only $495.00
MiniCad™
is developed and produced by
Diehl Graphsoft Inc.
8370 Court Ave.
Suite 202 Ellicott City, Md. 21043
301-461-9488

How To/Quick Tips

PostScript in Word
You can include PostScript programs in Microsoft Word, 3.0 documents. They appear on screen as 10-point Normal bold hidden text. This example rotates text as shown in "PostScript Text Rotation."

operators decrease the rotation angle 22.5 degrees and darken the gray level 15 percent. The macro ends by restoring the graphics state to its previous condition with a grestore operator.

With definitions and initializations done, the program sets the font to Times Roman Bold Italic, 82.5 points, using the findfont, scalefont, and setfont operators. Then a gsave operator saves the current graphics state. In the new graphics state, a translate operator moves the lower-left corner of the drawing area 2 inches to the right and 3 inches above the absolute lower-left corner of the page. Finally, a repeat operator repeats the rotationloop macro five times and a grestore operator restores the graphics state to its previous condition.

When you type the PostScript program, you can freely intersperse blank lines and blank spaces for better readability. But do not use Tabs or the program won't work.

After typing the program, you must format it in Word's standard PostScript style. Simply select the entire program, press Option-Shift-S, type the word PostScript, and press Return. Be sure you format the whole program, including blank lines. You can put graphics or non-PostScript text before or after the program, but not in it.

According to Beck-Tech, the symptoms you describe are rare. Some fan motors have a magnetic field strong enough to interfere with the picture tube's magnetic field, resulting in screen jitters. The Fanny Mac has a one-year warranty, and Beck-Tech will fix or replace any unit that causes problems during the warranty period.

If your Fanny Mac is out of warranty, you can fix the problem by placing a piece of mu (pronounced meu) metal, which is an adhesive-backed, flexible aluminum-nickel alloy, inside the Fanny Mac case. You can get mu metal from some electronics parts stores. Contact Beck-Tech for assistance (41 Tunnel Road, Berkeley, CA 94705, 415/548-4054).

Unwanted LaserWriter Help
Each time we turn on the LaserWriter, it prints a status sheet, and each time we choose Manual Feed for the LaserWriter, it prints a sheet of manual feed instructions. We no longer need these instructions. Is there any way to prevent this waste of paper and toner?

Land Design
Salt Lake City, Utah

You have old versions of the LaserWriter and Laser Prep files in your System Folder. The manual feed instructions were removed more than a year ago. You should be able to get the latest LaserWriter, Laser Prep, System Finder, and other System files from your Apple dealer. Or

(continues)
INTRODUCING 101 MACROS™ FOR EXCEL™

Instead of This...

MAKE EXCEL EASIER — AND MORE POWERFUL
Now you can have your own on-disk library of shortcuts, utilities, keystroke savers and mousestroke savers that will work with ANY Excel worksheet. No more dull, repetitive operations, no more pulling down and clicking through multiple menus, no more hours wasted with manual input that could be automated.

Introducing the ultimate collection of 101 pre-typed, ready-to-use, all purpose macros on disk. Imagine being able to:

- Automatically double space and print a worksheet
- Set up and maintain data bases with a single command
- Create slide show presentations
- Add menu-driven financial functions
- Automatically overlay and clean up all the worksheets on the screen with a single keystroke

... Plus 96 more features to save time and multiply the power and ease-of-use of Excel.

With 101 MACROS FOR EXCEL you can save keystrokes & mousestrokes, save menu steps, save time and automate your worksheet. With through complicated menus and worksheet setups with a single keystroke. Eliminate repetitive operations with macros that will move down columns or across cells, changing each cell to your specifications. Operations that previously required several mousestrokes, like scanning columns or inserting rows, can now be done with single keystrokes.

With This. $69.95 Sugg. Retail

ELIMINATE FRUSTRATION
How many times have you had to go back to the manual to learn how to do some simple function that seems overly complicated in Excel? How often have you waded through charting, database operations and building tables? How often have you wished that you didn’t have to wear out your arm reaching for the mouse to perform just about every operation? The macros in 101 MACROS FOR EXCEL help you out with everything from simple mousestroke and keystroke savers, to sophisticated, interactive macros which “walk you through” more complicated Excel operations.

EASY TO USE
These macros are extremely easy to use. Just load the macro sheet called 101 into Excel and you'll have all 101 macros available for instant use at any time.

By pressing the option key, the command key and a single letter you can insert new rows that copy data automatically. Or enter long phrases instantly. You can even toggle the gridlines and headings on and off with a single keystroke combination.

EASY TO LEARN
101 MACROS FOR EXCEL comes complete with a comprehensive, step-by-step manual that includes a short tutorial chapter and explains each of the macros and how to use them. The macros are fully documented, so they’re easy to review, change and learn from — which gives you an excellent starting point for writing your own custom macros.

FREE! HANDY REFERENCE GUIDE
Act now. For a limited time you get not only a complete collection of 101 macros with User’s Manual, you will also receive a handy reference guide listing all 101 macros and their call-up keystrokes.

“Outstanding ... the ultimate macro library.”  
— R. Antonias, President, Solar Systems Software

“A must-have for Excel users.”  
— E. Sharp, President, Clarity Glass Inc.

“A great idea ... what a timesaver!”  
— J. Stein, President, Studio Sillicon

ORDER 101 MACROS FOR EXCEL today!

NOT COPY PROTECTED
60-DAY MONEY BACK GUARANTEE
CHECK YOUR LOCAL DEALER

MACROPAC INTERNATIONAL
16655 Stevens Creek Blvd., Suite 100 • Cupertino, CA 95014
1-800-624-0077 or 1-800-832-7766 (in CA)

Circle 653 on reader service card
BACK UP PROTECTED SOFTWARE.
Copy II has the built-in power and flexibility to handle most protection schemes—automatically!

GIVE YOUR MAC MORE MUSCLE.
Copy II includes MacTools. This comprehensive set of utilities can repair some damaged disks and Version 7's more powerful undelete can often recover the file name, type and creator and even works with hard disks.

FULLY supports any Macintosh with 512K memory, H.F.S., M.F.S., 400K & 800K disks, 1 or 2 drives, hard disks and all available memory.

Registered owners may update for $15 plus $3 s/h. Backup utilities also available for IBM, Apple II, Atari ST and Commodore 64/128.

EVEN RUNS SOME PROTECTED SOFTWARE FROM YOUR HARD DISK.
Our Copy II Hard Disk feature lets you copy some of the most popular business software from a 400K to an 800K disk or direct to your hard disk! Call for current list.

CALL 503/244-5782 in hand. Or send a check for $39.95 U.S. plus $3 s/h, $6 overseas. $39.95

Central Point Software
INCORPORATED
9700 SW. Capitol Hwy., #100
Portland, OR 97219

NOW! 800K drives for Macintosh: $225 (plus $10 s/h). Plugs directly into Mac 512c & Mac Plus!

Circle 607 on reader service card

How To/Quick Tips

Disk-Drive Head Parking
There is much confusion about hard-disk head parking. Every manufacturer seems to have a different opinion about how it should be handled. The original documentation for my SuperMac DriveFrame advised me that the Shut Down command would park the heads on an unused sector of the disk. Recently, I received SuperMac's SuperParker program, which SuperMac now advises using before moving the drive. What is head parking? Does the Shut Down command park the heads or not?

I recently bought a Macintosh SE with an internal hard disk. Its documentation says nothing about head parking, advising only that canvas cases made for older Macintoshes are probably not sufficient protection for moving my machine. Is the Mac now so business-oriented that it should not leave the office? What about the seat of my car, with the safety belt buckled? Should I affix a Computer on Board sign in the rear window of my car?

Serge Froment
Ville St-Laurent, Quebec
Canada

Parking the heads moves the read/write heads to a safe area and locks them there when you switch the drive off. This protects the disk surface, and the programs and data recorded on it, from accidental damage during transit.

The Shut Down command lifts the heads away from the disk surface, providing partial protection. However, it does not move them away from the program/data area of the disk. A sudden shock could bring the heads into contact with the disk, destroying programs, data, and the heads.

You may wonder why hard disk drives don't automatically park their heads. Some do. It takes an extra 30 seconds or so to start up from a drive with parked heads, though, because the drive must recalibrate the heads. Automatic head parking is especially worthwhile if you move your drive often.

(continues)
The APL® PLUS System
Because it's a language you can think in!

"I bought the APL® PLUS System to solve analytical problems. Now I'm using it to build models, write programs, and even develop applications!"

The APL® PLUS System is the most flexible problem solving tool available for the Macintosh™. It combines a powerful APL language interpreter with your favorite Macintosh features to step up your problem solving and programming power.

Increase productivity with powerful concise notation
Concentrate on what you're doing—not how you're doing it. At the heart of the APL® PLUS System is a set of easy to use symbols that condense complex operations into a few simple keystrokes. One symbol can sort an array, invert a matrix, search for a string, or add up a table of numbers. And, the same command will work with small or large blocks of data. With its concise and compact notation, you'll solve problems as fast as you can think about them.

A flexible environment for handling data
The APL® PLUS System's unique analytical capabilities and natural mathematical orientation make it a popular choice for solving complex business problems. STSC builds in the quality extras that make APL work best with your Macintosh. Included are over 100 additional language enhancements for greater power and speed, and a library of tutorial and utility workspaces. Built-in terminal emulation with upload/download capabilities make it easy to move data and programs to and from other micros, minis, and mainframes. Full support is provided for the ImageWriter™ and LaserWriter™ printers, and you'll enjoy standard Macintosh features such as QuickDraw graphics, dialog boxes, cut-and-paste full-screen editing, plus common desk accessories, all within APL.

Put the power, speed, and flexibility of the APL® PLUS System to work for you today for only $395! See your local dealer or call STSC at 1-800-592-0050, ext. 700 (in Maryland or outside the U.S. call 301-984-5123).

To test-drive the APL® PLUS System, order our demo disk today. Send a check or money order for $10.00 to STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852.

STSC, Inc.
2115 East Jefferson Street
Rockville, Maryland 20852

Available through Softsel, Micro Central, and distributors worldwide. APL® PLUS is a service mark and trademark of STSC, Inc. APLUSWARE™ is a trademark of STSC, Inc. Macintosh is a trademark licensed by Apple Computer, Inc. ImageWriter and LaserWriter are trademarks of Apple Computer, Inc.

Circle 635 on reader service card
If you can park the heads on your hard disk drive before moving it, by all means do so. If you can't, then take extra care that the drive or the Mac (if it's an internal drive) won't fall over, bounce around, or get knocked about during transit. The front seat of your car is a poor spot for your Mac SE, unless you do buckle it up. For extra insurance, before transporting your hard disk you should make sure you have an up-to-date backup of important files.

### Name Too Long for Trash?

Dropping a disk icon into the Trash is a fast way to eject the disk and eliminate its icon from the desktop, until you encounter a disk with a long title. It seems that the Trash Can has a very narrow opening, and the Trash Can is too close to the right edge of the screen to accept long-winded disk or document names. It is a simple matter to move the Trash icon to the left before using it, but I find I must do this again and again, every time I return to the Finder. This is definitely user-unfriendly.

Using ResEdit, it is easy to find the Trash icon in the Finder, but the icon's initial desktop location seems to be buried. Can you help?

Vanya Matzek
Cupertino, California

**Q** Name Too Long for Trash?

**A** You don't need ResEdit for this one. If an icon's outline hits the right edge of the screen and stops moving, don't stop dragging it toward the Trash Can. Keep pressing the mouse button and moving the pointer--ignore the icon outline. When the pointer reaches the Trash, the Trash icon is highlighted (see "Trashing Long Names"). Release the mouse button, and the icon you were dragging goes into the Trash.

### The Plague of jClock

**Tip:** When I first found jClock by James T. Sulzen, I was impressed. I was fed up with the work required to view the Alarm Clock and was pleased to find a program that would put a clock in a continually viewable location—the menu bar. However, its presence seems to result in system errors; other users have reported the same.

You can remove jClock simply by dragging its icon to the Trash. You must also recopy the System file from a disk that doesn't have jClock installed. Or, if your

---

**HOT NEW PROGRAMS!**

**Editor's Choices**

- All on one disk—12 top-rated programs from MacWorld!
- Featured in July ’87 Issue of MacWorld
- Four Star Rated in MacUser

**Business**
- 76 PageMaker—49 templates for cards, letters, mailing envelopes...
- 135 Best of Business & Home Finance...

**Communication**
- 125 Work Station—Setup BBS (hard disk recommended, shareware)
- 102 Best of Disk—BBS, bulletin services...
- 132 Mac's Headroom: 27 disk fonts, demos, docs...

**Fonts**
- 90 Boston II—letter quality on Imprinter
- 133 Beverly Hill—Sharpest, Imprinter U/L...

**Games**
- 103 Best Games—Billiards, Megadisc...
- 129 Star Trek—funny adventure
- 128 Challenge race—1000 miles, plus more games
- 129 Road to Zero Gravity: graphics, sounds...
- 134 Wheel of Fortune: digitized sounds...

**Graphics**
- 116,117 Clipper, Slideshow Wizard...
- 130 MacDraw/Macposter millions of lines...
- 144 VideoWorks movies, player docs...
- 151 AstroPro—MacPoint-like DA...

**Nudes**
- 49 Giant Nudes only pictures...
- 66 MacNudes digitized photos...

**Programming**
- 51.52,53 Medusa2 language wico...
- 154 Earsids—draw detailed 3D gobles...

**Utilities**
- 5 Code Cracking widow, F.E.A.T.
- 6,99 ResEdit edit fonts & icons, wico...
- 187 BASIC Compiler...
- 130 Disk Cataloger—organize disks...
- 113 New Pack.1,2 RAMdisk, Hard Disk backup (Plex only)...•
- Library: Complete set—150 disks...

**SPECIAL OFFER!**

Any 5 Disks + Book + Bulletin
ONLY $39.95 ($44.50)

Add $5 ($10 foreign) for shipping & handling or $2 ($5 foreign) if ordering book only. CA orders add sales tax. Please send... by...

Signature

Address

City

State

Zip

TO THE PUBLIC DOMAIN EXCHANGE CALL

2074C W ash Ave., Dept. 110
800-331-8125
Santa Clara, CA 95050
In CA: 408-965-0454

Circle 334 on reader service card

---

**WHEN LASERWRITER'S AREN'T GOOD ENOUGH...**

**Call Graphics Plus!**


**Featuring the Linotronic L300**

- Resolution up to 2540 dpi.
- Positive or Negative film output available.
- Complete Adobe typeface library.
- Toll free Modem available 24 hours.
- Complete compatibility with IBM and Apple.
- Same day turn-around in most cases.
- Training available.
- MasterCard or Visa accepted.

**ONLY SETTLE FOR THE BEST**

**GRAPHICS PLUS**

3710 S. ROBERTSON BLVD., SUITE 216
CULVER CITY, CA 90232
(213) 559-3732 (Inside California) (800) 225-0486 (Outside California)

Circle 766 on reader service card
Get Back to Basics™

Peachtree's Back to Basics is the most popular accounting system on the market today. And it's no wonder why.

Back to Basics is simple to install, easy to use, and priced in line with what small businesses can afford.

But don't take our word for it. Software Digest, a leading consumer organization, rated Back to Basics number one in overall usability when compared to products costing as much as $995 and, for the past two years, Back to Basics has won the A+ Magazine Software of the Year Award for Macintosh business accounting systems thanks to the votes of over 20,000 Apple users.

No Experience Required

Back to Basics assumes you're an expert in only one business—your own.

- Installation of Back to Basics is painless — read only seven pages in the manual and spend 30 minutes using our screen menus.
- If you need to brush up on your accounting, use our accounting primer and tutorial, written by Harvard Business School Professor, Robert N. Anthony, plus our business section on how to handle everyday accounting dilemmas.

$199

Back to Basics Accounting System became a best seller priced at $525. Now, as a result of reduced expenses, we are able to offer all three modules — General Ledger, Accounts Receivable and Accounts Payable — in a complete set for just $199.

Proven Power

Peachtree has long been the first name in accounting software and the powerful features we've included in Back to Basics prove we understand what you're looking for.

- Complete integration of General Ledger with Accounts Receivable and Accounts Payable.
- Single transaction entries up to $999,999.99 and year-to-date totals up to $21,000,000.
- Journals and reports updated as each transaction is recorded.
- Void transaction facility automatically creates reversing entry.
- More than 30 reports can be viewed on screen or printed.

Macintosh Specific

Back to Basics was written specifically for the Apple Macintosh, not simply converted from another computer version. It uses the Macintosh interface (mouse and visual icons) for system operation and groups functions into on-screen "file drawers" for organization and ease of use.

Back to Basics was a featured accounting system in Apple's initial ads for the Macintosh and is backed by Peachtree's outstanding support, labeled by InfoWorld as "the finest in the industry". Support is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

Money Back Guarantee

When you purchase Back to Basics directly from Peachtree Software you're protected with a 30-day, money back guarantee (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded. For full details, call the toll-free telephone number below.

Invoicing Coming Soon

Back to Basics Invoicing will soon be available for the Apple Macintosh at an introductory price of $95.

Hardware Specifications

- IBM Personal Computer, PC/XT, PC/AT with one floppy disk drive and a hard disk.
- Apple II +, Ile, Ilgs with 128K and two disk drives or hard disk.
- Apple Macintosh 512K or Plus with two disk drives or hard disk.

Features That Made Back to Basics A Best Seller

GENERAL LEDGER

- Double holds display chart of accounts
- NTD and YTD show on income statements
- Allows automatic journal entries
- Check processing and posting capability through cash disbursements
- Optional cost of sales ranges
- User modifiable Chart of accounts included
- Allows up to 3 checking accounts
- Up to 10 departments with separate income statements

ACCOUNTS PAYABLE

- Fully automatic posting to General Ledger
- Allows partial payments
- Automatically calculates finance charges

ACCOUNTS RECEIVABLE

- Calculates receivables on balance forward basis
- Prints statements and mailing labels
- Allows manual posting to General Ledger
- Accounts receivable

Call now to order or for a dealer near you

1-800-247-3224

In Georgia, call 1-404-564-5800

To order by mail send $199 plus $5 shipping to:

Peachtree Software

4555 Shackleford Road, Dept. MAW-09, Norcross, GA 30093

Circle 553 on reader service card
WHAT EVERY DESKTOP PUBLISHER NEEDS IS A PHOTOGRAPHIC MEMORY.

TAKE A PICTURE. ANY PICTURE.

It can be a photograph, artwork, a technical drawing. Feed it into the Microtek Intelligent Image Scanner, and it’s on your computer screen almost instantly. Then you can edit, paint, and cut and paste it, and reproduce the sharpest image your laser printer can handle.

MACINTOSH OR IBM COMPATIBLE.
The Microtek Scanner can be used with either system. And naturally, it works with the most popular publishing software for both.

INCOMPARABLE VALUE.

For a scanner this sophisticated, you'd expect to make a heavy investment. But the Microtek Image Scanner is less than the cost of a laser printer and can pay for itself in no time.

It's simply the best way to improve your publishing image. For more information call 800-654-4160 (Inside California 213-321-2121).

MICROTEK
16901 S. Western Ave., Gardena, CA 90247.

Circle 585 on reader service card

How To/Quick Tips

System file has special font and desk accessory installations, it may be quicker to use ResEdit to remove JClock. Here's how:
2. Find and open the System file.
3. Open the INIT resources.
5. Choose Clear from the Edit menu.
6. Close all windows, saving changes when asked.

Brad Gallien
Stanford, California

JClock is a shareware utility. There's also a companion utility called Remove JClock, which does what its name implies. Get it from a user group or an online information service like CompuServe (filename REMOVE in DL 2). The current version of JClock available on CompuServe is in the form of an Init resource, which means you install or remove it simply by dragging its icon into or out of your System Folder.

No-Mar MacTablet

Tip: To keep the stylus of your Summagraphics MacTablet from scratching the drawing pad, tape a clear sheet of acetate to the pad. Place your work under the sheet and trace.

Billy Wilkins
Columbia, South Carolina

Prevent Squashed Lines

Tip: In a recent issue, a reader asked how to prevent squashed lines at the top of a page printed on an ImageWriter II. I, too, have experienced this frustration and have found a simple solution. Just advance one sheet of paper through and let it hang there. Start printing on the next sheet. Apparently the extra sheet of paper provides just enough tension to prevent the squashing.

Don Houser
Brea, California.

We pay from $25 to $100 for tips published here. Send tips or questions to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe 70370, 702 or The Source BGCW440. All published submissions become the property of Macworld. □
Has that statistics package you thought was a tiger turned out to be something else?

Most Mac statistical packages call themselves 'professional,' 'comprehensive,' or 'complete.' But feed them some real problems, and you'll discover how toothless they really are. They can't do multivariate procedures or analyze financial time series. Or compute large, multi-way cross tabs.

That's why, if you're serious about statistics, sooner or later you'll end up with SYSTAT. No other Mac package has SYSTAT's range of statistics and high resolution data graphics.

Mac Features: Pull-down menus, Clipboard, Desk Accessories and mouse control of spreadsheet data editor Replay commands Macintosh II* and 68020/68881 versions available

Graphics: More than 50 business and scientific types with PostScript® support for Apple LaserWriter® (300 dpi) Two dimensional Error Bars Scatterplots Line and Vector Graphs Vector, Dot, Bubble and Quantile Plots Bar Graphs (single, multiple, stacked, range) Box Plots (single and grouped) Stem-and-Leaf Diagrams Linear, Quadratic Regression LOWESS Smoothing Confidence Intervals (any alpha value) Smooth Mathematical Functions Rectangular or Polar Coordinates ANOVA interaction Plots Histograms (regular, cumulative) Fuzzygrams Gaussian Histogram Smoothing Scatterplot Matrices (Caseplots Plots) Three dimensional: Data Plots Smooth Function Plots Vector Plots Linear, Quadratic. Surface Smoothing Locally Weighted Least Squares

Statistics: Basic statistics, frequencies, t-tests, post-hoc tests Multi-way crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance) Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances Linear, polynomial multiple, stepwise, weighted regression with extended diagnostics Multivariate general linear model includes multi-way ANOVA, ANOCOVA, MANCOVA, repeated measures, canonical correlation Principal components, rotations, scores Multidimensional scaling Multiple and canonical discriminant analysis, Bayesian classification Cluster analysis (hierarchical, single, average, complete median, centroid linkage, k-means, cases, variables) Time series (smoothing, seasonal and nonseasonal ARIMA, ACF, PACF, CCF, transformations, Fourier analysis) Nonlinear estimation (nonlinear regression, maximum likelihood estimation, and more)

Data Management: Full screen spreadsheet data editor Missing data, arrays, character variables Process hierarchical, rectangular or triangular files or files with variable length records Character, numeric, and nested sorts Merge and append large files Unlimited numeric and character transformations Subgroup processing with SELECT and BY Value labels and RECODE statements Unlimited cases

Mac screens

LaserWriter® graphics

SYSTAT™ Single copy price: $595 U.S./Canada; $695 Foreign; Site licenses, quantity prices. Call or write for further information.

SYSTAT, Inc., 1800 Sherman Avenue Evanston, IL 60201 312 864.5670

Dealers circle 686 on reader service card
End users circle 491 on reader service card

Systat. Intelligent Software.
Introducing DYNAMAC. Because the world of information doesn't sit still.

Your Macintosh™ Computer has moved you easily and intelligently through a full spectrum of desktop solutions. But, until now, that's where the movement stopped. Desktop solutions had to stay where your Macintosh did—on your desk.

With the introduction of Dynamac, however, solutions can go wherever problems or opportunities are. Not just because of the Dynamac's small, sleek physical dimensions but because of its very big performance dimensions.

Up to 40 megabytes of hard disk storage and up to 4 megabytes of main memory are built in. Dynamac's screen is high resolution gold Electroluminescent—equal to the finest graphics—and displays 46% more information than the Macintosh. The internal modem, quiet fan, high-grade surge protector and many other features ensure that Dynamac will be an office-quality resource wherever it goes to work.

Where Macintosh leaves off, Dynamac is picked up..., packed with features and packaged in a sleek black case. It goes easily across town or across the country; it comes home with you as naturally as your briefcase.

Dynamac is a hardy traveler, but also one with savoir faire. The internal 300/1200 Baud modem operates on both U.S. and CCITT international standards; compatibility at 110/220 volts, 50/60 Hz is built in... as is an E-Machine interface for a direct connection to the Big Picture™ monitor.

Dynamac is available in more than two dozen different configurations—with prices starting at just under $5,000. All options and upgrades come from a single point of warranty.

Dynamac. It lets you leave the office without getting left behind.

For additional information, please contact Dynamac Computer Products, Inc., 1536 Cole Boulevard, Suite 252, Golden, CO 80401. (303) 233-0305.

Dynamac
Because the world of information doesn't sit still.
Getting Started with Networking

Learning to share, stringing wires, and understanding communal computing

by Jim Heid

Imagine a network as an electronic freeway system where data races from one interchange to another at 186,000 miles per second. From a vantage point in the breakdown lane, you might see parts of a document shoot from a Mac to a laser printer. A moment later, an "out of paper" message from the laser printer might travel in the opposite direction. Soon after, a roadweary document might pull into the network's rest area, a shared hard disk called a file server.

Remarkably, this highway has but one lane, built from a pair of copper wires twisted around each other. The travelers avoid crashing into each other and arrive at the proper interchange through a complex but effective scheme of data encoding.

But a network is more than a breeding ground for elaborate metaphors. Networks can be a great way to share expensive equipment and improve communication between coworkers—if you're willing to invest the time it takes to install one and educate its members in network etiquette.

This month, we take to the electronic roadway to investigate the pleasures and pains of Macintosh networking.

When Apple Talks...

About a dozen network systems exist for personal computers, but Apple's AppleTalk has a near monopoly among Macs. And with good reason. Most networks for IBM PCs require a $300-to-$600 network expansion board for each machine on the network. AppleTalk capability, however, is built into every Mac. You need only add cables and connectors. To return to the highway metaphor, every Mac contains its own on- and off-ramps; you just add the pavement between them.

For most Mac-equipped offices, AppleTalk's biggest benefit is that it lets up to 32 machines share big-ticket add-ons like a laser printer and a hard disk. Like a co-op vacation home, a LaserWriter is a less painful purchase when a large group can enjoy it. Also like that vacation retreat, a LaserWriter can't accommodate everyone at once. LaserWriters and other PostScript printers contain built-in print server software that lets the printer handle print jobs on a first-come, first-served basis. If someone else's job is printing when you try to access the printer, you'll get a message that the printer is busy.

(continues)
NetModem V1200 is the first modem designed especially for the Macintoshs and AppleTalk. It has a friendly Macintosh interface. And you can communicate effortlessly over a single phone line using any of the leading Mac communications programs.

NetModem V1200 is 100% Hayes compatible. It communicates at either 300 or 1200 bauds, with a complete set of modem features including auto-dial and auto-answer, and touch pulse dialing. The NetModem even lets an outside caller page any user on the network.

Having a NetModem on your AppleTalk network is like having a Hayes compatible modem built into every one of your Macintoshes, only better.

$599, your savings in modems, phone lines, and time will pay for the NetModem many times over. For more information and the name of your nearest dealer, call 1-800-458-3550.

Circle 787 on reader service card

SHIVA Corporation
SUITE 1200, 222 THIRD STREET
CAMBRIDGE, MA 02142
How To/Getting Started

(If you spend more time drumming your fingers than printing, consider getting a print spooler; a program that intercepts and holds data en route to the printer, returns control of the Mac to you, then converses with the printer while you work. For more information, see “Getting Started with Spooling,” Macworld, March 1987, and “Speaking of Spoolers,” Macworld, June 1987.)

A shared hard disk offers its own benefits. A central warehouse for documents, it saves everyone the trouble of passing floppy disks around to exchange files. In offices where several people work with the same documents, a shared hard disk could help clear up some of the confusion about whose versions are the most current.

Unlike LaserWriters, most hard disks don't contain built-in server software. To share one, you need networking software such as Apple's AppleShare, Centra's TOS, or General Computer's HyperNet. Those programs allow network members to use a remote hard disk as if it were a local one plugged in right next to the user's Mac. The software also provides security measures that help prevent unauthorized users from riffling others' files. (AppleShare is previewed in "AppleShare: Multifacet Networking," Macworld, March 1987, and the other products are reviewed in "A Network Divided," Macworld, October 1986.)

The Early Bird Gets the File

Because file server software turns a hard disk into a shared storage area, the possibility exists that more than one user could try to modify the same document at the same time—an event that can result in confusion, a destroyed document, or a system crash. Why? Imagine Dave and Beth simultaneously opening the same MacWrite document. Dave completely rewrites paragraph one. Beth, meanwhile, sees the old paragraph, thinks it's basically sound, and starts editing it. Get the idea? One user's changes can't magically appear on the other screen, and both users can't have the current version of the document.

One part of a file server's job, then, involves keeping track of who's opened what. It does so through file-access protocols—rules built into the file-serving software that specify how users can access files. A file-locking protocol prevents the situation just described by locking a file to prevent alteration after someone has opened it.

(continues)
LASER PERFECT VISION.

Imagine your PC being able to see photos, graphics, illustrations and precisely position them on your reports and proposals before they appear in print on your laser printer. Preview the graphic impact of charts and tables, modifying at will, before pressing the print button.

The Princeton LS-300 Scanner affords you the gift of foresight. It can scan a full page of text and images into your IBM PC/XT/AT or compatible at a laser-perfect 300 dots per inch.

The compact design of the LS-300 is ideal for desktop publishing applications, especially newsletters, reports, and proposals. Hardware dithering produces 32 levels of gray to make photos and illustrations pop off the page.

The LS-300 can be used with your PC system with CGA, EGA or monochrome displays, or teamed with the new Princeton LM-300 or LM-301 Print Preview Monitor, the LS-300 provides you full page visual effects before printing. And teamed further with an optional OCR software package, the LS-300 is trained to read and store typewritten pages.

Free PC Paintbrush Plus!
A $149 retail value, the amazing PC Paintbrush Plus is yours free with the purchase of the LS-300 Scanner. PC Paintbrush Plus lets you create image files which can be used with Ventura Publisher, PageMaker, etc. for professional quality drawings, diagrams, charts, graphs and headlines. Use your mouse, joystick or digitizer to manipulate images to create precisely the effect you want. Incorporate company logos too!

Cost Effective.
Put a spark into the methodical task of scanning with the quick, creative and productive LS-300. It's available with adapter board, PC Paintbrush Plus software, and all cables at a suggested retail price under $1,200. For an eye-opening demonstration — and an example of Princeton quality and reliability — visit or contact your Princeton dealer today.

*New Image Technology, Inc. 10300 Greenbelt Road, Sea Island, Maryland 20706
Circle 656 on reader service card
But some tasks, especially database management and accounting, benefit from users being able to simultaneously modify a file. Special multiuser versions of software applications allow people to work on the same file over a network. With a multiuser database manager, for example, a secretary can enter new client records, a sales representative can scan for product availability before booking an order, and a shipping clerk can update inventory figures—all at the same time from the same database.

A multiuser program handles those simultaneous requests without file clobbering through a record-locking protocol, which allows multiple users access to a file, although only one person at a time can modify a given record.

Before AppleShare debuted earlier this year, no standard file- or record-locking protocols existed for the Mac. Apple had built the highway, but hadn't finished defining how traffic should flow. That forced developers of file-server software to decide for themselves. Each came up with its own scheme, giving multiuser software developers three less-than-ideal choices: supplying separate program versions for each file server, supporting only one or two file servers (and reducing their potential market), or designing their own file-sharing protocols and building them into their application.

With AppleShare came the AppleTalk Filing Protocol (AFP), Apple's precepts for network file access. Having an Apple-sanctioned set of file-sharing rules makes multiuser file server easier for software firms and users, although file server developers have had to scramble to make their products compatible with AppleShare and AFP.

**Dedicated or Distributed?**

If you've used hard disks, you know they're far faster than floppies. You might think a shared hard disk extends those speed benefits to everyone on the network, but it isn't so. AppleTalk can transfer about 230,000 bytes per second, versus the roughly half-million bytes-per-second transfer rate of the Mac SE's SCSI port. That difference, combined with the extra communications overhead inherent in a network, makes a remote hard disk only slightly faster than a local floppy.

And performance slows as the network grows. When many users simultaneously start programs or copy files located on the server, you can discard your stopwatch and measure the network's per-
Ever since paper replaced cave walls as man’s favorite vehicle for expression, the attempt to communicate ideas has been an enduring source of frustration. That frustration has just been eased dramatically. Because Letraset introduces Ready, Set, Go! 4.0—an enhanced version of what InfoWorld called “the new champion among Macintosh desktop publishing programs.”

To put it simply, Ready, Set, Go! 4.0 is the easiest, fastest, most creative way yet devised of helping you organize, visualize and edit your thoughts onto professional-quality pages. In fact, it removes any meaningful distinction between what you can do at your desk and what might otherwise require large budgets, long lead times and a studio full of designers.

The technically inclined will be pleased to note that it has a unique
it any easier to have
tier to express them.

block architecture that enables you
to envision the finished page before
it’s finished.

Integrated word processing with
real-time hyphenation that lets
you create and design text and image
simultaneously. Plus such essential
tools as arbitrary runarounds, custom
page sizes, style sheets and support
for high-resolution graphics.

For those more concerned with
the ultimate outcome of these fea-
tures, Ready, Set, Go! 4.0
will help you make a raw concept
blossom into a newsletter of finished
elegance. Transform random brain-
storms into a report of symphonic
coherence. Or create a dazzling busi-
ness presentation from a jumble of
brilliant insights.

And although other software
packages may talk about doing all
this, Ready, Set, Go! 4.0 is the only
one that can put it down on paper.

For more information, in-
cluding the location of your nearest
authorized Letraset graphic design
software dealer, call (800) 722-0377.
If you purchase Ready, Set, Go! 3.0
between June 1-August 11, you receive
an upgrade at no charge.

© 1987 Letraset, Inc. Ready, Set, Go! is a trademark of Manhattan Graphics. Macintosh is a trademark of Apple Computer, Inc.

Circle 652 on reader service card
Epson Ribbon Inker Kit
Call for Prices
Motorized Ribbon Inker silently re-inks all ImageWriter I and II fabric ribbons again and again. Print quality surpasses new ribbons—and gets better with each re-inking! Specially lubri-

Bede Tech Bonus • FREE 4 oz. Bottle Black Ink, FREE Roller and Roller Cover
ImageWriter I & II Ribbon Inker Kit
BEDE TECH DIRECT $49 Reg. $67 Value

WOULD YOU PAY $49 FOR A LIFETIME RIBBON SUPPLY?

Your Bede Tech Ribbon Inker Quickly Pays For Itself!

Coad black ink actually extends print head life. 4-oz. ink bottle lasts 50-100 re-inkings. Our customers love the quality, simplicity, and savings!

Bede Tech Bonus • FREE 4 oz. Bottle Black Ink, FREE Roller and Roller Cover
ImageWriter I & II Ribbon Inker Kit
BEDE TECH DIRECT $49 Reg. $67 Value

Cool Your Mac with Fanny Mac
Built without its own fan, your Mac is prone to overheating. The more powerful your Mac, the hotter it runs. High operating temperatures can cause component failure or even burn out your circuit board.

Intelligently designed by Steve Beck's Beck Tech, FANNY MAC is the Original Macintosh Fan!

- Lowers operating temperature as much as 50°.
- Moves more air through your Mac—24 cu. ft. per min.
- Only Macintosh fan with dependable ball bearing motor. Actually runs quieter the longer it runs.
- Built-in surge protector.
- Lighted switch that controls both fan and Macintosh.
- Fits flush into Mac's handle.
- Quickly snaps in and out with no effort, no tools.

BEDE TECH DIRECT $74.00 Reg. $99 Value

90-Day Satisfaction Money Back Guarantee • FREE Catalog with Order.

Call Toll Free
800-772-4536
8327 Clinton Road, Cleveland, OH 44144
216/631-4214

Member, The Bede Companies, Est. 1976

Circle 490 on reader service card

How To/Getting Started

formance with a calendar. Aware of AppleTalk's limitations, file server manufacturers usually recommend that you use System files and large applications from a local floppy or hard disk rather than from the server.

One way to break up the bottleneck is to set up a distributed network that uses file server software such as Centram Systems' TOPS. Rather than tying all machines into a single hard disk, a distributed network turns two or more hard disks, each attached to its own Mac, into file servers. People who use large, complex applications or work with colossal documents can work at the machines with the hard disks, while others use the file server software to access the hard disks remotely for file sharing.

Another way to boost performance is to donate a Mac and its hard disk to the network as a dedicated file server. This approach, taken by AppleShare, eliminates the possibility of using that Mac locally. Relying on Macs as a local workstation, you devote its resources to the network and allow it to concentrate on serving. And its life as a computer isn’t completely over; a Mac running AppleShare can also run other types of network software, such as print spoolers and electronic mail packages.

Lines of Communication

A network can be more than a way to share files and equipment. With electronic mail (E-mail) software like Internet's InterMail, Videx's Mail Center, and Think Technologies' InBox, members of the network can use its wires to exchange messages. (InBox is reviewed in "Mac E-Mail Comes of Age," Macworld, February 1987; InterMail, in Reviews, May 1987; and Mail Center in "Special Delivery," December 1985.)

Creating an electronic post office involves entering the names of all the network’s users along with optional security passwords. Then, each one can use the message center desk accessory to send communiqués and disk files to other members of the network, who are notified of the delivery by a message on the Mac screen. (E-mail packages have an audible alarm option, a good alternative if you don't mind being beeped at when you’re busy with something else.)

E-mail products also have “carbon copy” options that let you send the same
It's ironic. These days, modems bring the world to you at the speed of light. But for all their awesome speed and power, these high-performance machines just sit there on your desk like a low-tech toaster.

But now, we're introducing the Migent Pocket Modem. It's 100% Hayes-compatible, so it works with virtually any PC: IBM, Apple, or whatever. It runs at both 300 and 1200 bps. It has a full set of Hayes AT commands. A 28-character non-volatile memory. Remote ring and tone sensing. Busy and dial tone monitoring. And even dual phone jacks.

But that's where all similarities end. The whole modem is smaller than a 3" x 5" card and works on a 9 volt battery or AC power. So you can put it in your shirt pocket or briefcase, and take it home, on the road, or anywhere else you need your PC.

The Migent Pocket Modem. If you'd like to know more, send in this coupon or call 800-633-3444, Dept. 601, and ask for Alexis. We'll send you full information and the name of your nearest dealer. But in the meantime, you may be wondering why this modem isn't beige like the rest. Because we think it's about time a high-powered information machine looked like one.

THE MIGENT POCKET MODEM:
A STATE-OF-THE-ART INFORMATION MACHINE THAT LOOKS LIKE ONE.

Circle 694 on reader service card
message to multiple users, and they offer electronic replacements for those ubiquitous "while you were out" message slips.

Beaming messages to coworkers can save footsteps, and it certainly adds a workplace-of-the-future touch to an office, but don't think that E-mail is vital to your network. For one thing, setting up an electronic post office takes time and disk space. For another, the E-mail desktop accessory that runs on each recipient's Mac takes a chunk out of memory that may already be in short supply on 512K machines. And E-mail systems may beam messages in a flash, but they'll sit unread if their recipients don't bother to answer the mail call.

Dialing for Data
I said earlier that creating an AppleTalk network involves putting pavement between machines. That pavement comprises a $75 AppleTalk connector, which attaches to the Mac's printer port (or a laser printer's serial port), and cable, which sells for about $2.50 per foot. The connector electrically isolates the network, helping to prevent wholesale equipment carnage should one Mac or another networking component die. The cable isn't too different from what you'd find in a stereo system. It contains a pair of wires twisted around each other, surrounded by a braided wire shield that keeps electrical interference out and prevents the signals in the cable from interfering with nearby radios or TVs.

Considering the cost of IBM PC networks, spending about $100 per Mac isn't bad. And it can be even cheaper. Farallon Computing's PhoneNet uses a building's existing telephone wiring and replaces Apple's $75 connectors with ones that some mail-order suppliers sell for less than $40. PhoneNet sends signals on two unused phone wires, so your telephone system isn't affected. A PhoneNet network functions basically like an AppleTalk one, with a difference: a PhoneNet line can be up to 3000 feet long, versus AppleTalk's 900-foot limit. You can even mix and match PhoneNet and AppleTalk connectors with a $6 adapter. If you'd rather not use your phone lines for the network, standard telephone cable also works.

(continues)
Your data is everything. It represents the culmination of all of your efforts...your accomplishments. So when it comes to turning your data into graphic presentations, you can’t afford to settle. You need the power to achieve the ultimate. You need Cricket Graph.

Only Cricket Graph gives you the ability to transform your data into brilliant color presentations. Choose from 12 of the most popular graphs and charts. Plot 2000 data points per series. Import data in many popular formats. Then enhance your graphs with text and a full range of patterns, symbols, and colors. Even add a three dimensional look. When completed, you can print your work on any of the popular Mac compatible printers.

It’s elegance defined - powerful, yet easy. No wonder Cricket Graph was voted “Best Business Graphics Package of 1986” by the Editors of MacUser.

Don’t allow the limitations of your software to prevent you from achieving the ultimate. With Cricket Graph, your potential is limitless. Only $195 at dealers everywhere.

Requires a 512K Enhanced Macintosh or a Macintosh Plus.

30 Valley Stream Parkway
Great Valley Corporate Center
Malvern, PA 19355
(215) 251-0890 1-800-345-8112

Macintosh is a trademark of Apple Computer Inc.

Circle 685 on reader service card
### How to/Getting Started

![Network Diagram]

**How a Network Works**

A transmission from a device on an AppleTalk network reaches all the devices on the network, but only the intended device responds. The server then specifies a channel for further conversation so that the data from various machines doesn't get mixed up.

---

Whether you opt for Apple’s connectors or Farallon’s, it’s easy to snap them together if the equipment is in close proximity. The wiring job may become quite complicated, however, depending on the area to be networked. You attach a connector to each Mac’s printer port, plug a cable into the connector, and plug the other end into the next machine’s connector.

One mistake you can make is creating a circle by using one cable too many (see “A Network Diagram”). A highway isn’t of much use if you end up where you begin; the same applies to an AppleTalk network, which must have a beginning and an end.

Another potential pitfall: leaving a cable unconnected. As far as AppleTalk is concerned, the end of the network is an AppleTalk connector with only one cable attached. When the network’s traffic flows into one of these connectors, it’s absorbed as it tries to leave the connector (see “How a Net Works”). If a cable is dangling somewhere without a connector, however, the signal isn’t absorbed. The network never gets the message that it’s the end of the line, and traffic comes to a standstill. Without being properly terminated, without a definite end point, the network doesn’t work.

Networks built around Apple’s cables have one other vulnerability: Apple’s cables. With no thumbscrews or other secure means of attachment, the cables can loosen or disconnect accidentally when someone repositions a Mac or stumbles over a cable. Kensington Microware’s AppleTalk clips keep cables and connectors united, and at $25 for 25 of them, they are cheap insurance against broken links.

When your network is wired properly and securely, it’s ready for use. If the network is strictly for LaserWriter sharing, you can simply turn the LaserWriter on and then use the Chooser desk accessory on each Mac to select the printer. For networks with a file server, you'll need to install the file-server software and, with some products, specify each network member’s user name and security password. After that, you can share your heart out. You may want to educate the network’s members in some basic rules of network behavior to get started on the right foot (see “Net Etiquette”).

### Assessing Net Gains

A network may require as much dedication from its tender as it does from its...
You've probably felt the frustration. All of that graphic power just waiting to be tapped, without software to unleash the potential. Frustrate no longer — Cricket Draw is here.

Cricket Draw is an object-oriented drawing program that brings a whole new dimension to the WYSIWYG environment. WYSIWYG is great but the end result is limited by the Mac's display resolution (approximately 5,000 dots per square inch). Cricket Draw, through the magic of PostScript, lets you take full advantage of the LaserWriter's superior resolution of 90,000 dots per square inch. The final product is sensational artwork that will bring a new level of professionalism to your work. With Cricket Draw WYGBITWYS (What You Get Is Better Than What You See).

Unrestricted Creativity. Cricket Draw liberates your creativity by providing an unprecedented range of tools, like tilting and free rotation of any object. You can shade with a gray scale (0-100%), create shadows, fountains (graded tints), starbursts, grates, and smoothed curves. And that's just the beginning.

Precisely set type then add any of a number of special effects. Place type on any arbitrary path, rotate, tilt, shade, shadow — the possibilities are limitless.

Achieve Your Ultimate. Settle for nothing less than your ultimate. It's within your grasp with Cricket Draw.

Requires Macintosh Plus or New ROMS

You've probably felt the frustration. All of that graphic power just waiting to be tapped, without software to unleash the potential. Frustrate no longer — Cricket Draw is here.
Net Etiquette

Following some basic rules can help make communal computing work smoothly:

- **Run Applications Locally** Avoid running large applications from a server; they'll perform slowly and bog down the server. Small, fast-loading applications like MacPaint work well from a remote server, but a complex program like Helix can make a network snail-slow. Run large applications locally, ideally from a hard disk or a RAM disk; use the server primarily for document storage and sharing.

- **Don't Run Unreliable Software** Never run prerelease software on a network. A crash for one may mean a crash for all.

- **Don't Delete Casually** Don't throw away a file with a cryptic name—it might be a colleague's precious work file. Check with others before deleting files you don't recognize.

- **Release Volumes You Don't Need** When you've finished with a server volume (a folder on AppleShare or a disk symbol on other network software), release it so that others can use it. Drag the volume's icon to the Trash Can on the desktop or use the network desk accessory to release it.

- **Don't Break Connections** If you must unplug an AppleTalk connector from the network, make sure all users have saved their work. Reliable network software can usually reestablish a connection, but don't count on that.

- **Use the Disk Cache** With a Mac Plus, SE, or II, activate the Control Panel's disk cache to decrease the number of disk accesses.

- **Use the Same System Version** Make sure each machine on the network is equipped with the same version of the System, the Finder, and printer drivers. And keep the System and Finder on local hard disks or floppy disks—never run them from the server.

- **Share Applications Carefully** Most existing programs weren't written with network use in mind; they may crash if several users try to access them simultaneously. Make sure a program is designed for network use before storing it on a shared hard disk. Then there are the legal ramifications of networking: you may be required to buy a special license or purchase multiple copies of a program to use it on a network.

- **Back Up Religiously** The crash of one person's hard disk leads to depression; the crash of a shared hard disk can lead to a riot.

file server. Setting up and using a network for anything more than LaserWriter sharing takes time, organization, planning, teamwork, and some faith. The Mac is a complex computer, and when you combine several Macs, you also increase the possibility that something will go wrong. Remember that you can always share files by handing someone a floppy disk, and you can still send a message with pencil and paper. Before taking the plunge, assess your office's needs and make sure they warrant the time and money you'll spend.

If you're still convinced that networking is for you, forge on. Compared to network technology available on other personal computers, Macintosh networks are inexpensive and blessedly uncomplicated, thanks to the standard protocols, the Mac's friendly face, and the built-in AppleTalk connection.

See Where to Buy for product details.
MacCalc is faster than Excel:

"Amazingly speedy...[MacCalc] runs faster than Excel."  
InfoWorld, November 3, 1986

"Blindingly fast."  
InfoWorld, November 3, 1986

"Special routines in MacCalc make operations such as entering data and recalculating, opening files, scrolling...faster than Excel."  
Macworld, December 1986

MacCalc is easier to use than Excel:

"Working! in MacCalc is easier than in Excel."  
Macworld, March 1986

"Designed to be easy to use, and succeeds admirably."  
MacUser, March 1986

"MacCalc makes such excellent use of the Mac interface that it is a pleasure to use."  
MacUser, September 1986

MacCalc produces quality output:

"MacCalc offers [the greatest] flexibility in page and font setup, and has the most printing options."  
MacUser, September 1986

"MacCalc functioned flawlessly when asked to display or print any combinations of the fonts or style available. As a result, our spreadsheet output could be used directly in reports."  
InfoWorld, September 1986

Your best choice:

"The result is a clearly superior performer... It is difficult to rate MacCalc anything but excellent."  
InfoWorld, November 3, 1986

"MacCalc is the spreadsheet of choice for users who want useful functionality without undue complexity."  
MacUser, December 1986

"The Best Spreadsheet."  
MacUser, Editor's Choice Award

Special features:

- On-Line Help
- Full Undo command ("Fully implemented Undo allows you to recover gracefully from mistakes")
- Cell notes, for audit trails and self-documenting work-sheets ("Don't underestimate the value of this feature.")  
San Jose Mercury News
- Reads and writes WKS models (from Lotus 1-2-3 or Excel) and SYLK data
- Variable row height and column width
- Full choice of format, font, size, and style (à la MacWrite) for any cell ("A real boon... adds to that presentation charm.")  
San Jose Mercury News
- Paste formatted tables from MacCalc directly into MacWrite or PageMaker documents
- Database sort, search, and fill commands ("More powerful than Excel's.")  
Macworld
- Full desk accessory (DA) support and Switcher compatibility: MacCalc integrates with your favorite charting or macro programs and DAs

It all adds up:

The spreadsheet is the premier productivity tool for preparing, analyzing, and presenting financial and budgetary reports (like cash flows, income statements), and for keeping simple lists (like sales, inventory, or price lists). Accordingly, the major criteria of your spreadsheet purchase decision should be speed, ease of use, and quality of output.

You can buy a slower, more difficult, over-priced, over-featured product from the competition, or you can buy MacCalc, the best spreadsheet for your real needs, for $139.

For technical, corporate or dealer information, please call 415-841-8552.

To order MacCalc for $139 (plus tax in CA), call 800-345-2888, or write:

BravoTechnologies, Inc.  
c/o DPAS  
P.O. Box T  
Gilroy, CA 95021-2249
If you're serious about your Macintosh™, it's time to get serious about your LaserWriter™.

**Speed**
Get your Macintosh back up to 80% faster when sending print jobs to the LaserWriter. And not just your screen, the full power of the Macintosh!

**Network Productivity**
If you're serious about your system, be sure that your printing is not taxing your network. The LaserServer handles printing functions in an efficient manner, easing traffic loads on your network and improving productivity particularly when using file sharing, or inter-office mail.

**Queue Management**
The network manager can assign 1 of 5 priority levels to each user on the network, and can restrict LaserWriter access to authorized users only. Individuals may also rearrange their own jobs in the queue.

**Disk Consumption**
The LaserServer uses its own memory to store jobs; therefore, you never have to worry about eating up disk space when printing jobs. The LaserServer comes with 2 Megabytes and is expandable (through slots) to 12 Megabytes.

**Compatibility**
The LaserServer is compatible with any application using LaserWriter driver 5,3 and above, including PageMaker™ 2.0. It is also compatible with PCs using the Tangent Technologies PC card or TOPS™, as well as the Unisys P100, 300 and 500.

Get serious, and see your local Apple™ dealer today, or call us for the dealer nearest you.

Circle 354 on reader service card
Insights on Microsoft Word 3.0

Savvy readers share their best tricks and tips for the new version of Word

Edited by Nancy E. Dunn

From a quick glance at the documentation for Microsoft Word 3.0, anyone could see lots of room for experimentation—and confusion. Any product with so many features provides good territory for exploration, so in May we asked readers to help uncover tips to collect in an article. We had no idea what the response would be or how many $25 checks we’d be sending out in thanks. It’s been the most interesting mail call in a long time; we might just make a habit of this.

Many people wrote in frustration—or despair, depending upon how much work was on the line—over problems in the original release of the new version. (One fellow offered to pay us $25 for a satisfactory way to index a long book.) Many others sent in clever workarounds for problems the 3.01 release has apparently solved (at press time we were testing prerelease version 3.01g). A number of suggestions (those not attributed to readers) were compiled by the editor and based on research gathered from various sources.

The tips we present here still only scratch the surface of Word 3.0’s richness. For example, this collection doesn’t cover working with tabular material, multiple columns, or mail merge (which is covered in “Mastering Mail Merge” in this issue). But this won’t be the last time we print hints for this program. Send additional insights to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. We pay $25 to $100 for published tips.

Many readers sent in lists of their favorite keyboard shortcuts. Microsoft has loaded the new version of Word with keyboard equivalents for menu and mouse commands. Trouble is, there are way too many to recall, at least until we all devise Roy G. Biv schemes that help us remember them. In fact, almost anything you can do with the mouse you can do from the keyboard, whether scrolling or formatting. With the exception of full-time word processors and writers, however, nobody will be able to keep track of all the shortcuts.

To avoid memory overload, start by spending some time with the Quick Reference Guide to get to know the range of time-savers available. Then, observing your own work habits, zero in on the short list of commands that will help you the most; for example, cursor control commands or type style commands. You’ll pick up the others as you go along. Here are a couple of reminders and undocumented shortcuts (see also “The Key to Commands”).

**Shortcuts and Reminders**

- In Page Preview mode, instead of selecting the magnifying glass to zoom in on an area of your document, just move the (continues)
How To/Insights

arrow over the appropriate section and double-click.

Jim Wolcott
Huntington Beach, California

Thanks also to Tony L. Ludiker of Spokane, Washington, who sent in the same tip.

- Option-P moves the cursor to the first character in the previous screen.
- Option-. (period) moves the cursor to the final character of the next screen.

Carol Smith
Sacramento, California

- If a keyboard shortcut doesn't work, check to see if you are in Short Menus mode (if you see the Full Menus selection on the Edit menu, you are in Short Menus mode). Shortcuts for menu items that don't appear on the short menus don't work unless you have selected Full Menus.

- The Clear key toggles the numeric keypad between cursor movement and number entry. Look for the A at the right end of the menu bar that indicates you're in Numbers mode.

Shortcuts on the Short Keyboard

- You can select menu items from the keyboard even with the original short Macintosh keyboard. Press the # and Tab keys simultaneously to activate the menu bar for 5 seconds. Once it's selected, pressing a number from 0 to 8 opens a menu—0 for the Apple menu, 1 for the File menu, and so on. You may also select by typing the first letter of the menu name.

After you've selected a menu, use #-Option-K and #-Option-L to jump between the menus. Highlight a command on the menu by pressing the first letter of the menu item or by pressing #-Option-O (comma) for next menu item. Once the item is highlighted, press Return or Enter to select the command.

Cancel the selection process at any time by pressing the Backspace key.

Shawn R. Joslyn
Lansing, Michigan

Stop, I Say, Stop

- To exit Page Preview mode without resorting to menus, press #-. (period).

Brad Wong, M.D.
Honolulu, Hawaii
Changing fonts from the keyboard:
1. Select the text or insertion point.
2. Press Option-V.
3. Type the letter(s) beginning the name of the font.
4. Press Enter or Return.

(Version 1.05 required typing in the font's System ID number instead of its initials but did not require the fourth step.)

Inserting glossary items into text:
1. Press Option-Backspace.
2. Type the item's name or abbreviation.
3. Press Enter or Return.

(Version 1.05: reverse steps 1 and 2; skip step 3.)

Copying character formats:
1. Select the text that's formatted as desired.
2. Press Option-V.
3. Select text to be modified (a faint underline appears).
4. Press Enter or Return.

Note that this 3.0 technique changes only the first character format that occurs in the selection; if the text you selected to reformat begins with the desired format, this shortcut doesn't change any of the selected text. (Version 1.05: select the text to format, then Option-Click in any text that has the format you want to copy.)

Copying paragraph formats:
1. Select paragraph that's formatted as desired.
2. Press Option-V.
3. Select paragraph(s) to reformat (a faint underline appears).
4. Press Enter or Return.

(Version 1.05: select paragraphs with desired format, then Option-click in the selection bar to the left of any paragraph you want to reformat.)

The Key to Commands
Many of the keyboard shortcuts that had grown familiar to Word 1.05 habitués have been replaced with new—somehow less convenient—keyboard equivalents. Harry Lime of Palo Alto, California, performed a public service by drawing up a list of the conversions from 1.05 to 3.0.

• . (period) is the ultimate shortcut for "stop." It stops nearly any procedure in midstream; according to Microsoft, about the only exception is a sorting operation that's already finished but not displayed.

What's Normal, Anyway?
• Many people complained that the Plain Text command doesn't work as expected. Instead of turning your Venice Bold Underline type to plain Venice, selecting Plain Text makes it revert to what your style sheet says is Normal: 12-point New York—unless you've told Word that Normal means something else.

To make the text revert to the plain version of whatever font you happen to be in, toggle off the type emphasis, either on the Format menu or through keyboard equivalents. For example, when you're typing in Palatino, select italic by pressing Option-Shift-I, type the italic words, and then go back to plain Palatino by pressing Option-Shift-I again. Unfortunately, this procedure won't work with sub- and superscripts. Once you're in sub- or superscript mode, if you return to Plain Text via the Format menu or the Option-spacebar shortcut, you end up with New York again instead of Palatino. The moral, says tipster Jason D. Harry of Brookline, Massachusetts: learn how to use style sheets to change default fonts, if you plan to use keyboard shortcuts for character formatting.

Word Count
• Word's spelling checker doesn't tally the number of words in a document, but here's a way to figure it out on simple documents. Select Change on the Search menu. Enter ^w in the Find box and ^n in the Change To box. Click Change All to find all the spaces and change them to end-of-line marks. Select Section on the Format menu and then click on Line Numbering, Continuous, and OK. Select Page Preview from the File menu, drag the scroll box to (continues)
Tecmar Introduces QT-Mac40™ — the Very Fast, Very Small, 40MB Tape Backup for Macintosh.

It's up to twice as fast as many tape drives. It's so small it fits anywhere on your desk, or in your briefcase. And it stores a big 40 megabytes of data on a single, mini tape cartridge.

It's the QT-Mac40! And it's only from Tecmar, a world leader in tape backup for personal computers, with more than 70,000 satisfied customers.

You Need QT-Mac40...if you keep important data on a hard disk. Work in progress should be backed up periodically—daily or weekly. At up to 3MB/minute-backup speed it won't take long. And, if you're too busy, QT-Mac40 can back up by itself automatically and unattended.

You Need QT-Mac40...if you could use extra room on your hard disk. Seldom accessed files can be archived onto tape and shelved, giving you room to grow. And with QT-Mac40's unique Tape Library System you can quickly find the location of any archived file without installing a single tape.

You Need QT-Mac40...if you would like to share large amounts of data. A single, inexpensive Tecmar QualityTape™ Mini-Cartridge easily fits into a shirt pocket or overnight-mail pouch. And QIC-100 compatibility assures tape interchangeability between drives.

Guaranteed Quality. QT-Mac40's two-year warranty includes Tecmar's exclusive QuickTurn™ Quality Service. It guarantees that if you have any trouble with your QT-Mac40 in the first six months of operation, Tecmar will send a replacement within 48 hours. That's made-in-the-U.S.A. quality...guaranteed!

For more information on QT-Mac40 call (216) 349-1009. Or write Tecmar, Inc., 6225 Cochran Road, Solon, Ohio 44139-3377.
The business software you’ve wanted for your Macintosh has been running on the IBM PC for years. It’s written in dBASE, but now you can run it on your Macintosh.

With McMax™, McMax runs dBASE programs up to 10 times faster and gives you an outstanding choice of existing applications. Accounting, order entry and inventory control systems. Time billing, estimating and taxes. Payroll, personnel and mailing lists. Just transfer what you need to your Mac and it’s yours.

If you'd rather do it yourself, you'll find that McMax is just what you need.

Pull-down menus and an Assist mode help you manage your data with no programming experience. And whenever you want to, you can take control with a rich set of English-like commands that you use interactively or in your own custom programs.

Whatever your mind can conceive, McMax makes it easier to achieve. It's the business database management standard, made better. To learn more, write Nantucket Corporation, 12555 Jefferson Blvd., Los Angeles, CA 90066.

Or call (213) 390-7923 today. Because today, McMax means business.

Your future is history.
You could buy a Macintosh for more, but why?

You could buy a Macintosh for more, but why?

Macintosh Compatibility
More than 95% of all Macintosh software runs on the Lisa. Call today for our free Lisa Fact Book and see how the Lisa can handle the most popular applications for much less than you would spend on a newer Mac and hard drive. We’ll even buy that software...FREE.* It comes standard with a larger 12" screen, detached keyboard with numeric keypad and available in several affordable configurations. Even HFS is now available for the Lisa. Call today. You could be mousing around tomorrow on a Lisa for less!

Ask about our Free Software Deal!

<table>
<thead>
<tr>
<th>RAM DRIVE</th>
<th>NEW</th>
<th>USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Mb 5Mb ProFile</td>
<td>$995</td>
<td></td>
</tr>
<tr>
<td>1Mb 10Mb Internal</td>
<td>$1795</td>
<td>$1495</td>
</tr>
<tr>
<td>1Mb 20Mb Internal</td>
<td>$1995</td>
<td>$1795</td>
</tr>
</tbody>
</table>

*Includes HFS and Software Coupon offer. Please call for details.

MacWrite's "Best Buys"

- BOOK Mac External Drive $195
- Avantex 1200B Modem w/cable $129
- Panasonic Printer 1200AP (ImageWriter compatible) $195
- Mouse Parts $5
- Padded Mac Nylon Carrying Case $59
- MacWrite 1.2.2/MacPaint 1.3 $149

ORDERLINE
800-752-7031
Questions-Service

For a complete listing of products CALL FOR OUR LATEST CATALOG

Sun
Remarking
P.O. Box 4059, Logan, Utah 84321
Apple, the Apple logo, HFS, Lisa and Macintosh are registered trademarks of Apple Computer, Inc.

Circle 618 on reader service card

How To/Insights

The Rule of Formats
The new version of Word includes a format ruler that closely resembles MacWrite’s, with margin indicators and tab wells, justification, and line-spacing tools. Clicking on the X at the extreme right deletes special formatting you have added to a paragraph.

I hereby give permission to the instructor to post my grade for this exam and for the course beside my social security number. (signed)

I hereby give permission to the instructor to post my grade for this exam and for the course beside my social security number. (signed)

Little Boxes
Pressing Return closes a box around a paragraph, so if you want to add vertical space inside a box you can do so with the Tab key. Here a signature blank was added by selecting Underline type style between two Tabs.

the end of the document, and use the magnifying pointer to look at the number before the last word listed.

Steve Charnovitz
Falls Church, Virginia

Narrowing the Gap
If you don’t want to bother with the Paragraph dialog box, you can change the spacing between paragraphs simply by selecting Show Paragraph on the Edit menu (or pressing ⌘ Y), selecting the paragraph mark, and changing the font size for the paragraph mark. Use the ⌘ Shift-< and ⌘ Shift-> combinations to adjust font size from the keyboard.

Bill Jastram
Thalatim, Oregon

Formatting First Lines
On the format ruler, the left-margin indicators for the first line and the subsequent lines move together. That’s fine if you rarely indent (or reverse-indent) the first line of a paragraph. But it is literally a drag if you always use indents: first you move the pair of indicators to the indented measure and then you slide the second-line(s) indicator back to the left margin of the text. To move the indicators independently, hold down the Shift key while you drag one of them (see “The Rule of Formats”).

Making Room in Boxes
- I like to leave a sizable blank space inside a boxed paragraph, but if I press Return, the box closes abruptly after the last typed line. I add space by using the Tab key to extend the paragraph without closing off the box (see "Little Boxes").

Paul B. W. Miller
Salt Lake City, Utah

- To add blank lines to boxes, hold down the Shift key while you press Return. A left-pointing arrow appears for each Return.

Marsha Seeley
San Francisco, California

Pagination Oddities
- Version 3.0 sometimes produces long blank spaces in a printed document that don’t show up on screen. The prerelease version of 3.01 we tested has apparently solved the problem, but to fix a spacey file you’ve created in 3.0, Shift-Repaginate (Shift-⌘ J) once and then save the file in 3.01.

Symbol Font Nuances
- The new Word includes a special version of the Symbol font that you should install in your System file before doing any lengthy work involving formulas. The standard Symbol font produces occasional glitches.

Dick Grant, M.D., M.P.H.
Sudbury, Massachusetts

Editing Outlines
- The outline design makes it difficult to add subheadings in two places: immediately after a subsection (that is, a heading

(continues)
Award-winning interactive graphic involving mysterious challenging powerful boggling

Award-winning interactive graphic involving mysterious challenging powerful boggling animated ghastly haunting spooky deadly gripping

New interactive graphic involving mysterious challenging powerful boggling animated ghastly haunting spooky deadly gripping horrifying gory uncanny diabolical petrifying maniacal awesome

In 1986, Deja Vu was named Graphic Game of the Year by Family Computing and elected to Steven Levy's "Game Hall of Fame" in MacWorld.

Uninvited was chosen Entertainment Product of the Year in '86 by MacUser and also named Best Macintosh Game by Omni.

The best is yet to come. Presenting Shadowgate.

In Shadowgate, as the last in an ancient line of Kings, only you can destroy the evil warlock and thwart his plans to raise the Titan Behemoth.

Up for a little one-on-one with some dragons, demons, trolls, and monsters? Just bring along your courage. The mayhem is on the house.

Mindscapes new way to give thrill-seekers the willies.

Mindscapes software that challenges the mind.

Visit your retailer or call 1-800-221-9484 (in Illinois 1-800-942-2313) for VISA or MasterCard orders. To purchase by mail, send VISA or MasterCard number with expiration date, check or money order for $49.95 plus $3.00 for shipping and handling for each title ordered to Mindscape Inc., P.O. Box 191, Northbrook, IL 60065. Allow 3-5 weeks for delivery.

Lawyers will enjoy this. © 1987 Mindscape, Inc. Mindscape is a trademark of Mindscape, Inc. Software copyright © 1986, 1988 and 1987 ECW Simulations, Mindscape is a trademark of Apple Computer, Inc.
Here's a glimpse at the contents of Paul Miller's pared-down 400K two-disk set. Miller's arrangement even lets Word version 3.0 operate its spelling checker on an unenhanced 512K Mac.

with all its subheadings collapsed) and after a paragraph of body text. To add something in the middle of an outline, position the insertion point at the beginning of the paragraph that follows the new material's intended location. Press Option-Return to add a new paragraph.

This technique doesn't work at the end of an outline, however. If you want to add text there, press Option- (period) to advance the cursor to the end, and then press Return.

Stanley K. Dorst
Pittsburgh, Pennsylvania

Headers: Beware of Colons

- Colons in headers produce line breaks in table-of-contents entries. Use slashes or type emphasis to distinguish parts of a header to avoid unwanted line breaks on your contents pages.

The Monster Index

- I found indexing a 265-page book an exercise in frustration until I discovered a workable shortcut. I indexed the book in three parts and exported the parts to OverVue 2.0, combined and sorted them, and returned to Word for final formatting.

Gary Magnum
Fair Oaks, California

- A Microsoft representative says chaining files works better in 3.01 than it did in 3.0 but adds that the practical limit is about 1500 index entries.

The 512K Squeeze

- Advice for anyone still working on a 512K Mac: trim down your System file to make room on two 400K disks for Word and its main spelling checker dictionary, with 49K left for documents (see "Word 3.0 Lite"). Use the Font/DAMover to remove all but the Key Caps desk accessory and all but essential fonts. (I left four fonts in several sizes.)

(continues)
There's no smarter, faster input device than PC Scan Plus. It can read words, illustrations or photographs into your Macintosh word processing or desktop publishing programs in seconds. At the click of a mouse. And it can do the same for an IBM® PC.

If these look anything like the papers piling up in your office, you need PC Scan Plus, the new intelligent scanner from DEST.

It’s the fastest way to get information off your desk and into your Macintosh™ Plus, where you can use it.

You see, PC Scan Plus can read a typed page into your Macintosh’s word processing program, completely formatted, in less than a minute.

PC Scan Plus works with MacWrite™, Microsoft™ Word, and the others. It can read most office typestyles, including dot matrix, with accuracy no other scanner can touch.

What’s more, if you’re a desktop publisher, PC Scan Plus can do even more.

Besides words, you can scan photographs, line art, logos and other images into all the top desktop publishing software, PageMaker™, Ready, Set, Go!™ and the rest.

And if all this isn’t reason enough to take a closer look at PC Scan Plus, just give your in-box a quick scan.

Then call us for a free brochure or a demo.

DEST

800-538-7582
In California, 408-946-7100.
Bug Fixes

The consumer outcry about the glitches, bugs, and even tragic flaws of the January release of Word 3.0 inspired one of the fastest revisions in the West. Although it has not been possible to exhaustively test the pre-release version of 3.01 (3.0lg at press time) against our list of problems, the new version appears to offer significant improvements over the initial hasty release. Among the bug fixes (or “changes” and “improvements,” as Microsoft prefers to call them) are printing procedures that enable you to make collated multiple copies, pagination that works without leaving mysterious spaces in a printed document, draft mode printing on the ImageWriter that doesn’t require an outdated printer driver, and a conversion utility that now seems to function. Subjectively, even the beta 3.0lg inspires more confidence than the shipping 3.0 release did; so far, in three weeks of working with it almost daily, I haven’t experienced any problems with under-25K manuscripts.

Make spell-checking a document exhausting so much of a 512K’s memory that in Best quality, printing slows to a crawl. To speed up the pace, after you’ve corrected the spelling, quit Word to clear the spelling checker from memory. Then reopen the document and print it.

Paul B. W. Miller
Salt Lake City, Utah

Speaking of Key Caps, J. P. Godwin of Los Angeles points out that when you choose Key Caps, a special Key Caps menu appears at the right end of the menu bar. Select a font from that menu and the Key Caps show up in the font you want—very handy.

System Software Compatibility

• Upgrade to System 4.1 to avoid problems on the SE, such as keyboard shortcuts that don’t work. Also make sure you have version 3.0 (or later) of the Chooser. If the Chooser seems to forget you’ve already selected the LaserWriter, it may be because the System disk you’re using contains an earlier version of the Chooser. ☐

Choice of Professionals

THE BEST Carry Case Anywhere, Any Price...

• Professional, comfortable shoulder sling. Not painful little pad sold by mail order.
• Closed cell foam like used in football helmets. Not cheap sponge foam sold by mail order.
• Well padded accessory pouch for 2nd disk drive and modem with pocket on back for paper and manuals. Many mail order cheap bags have NO pockets or pouches.
• Inside 3/8” foam dividers for keyboard, mouse and hard disk drive.
• Designed to fit under airline seats. Many competitors won’t.
• Available in attractive colors Navy, Burgandy & Gray that won’t show dirt like black.
• We put hard shell in bottom and in lid for bump protection. Many mail order bags use cardboard.

Don’t trust your Mac to the many “rag” bags being sold now. GET THE BEST.

MacBag™ SE, Plus, 512

MacBag™ Extended

MacPak™ also available in backpack version. PrintBag carry case for ImageWriter.

MacFreighter™

MacCovers®

MacCover® is a registered trademark. MacBag, MacPack are pending.

Diskwallet

Discretionary shipping cases for Mac II, SE, SE Plus or custom made.
• Check your computer on airline or ship it on ahead with confidence.
• Full keylocks, two butterfly locks, ABS framed with aluminum & steel.

Linebacker

643 Industry Drive, Seattle, WA 98188

1-800-228-7042 or (206) 575-1180

Circle 28 on reader service card
If you've ever watched his show Firing Line, you know Bill Buckley to be one of the most articulate, erudite people who ever spoke the King's English. His superior vocabulary makes you lean forward in your chair to keep up with him. If anyone could get by without a thesaurus, he could. But we have his letter praising our comprehensive, contemporary Word Finder. No big words, just a nice letter saying how much he liked it and uses it. Didn't mention the 220,000 synonyms for 15,000 words. Didn't say anything about how in just seconds Word Finder performs the whole cycle of look-up and replacement, so you continue writing without taking your eyes off the screen or your fingers off the keyboard. Nothing about how simple it is—just place your cursor on the word you want an alternate for, and up pops a window of synonyms. Pick a new word and the window disappears, and your new word takes the place of the old word. But he did say: "It's a bloody miracle. Word Finder has changed my life. I never used to use a thesaurus." * To order call 800-828-6293 (in New York State call 716-377-0130).

Word Finder installs as a desk accessory. It is not copy protected.

Retail $59.95
Special Introductory Offer $49.95
New for the Mac!

*Mr. Buckley volunteered this statement about Word Finder, and is not being compensated for his endorsement.

Special Introductory Offer
Rush me Word Finder for $49.95 (Add $2.50 shipping: NY residents add sales tax)

☐ Visa ☐ MasterCard ☐ American Express ☐ Check ☐ COD

Card Number ________________ Exp. Date ___ / ___

Name _______________________

Phone _______________________

Company ____________________

Address _____________________

City _________________________ State __________ Zip ______

Special Introductory Offer

© Copyright 1987, Microlytics, Inc. Word Finder™ is a trademark of Microlytics, Inc. Macintosh is a trademark of Apple Computer, Inc. and is used by Apple Computer, Inc. with its express permission.
Double Helix®
Voted
"Best Database of the Year"
1987 MACWORLD Readers Poll

Double Helix II
Has Arrived!*

*Experience the revolutionary speed, power, and flexibility of the new Double Helix II. Try it risk free for 35 days. Call us at 800/323-5423, in Illinois: 312/498-5615.
(We can also recommend the Odesta Preferred Dealer nearest you.)

Note: Odesta Corporation spent seven years developing the technology of Double Helix II. Odesta has received numerous awards for user support and is known for innovation. Double Helix II gives the power to build business applications without programming and without the restrictions found in other data-based systems. It may be expanded to information networks with the Helix MultiUser Kit and to any of DEC's VAX computers with Helix VMX.
Introducing **Design.**

The first thinking tool for both sides of your brain.

Now there's a powerful graphics and text handling program to help you visualize complex systems. **Design** lets you create understandable graphic representations of projects and processes on your Macintosh™. So you can organize quickly, analyze effectively, and communicate clearly.

Draw flow charts, organizational charts, computer programs, communication networks, presentation graphics and production line processes—in record time. Once you connect one object to another in a diagram, it stays connected, no matter where you move it. **Design** makes it easier to establish, maintain and understand logical relationships.

Build **Design** diagrams up to 999 pages. And arrange them in hierarchical structure. You can also develop successively detailed descriptions within one multi-level diagram. Or hide detail, so the big picture is easier to see. Even edit, manipulate and stylize text inside any graphic object. And create "hypertext" links to organize text across multiple pages.

What's more, you can always upgrade to **Design** development systems from Meta Software. **Design+DA** lets you write Macintosh™ Desk Accessories, mini-applications that extend the power and capabilities of **Design**. And **Design Open Architecture** is a programmable system for developing final applications.

That's the verbal description of what **Design** can do. For a more graphic illustration, look to your right.

---

**Why just draw graphics, when you can draw conclusions?**

For more information about **Design**, or for the name of the dealer nearest you, mail this coupon to Meta Software Corporation, 150 CambridgePark Drive, Cambridge, Mass., 02140. If you can't afford to wait, call us at 800-227-4106. In Massachusetts, call 617-576-6920.

Name: ____________________________

Title: ____________________________

Company: _________________________

Address: __________________________

City ___________________ State ___ Zip: ___________

**Meta Software**

150 CambridgePark Drive
Cambridge, MA 02140
617-576-6920

---

Apple is a registered trademark and Macintosh is a trademark owned by or licensed to, Apple Computer Inc. © 1987 Meta Software Corp.

Circle 675 on reader service card
FWB Software presents utilities for Macintosh hard drives:

**Hard Disk Util™** uploads protected software to hard disks, eliminating the need to insert masters. Improves compatibility with newer machines. Supports most major software packages. PatchDisk™ 2, 3, 4 & 5 available at extra cost. **$89.95**

**Hard Disk Partition™** partitions hard disks, reducing fragmentation, improving access times & allowing users to password protect important files without time-consuming encryption. Allows the Finder™ to more effectively manage many files. **$54.95**

For information, contact FWB Software, Inc., 2040 Polk St. Suite 215, San Francisco, CA 94109. 415-474-8055. Our products are available through your local dealer or directly from us. For direct ordering, include $3 shipping per item ordered. CA residents add 6.5% sales tax. Cash, check, COD, and Visa/MC accepted.

Circle 507 on reader service card
Do you know someone who always seems to have the latest and greatest shareware and public domain software for the Macintosh? Feel left out at parties when the conversation turns to Mac rumors? Find yourself alone on Friday night battling a mysterious bug that won't let you finish the report the boss expects Monday morning?

If you have a Mac, a modem, some inexpensive communications software, and a little free time, you can be in the know by dialing up one of the many electronic bulletin boards for Macintosh users.

You could think of a bulletin board system (BBS) as a permanent user group meeting—at any time you can connect to one to exchange information or to experience a sense of community. BBSs have been around almost as long as personal computers, starting back in the late 1970s. In the last 10 years or so, thousands of bulletin boards have gone online all over the country. A BBS is made up of a personal computer, a modem, BBS software, a lot of dedication by the sysop (system operator, the person responsible for it all), and (most important) participation by the users.

The major difference between a BBS and a commercial online information service like GEnie or CompuServe is the price. A few bulletin boards require a small annual subscription fee (usually $20) and a few others request—but don't require—a small donation to help defray the costs of dedicating so much hardware to the project, but most BBSs are free.

**The Typical BBS**

You'll find the atmosphere on most bulletin boards relaxed and friendly, but BBSs and the information on them vary tremendously—one includes a conference for Grateful Deadheads, for example. As you test the BBS waters, you'll discover that each one reflects the personalities of the people involved.

Most BBSs are divided into two main categories: messages and files. In the message section you can read messages left by others, reply to them, and leave your own. The message area typically contains sections organized by topics. For example, there may be sections devoted to programming, news, and questions answered. This is where you'll find gossip about forthcoming products, timely news of software updates, tips, and advice (often from all over the world), as well as notices of hardware and software for sale and even job postings by companies and recruiters. Depending on the theme of the board, you may also find messages about hobbies, restaurants, travel, politics, the latest medical developments, and more.

(continues)
Statistics prove that successful BUSINESSMEN have strong Extra Sensory Perception; their decisions are based on analysis and INTUITION. IMPROVE YOUR SIXTH SENSE: use MAC-ESP™, a complete method in training non-verbal communication, Extra Sensory Perception and your INTUITIVE POWER (including a chapter dedicated to businessmen).

**SUBLI-MAC™**
offers you the power of Self-Hypnosis, ALPHA WAVES and subliminal thinking to help you TRANSFORM your life, maintain schedules, act easily and at will. Also use MAC-ESP™, the Computer Aided Telepathy software with your friends and know who is in harmony with you.

**CHANGE YOUR LIFE**, do what you decide! CAPTURE THE POWER OF POSITIVE THINKING ON YOUR CONSCIOUS MIND.

**BIO-MAC™**
draws your BIORYTHMS, and indicates your CRITICAL DAYS (did you know it is one of the keys to the SUCCESS of Japanese businessmen?).
The Desktop Publishing Conference

A Seybold Seminar and Exposition

"The event of the year." You heard about last year's Seybold Desktop Publishing Conference. More than 100 new products were introduced, including Ventura Publisher and Aldus PC PageMaker. Steve Jobs declared that Hewlett-Packard was "brain damaged" for selecting the DDL page description language. IBM revealed its desktop publishing strategy. Users blasted vendors for not offering support. Everyone agreed they had not seen so much enthusiasm and excitement in years.

The 1987 Conference will be even better: a lot of new players in the market; a raft of exciting new products; serious work being done by serious users.

The seminar will explore the key issues in this rapidly changing field. Presentations by industry leaders and pioneering users are followed up with tough questions from the Seybold staff and no-holds-barred discussion.


The exposition will fill the 75,000 sq. ft Convention Center and include virtually every vendor from IBM, Apple, Xerox, Hewlett-Packard, Aldus et al. to dozens of innovative new entrants from all over the world. This is the event that will once again define an industry.

Free to seminar participants.

For registration information, contact:

Seybold Seminars
6922 Wildlife Road
Malibu, CA 90265
(213) 457-5850

---

How To / Mac Tools

You have the option of reading a specific message or reading all messages since a certain date—for example, since the last time you logged on. You might find it interesting to capture these messages into a text file so that you can read them later. Don't be afraid to reply to a message if you have something to say. This is a group effort, and everyone will appreciate your participation.

You'll usually find the files area divided by topic, too. You can expect to find sections devoted to communications software, utilities, games, clip art, and so on. This is where you'll find the latest versions of the popular public domain and shareware utilities. The Mac is blessed with a wealth of user-supported software, and the proliferation of BBSs is one reason why.

Getting Started

When you log on to a bulletin board, you are asked for your name. If you've never been on the board before, you then pick a secret password. The sysop may also ask that you fill out a questionnaire before you're validated for the board. Some sysops have other methods of validation that require you to wait a day and call again before you're okayed. Being validated simply means that you have access to the files available for downloading and that your time allowance is increased, usually from 15 minutes for nonvalidated callers to one hour for validated ones. The next time you call, you only have to give your name and password to gain access to the system.

One of the first things you notice is that bulletin boards don't look much like the standard Mac environment. In fact, many boards are running on MS-DOS machines. Instead of the familiar pull-down menus, you see a bewildering array of menu selections, but don't be put off. They're usually organized logically and have a help option available for those who get stuck.

After you log on, read the bulletins, which contain information about the system. Most sysops include a special bulletin for first-time users that describes the system and how to use it. The sysop may also have some special rules for the use of the system. Obey them. Remember, you're a guest here.

In Pursuit of Bargains

Long-distance phone bills can mount up quickly, as anyone who's ever attempted to keep up a long-distance romance al-
If you've ever outgrown your accounting software, it wasn't ours.

Because ours can't be outgrown.
That's right. The SBT Database Accounting Library is the first business software package that works just as well whether your business is small or big. Here's why.

One.
It's modular. You can start with the modules you need today. Then add more as your needs grow. And all the modules work together.

Two.
It runs with McMax and dBMAN database management software (high-performance dBASE III work-alikes for the Apple Macintosh).* So you get all the power and flexibility of the most advanced and best selling Database Accounting Software.

Three.
You can customize our software in just hours to fit your business. No matter what size or shape your business is. Because we give you the source code (the key to changing our software) absolutely free.

The SBT Database Accounting Library. Try to outgrow it. We dare you.

Call today for our demo disk and brochure. (415) 331-9900.

---

**THE SBT DATABASE ACCOUNTING LIBRARY.**

<table>
<thead>
<tr>
<th>Module</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>dProfessional</td>
<td>$395</td>
</tr>
<tr>
<td>dOrder</td>
<td>$295</td>
</tr>
<tr>
<td>dInvoice</td>
<td>$295</td>
</tr>
<tr>
<td>dStatement</td>
<td>$100</td>
</tr>
<tr>
<td>dPurchase</td>
<td>$295</td>
</tr>
<tr>
<td>dPayable</td>
<td>$395</td>
</tr>
<tr>
<td>dPayroll</td>
<td>$395</td>
</tr>
<tr>
<td>dLedger</td>
<td>$395</td>
</tr>
<tr>
<td>dAssets</td>
<td>$295</td>
</tr>
<tr>
<td>dProject</td>
<td>$395</td>
</tr>
<tr>
<td>dBackup</td>
<td>$65</td>
</tr>
</tbody>
</table>

---

* dBASE III is a registered trademark of Ashton-Tate, Inc. McMax is a trademark of Nantucket, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. dBMAN is a registered trademark of VersaSoft.

One Harbor Drive
Sausalito, CA 94965 (415) 331-9900
Telex 9102404708

Circle 630 on reader service card
Full House

It's a safe bet that no matter what Macintosh™ model you have, Dove Computer has a MacSnap™ memory expansion product that matches your needs. That's because Dove has the most extensive line of memory and productivity enhancement products available. From our universal SCSI port for your 512 to 8 Megs for your Macintosh II, every MacSnap model is engineered to give you greater productivity, superior value and more. We've even gone a step further to insure that you have "upward compatibility." If you enhance your Macintosh Plus to 2.5 or 4 Megs today using our 1 Megabit CMOS SIMM products, you can take the memory with you in the future when you move up to the SE or the Macintosh II. Plus you get the support, quality and technology leadership that we have become known for. And it's all available TODAY! So don't gamble. Deal yourself the unbeatable combination; you, your Macintosh, greater productivity and complete compatibility from Dove!

For more information contact your favorite dealer or give us a call.

DOVE COMPUTER
1200 North 23rd Street
Wilmington, NC 28405
(800)-622-7627
(919)-763-7918

MacSnap is a trademark of Dove Computer. Macintosh, Macintosh Plus, Macintosh SE and Macintosh II are trademarks of Apple Computer, Inc.

Circle 498 on reader service card

How To/Mac Tools

ready knows. If you find yourself addicted to calling bulletin boards all over the country, consider a service from Telenet called PC Pursuit. For a flat fee of $25 per month (billed to your bank credit card), you can call as many bulletin boards as you want in the evenings and on weekends, as long as the boards you're calling are in cities supported by PC Pursuit.

PC Pursuit's major drawback is the time required to use it: transferring files takes almost twice as long as a normal call, since your data has to travel through several extra modems to get to its destination. Also, only 300 and 1200 baud are currently supported. Even with these limitations, the service can be a great money saver for the active BBS user. The advent of PC Pursuit has enabled hundreds of people to participate in long-distance boards that they otherwise couldn't afford. For more information on PC Pursuit, call 800/835-3638, or dial its bulletin board at 800/835-2987.

Call Waiting

When you communicate with another machine over the phone, you must disable call waiting. If you don't, the first incoming call will break your connection with the remote computer, no questions asked.

If your phone company has upgraded to electronic switching exchanges, you can temporarily disable call waiting for the duration of any call by preceding the number you're dialing with *70, or 1170 if you're using a pulse phone. (To find out if it will work, just put the code in front of a number when you dial. If the service isn't available, you'll get a recorded message that your call can't be completed as dialed.)

You'll need to send the modem a pause between the command to disable call waiting and the number you're dialing. With the Hayes command set, the pause command is a comma, for example:

ATDT *70,555-1212

Ideally, you should have a line that you use only for the Mac so that your voice line won't be tied up for hours at a time. The cost of installing a second line varies from phone company to phone company, but you can expect to pay about $200 for the installation and about $15 to $20 per month for the line itself, excluding any long-distance charges.

A Select Few

The content and quality of bulletin boards vary, but some stand out from the crowd. The friendliness and dedication of (continues)
While other manufacturers are making the claims... Microtech delivers the facts!

A lot of manufacturers are out there claiming to be the first, the fastest, the smallest, the quietest, etc., Microtech, as one of the first drive manufacturers in the Macintosh market, when only a handful existed, could prove many of these claims false, but rather than make claims, we prefer to devote our time and expertise to delivering our customers the facts.

Micro MAC 30 A 30 megabyte SCSI hard drive equipped with dual ports for daisy-chaining along with an external dip switch for quick and easy address changes. Coming soon: Micro MAC 45.

SPEED Few drives in its class can match or beat the Micro MAC 30's speed; none for the price.

SLENDERNESS Fitting snugly beside your Mac Plus, measuring only 3½" x 5½" x 8", the Micro MAC 30's unique profile will not overstep your Mac boundaries. Sound sensitive Mac enthusiasts will appreciate Micro MAC 30's quiet subtlety as well.

SECURITY A special "Micro Lock" feature auto locks and locks the Micro MAC 30's heads in an area not used for data storage, securing your data from loss or damage.

Micro MAC 800 You saw it first, as the Mac555, at the Boston '85 Macworld Expo, in the pre-Mac Plus days.

SATISFACTION The Micro MAC 800 floppy disk drive, soon to enter its "3rd" year of production has long been satisfying Mac users of all sizes-128K, 512K, and Mac Plus-with its versatility and reliability. Now even quieter than ever; at a new low price.

NOVA 20, 30 or 50 The Nova series SCSI drives offer the same extra features as the Micro MAC 30 including "Micro Lock", daisy-chaining and external dip switch - all with an added bonus . . .

SAVINGS Compare and Save...

NOVA 20 ............ $569
NOVA 30 ............ $689
NOVA 50 ............ $999

MICROTECH EXTRAS All Microtech drives are AVAILABLE NOW for shipping, come complete and ready to use, with these extras:

ONE YEAR WARRANTY on all drives
TECHNICAL SUPPORT call TOLL FREE
FREE SHIPPING UPS ground in Continental U.S.

ASK ABOUT OUR MEMORY EXPANSION KITS

Now that you've got the FACTS, we'll let you be the judge... Microtech invites you to TEST and COMPARE...ask for details on our 30 day Money Back Guarantee. Call now and take advantage of Microtech's years of experience in the Macintosh market and our ability to deliver quality products at the lowest possible price.

800-325-1895 In CT call 203-488-8993
Dealer inquiries call Microtech International, Inc. 800-626-4276

Circle 470 on reader service card
How To/Mac Tools

The sysop and users, the extent of the file section, and the activity in the message areas account for the popularity of these BBSs.

Here's a sample of some of the best Mac-oriented bulletin boards around the country, along with a description of each one. These boards share two things: they're all very popular and they all benefit from the active participation of both the sysops and the users. All of these boards support 300-, 1200-, and 2400-bps transfer rates.

Of course, after this article hits the newsstands, these services may become even busier. If you have trouble logging on, wait a few weeks and try again.


M.A.G.I.C. (Macintosh and GS Information Center) started last October. It has quickly become one of the most popular boards in the country with over 450 registered users. As with other boards listed here, you may have difficulty getting on, since some days this BBS receives 60 to 80 calls.

The message section is very active, containing lively conversations about a variety of subjects including the potential of various baseball teams during spring training and valuable hints about how to play Dark Castle. M.A.G.I.C. is popular with PC Pursuit users, so there are lots of messages from all over, particularly Washington, D.C.; Seattle; and San Francisco. Sande's board is also one of the first anywhere to have a separate file section devoted to public domain and shareware software for the Apple IIgs.


MacCircles started in May 1985 on a Lisa 10 that gradually acquired three Profile hard disks (which must be some kind of record). One day O'Connor came home to find all the disks completely full, and she knew it was time to change strategies. MacCircles now runs on a Mac Plus with a Tandy 80 and a Bernoulli 20/20, using Red Ryder Host.

O'Connor is currently experimenting with exchanging messages with a BBS in her hometown, Tucson, Arizona. Comparing messages from the two boards is a good way to tell how people's attitudes about bulletin boards seem to change from
Join the decision makers who get scoops and early warnings from SUBROUTINES, David Bunnell's Newsletter from inside the Personal Computer Industry. Being in this select group and get critical information not available to outsiders. Be the one to know who's doing what long before others find out elsewhere.

Month after month, you get the how and why behind computer industry events: advance news, hot projects, stock analysis, product developments, interviews, trade show reports, market trends. All flavored with Bunnell's penetrating insight and wit. Subscribe to SUBROUTINES. Be in the know, produce results, and float on up.

Get your information from an inside source.

Subscribe now to SUBROUTINES. Get a FREE copy and special savings. Call TOLL FREE 800-222-2990

Send me a free copy of SUBROUTINES. If I like it, I'll pay $24.95 for a 6-month trial subscription—a 75% savings over the $105 annual rate. If not, I'll write "cancel" on the bill, return it to you, and owe nothing.

Name ____________________________
Company ________________________
Title _____________________________
Address __________________________
City/State/Zip ______________________


SUBROUTINES, P.O. Box 10735, Palo Alto, CA 94303-9909.
Communications Basics

Modems come in a variety of flavors, but the two important features are Hayes compatibility and baud rate. Make sure your modem accepts the basic Hayes command set, since most of the communications programs available for the Mac work best with these commands. Baud rate simply measures speed, the rate at which you can transfer information to and from another computer. A 300-baud modem may suffice for reading messages, but sending or receiving even a short file at this slow speed can use up all your allotted time on a bulletin board.

Much more common are 1200-baud modems, which you can buy from a variety of sources at very reasonable prices. 2400-baud modems are even more desirable, but you'll pay two to three times as much for the privilege of sending and receiving data twice as fast. If you frequently call bulletin boards long distance and pay by the minute, 2400-baud modems will be your best buy.

(Most sysops report that about 10 percent call at 300 baud, 25 percent at 2400 baud, and the rest at 1200 baud.)

Communications software includes commercial, public domain, and shareware offerings. Perhaps because BBSs are partly responsible for the explosion of user-supported software, you might feel at home using one of these, such as *TermWorks* or *Red Ryder*: I recommend *Red Ryder*, both for its incredible flexibility and because it supports the Xmodem form of file transfer available on many BBSs—it's faster than the Xmodem standard.

(Note to sysops: Contact Alpert for subtle but effective solutions for dealing with that problem caller you may have. Leave him a private message.)

**Check-In** 305/232-0393. Based in the Miami area. Sysop: Dave Game. Runs on a Mac 512KE with *Red Ryder* Host.

Check-In began last October, and it's already one of the most active boards in the country. This board focuses on late-breaking Mac news and gossip, perhaps reflecting the personality of the sysop, who's a local Miami TV news personality.

If you want to find out about the latest news in the industry, *Check-In*, which features 40 to 50 bulletins every month, is one of the best places to do it. For example, *Check-In* regularly were among the very first to hear of Guy Kawasaki's departure from Apple Computer. Game spends a lot of time on this board, weeding out the boring and unnecessary files that you often find on the commercial services.
MacQueue I and MacQueue II
415/661-7374 and 415/753-3002, respectively. Based in the San Francisco area.
Sysop: Leo Laporte. Runs on IBM PCs and clones with two Seagate 20MB hard drives.

There are two MacQueue boards, and each is a mirror image of the other. MacQueue runs on IBM PC clones with the unique Fido software that was originally developed by Tom Jennings. Fido boards throughout the country are organized into networks that share information with each other. Laporte has long been involved in the development of the Fido EchoMac conference and is the West Coast coordinator.

Fido EchoMac sounds complicated, but it simply means that during the wee hours of the morning the boards on the network automatically call each other and share their message base. So if you ask a question in the EchoMac section, you may get several answers from the other side of the country in a day or two.

MacQueue I and II contain an incredibly large public domain and shareware software library (over 70MB). There are lots of messages of interest to software developers, and the message section also contains the usual Mac gossip and questions-and-answers about Mac-specific problems.

Rumor has it that employees of well-known Silicon Valley computer firms regularly log on to MacQueue under assumed names and set participants straight on pending product announcements. While this can’t be verified, MacQueue I and II are among the best of the Mac grapevines.

MacQueue is an excellent example of a well-organized board. The latest uploads are always listed, along with the Top Ten downloads of the week. Laporte is a master of the capsule file description; you never have to guess what’s in a file. Be warned, however, that MacQueue is one of the busiest boards in the nation, so even with two lines you’ll need a little extra patience to get on. Perhaps that’s what gave Laporte the idea for QDial (see “BBSs Made Easy”).

DeskToppers 312/356-3776. Based in the Chicago area. Sysop: Randy Bennett. Runs on an IBM PC clone with 100MB of hard disk storage, using TBBBS 2.0 software. Expects to install multiple-phone-line capability by the end of the year.

DeskToppers started in July 1986 and now sports nearly 500 public domain and shareware programs. This board offers lots of information about desktop publishing. The service keeps an updated list of all the Mac bulletin boards in the country and isn’t afraid to say which ones are the best. If you’re just starting out and are looking for a list of boards in your area, check this one first.

A unique feature of this board is the monthly Eye for the News Macintosh magazine. It’s available for downloading and in traditional printed form. DeskToppers’ logical organization of the menus and the message sections will make you feel comfortable right away.

Regional Treats
If you’d rather try a local bulletin board, or if the acclaimed BBSs on our list are all tied up, try one of these bulletin boards recommended by DeskToppers sysop Randy Bennett. The BBS software each service runs is listed to edify other sysops and the equally technically minded—people who call in to the BBS can use any communications software as long as the baud rates match up.

(continues)
Not all reviews are created equal.

Some reviews are press releases. Some are synopses. Some are just paragraphs or rating symbols that can't possibly tell you enough. MACWORLD gives you in-depth reviews. Comparative. Analytic. Selective. Solutions-oriented. Precisely the ones you want.

Month after month, our experts work programs thoroughly to give you the information you need to make intelligent, productive choices.

MACWORLD, The Macintosh™ Magazine.
More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE.
☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME _________________________
COMPANY _______________________
TITLE __________________________
ADDRESS _________________________
CITY __________________ STATE __ ZIP __

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

MACWORLD

More for less. Honest.

☑ YES, send me one year (12 monthly issues) of MACWORLD for only $24. That's nearly 50% off the annual cover price of $47.40 and $6.00 off the regular subscription rate of $30.00.

SAVE EVEN MORE.
☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

NAME _________________________
COMPANY _______________________
TITLE __________________________
ADDRESS _________________________
CITY __________________ STATE __ ZIP __

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires February 29, 1988.

MACWORLD
BBSs Made Easy

You can choose from a variety of tools to help you get the most from your time on BBSs. You'll find these shareware utilities—indispensable for serious BBSing—on many bulletin boards, on Genie, and offered by most user groups. Remember, if you use shareware, send in your money.

QDial

Since most bulletin boards have only one phone line, it can be quite a task to log on to some of the more popular ones. You may quickly run out of patience when you find your Mac tied up redialing a number. You can solve this problem with the desk accessory QDial, which continues to dial while you use your Mac for other things (though you can't use another communications program while QDial is working). When QDial makes a connection, it beeps at you and holds the connection long enough for you to close whatever document you're working on and load your communications program.

MockWrite

MockWrite, a desk accessory from CE Software, allows you to write and edit ASCII text. During a communications session, you can use it to compose a message with standard Mac editing techniques and then upload the finished message to the bulletin board.

Packit III

You'll find Packit III indispensable for uploading and downloading files. Packit III allows you to group several files together into one file (say an application and its documentation) and, if you choose, compresses the files so that you can send and receive them more quickly. Lots of the files available on BBSs are stored in Packit III format, so you'll need the program to unpack the files you've downloaded.

In the Midwest: Royalty Mansion in Indiana (300/1200/2400 bps), 219/923-2486. Uses MacMansion software.


See Where to Buy for product details.

MockWrite, a powerful program of its kind.” -MacUser, January 1987

$74.95 (+ $3 s/h) for a limited time only! Version 2.1 scheduled for release in the Fall will contain many new features & cost more.*

HAMac trade-in still available. Requires 512K Macintosh minimum (Mac Plus, SE & II compatible)
Introducing the 19-inch Viking 1 for the Macintosh™ SE.

The critics have praised the Viking 1 as "magic" and "the clear winner" for desktop publishing on the PC. Now this exciting new monitor is about to change the look of desktop publishing on the Macintosh.

Here's why:

Introducing "Publishing Resolution." The Viking 1's 19-inch screen allows for a full two-page layout. Its ultra-high 1280 x 960-pixel resolution provides a precise, tack-sharp image—unlike lower-resolution monitors that make it tough to read the fine print. Or higher-resolution monitors that create letters too tiny and fuzzy to read. And the Viking 1's unique square pixels assure that screen and laser-printer characters match perfectly.

Eliminates Flicker. Some monitors have an annoying flicker that can frazzle your nerves. The Viking 1, with its exceptional non-interlaced 66 Hz refresh rate provides rock-solid stability.

Fast Screen Update. With over a million pixels, screen updating can get sluggish on some monitors. The Viking 1 accelerates screen update by avoiding processor wait states.

Gets Your SE Involved. With most large-screen monitors, your Macintosh is turned off—or just a repository for surplus windows and toolboxes. With the Viking 1, your Mac SE can serve as a 7x11-inch scrollable extension to the large-screen image. Or "roam and zoom" in the large-screen image, zooming in at two levels of "fat bits" magnification of whatever the cursor is pointing to.

IBM® Compatibility. The Viking 1 is the only monitor that's compatible with both the Macintosh SE and the entire IBM line of PC/XT/AT and PS/2 computers. So you can stay flexible and grow.

Spend A Minute With Moniterm. That's all it takes to really visualize the benefits of the Viking 1. For a screening, contact the dealer in your area, or return this card for more information.

*Jim Seymour, PC Week **Jim Felici, Publish!


Macintosh is a trademark of Apple Computer Inc. IBM is a registered trademark of International Business Machines Corporation. "Publishing Resolution" is a trademark of Moniterm Corporation.
Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

**Accountant Inc.** version 2.0 has fully automated period- and year-end procedures. Period-end shows net income in current inventory in balance sheet; year-end automatically closes income and expense accounts, deducts withdrawing account balance from net income, converts existing net income to equity; and updates the inventory balance in the general ledger. Zoom feature has been added to document windows, journals will now allow option of calculating taxes automatically. Revised manual. Softsync, Inc., 162 Madison Ave., New York, NY 10016, 212/685-2080. Free; $299.95 new.

**CalendarMaker** version 3.0 will read Smart Alarms, More, and standard text files. Can import multiple calendar files to create a master calendar. Individual text styles can be mixed within a single day's notes. Condensed and Expanded fonts have been added to the style menu, and you may choose from 24 different icons to represent a calendar month. Full calendar screen preview and floating notes capabilities. Month title and credit line can be modified. Julian date option. Prints text files. CE Software, 80170 Third St., Des Moines, IA 50312, 515/224-1995. $10; $39.95 new.

**Comic Strip Factory** version 1.5 has a fully implemented Undo function, Autoscrolling, a Transfer command, and an enhanced user interface. Also includes PartMaker II, a utility that converts graphics from all popular paint programs into comic-style graphics. Foundation Publishing, 10801 Yellow Circle Dr., Minneapolis, MN 55443, 612/935-4250. Free; $89.95 new.

**ConcertWare +** version 4.0 and **ConcertWare + MIDI** are completely revised. The Instrument Maker module now includes an instrument library with visual representation and audio capabilities so that you can test sounds within the library. In addition to a new volume control, the Music Player now offers a tempo control that lets users increase or decrease tempo in precise increments. Menus have been rearranged. The Music Writer now includes 32nd notes and a ruler for formatting selections such as adjusting space between staves. You may add free-form text for notation and lyrics, and import PICT files. New Find Text/Measure facility. Header includes extra line for copyright notice. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-1990. $20 to $70 depending upon version's current and level of upgrade; **ConcertWare + $69.95 new, ConcertWare + MIDI $139.95 new.**

**Copy II Mac** version 6.5 supports up to three 3.5-inch drives on the Mac SE. Lets you recover the file name, type, creator, and date when undeleting files. Also includes CPS TagFix, which corrects a bug in the 128K ROMs and improves performance of the Mac SE's upper drive. Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97221, 503/244-5782. $15 plus $5 shipping and handling; $39.95 new.

**DiskTop** version 2.0 finds documents on all attached disk drives. Launches programs or documents by double-clicking and copying multiple files or folders. Allows you to access Shut Down from the Apple menu. CE Software, 801 73rd St., Des Moines, Iowa 50312, 800/523-7638. $7; $39.95 new.

**DNA Inspector II +** is HFS compatible. F-key equivalents have been added. The restriction enzyme analysis routine can construct minimaps for all the enzymes in the current table, and can produce an ImageWriter printout of 100 aligned maps of your DNA. Now includes a sliding base composition routine and a powerful search feature. The 19 separate program modules have been combined into 5, and you may choose an adult male or female synthesized voice. Textco, 27 Gilson Rd., Box 180, RR2, West Lebanon, NH 03784, 603/643-1471. $295 (with $245 rebate for returning original disks); $295 new.

**MacInUse** version 2.0 is compatible with AppleShare and other network products. Includes an F-key feature that allows you to trigger the recording of tracked data without quitting an application. Can track applications running under (continues)
Open your eyes and see just how many subjects are covered in the new edition of the Consumer Information Catalog. It's free just for the asking and so are nearly half of the 200 federal publications described inside. Booklets on subjects like financial and career planning; eating right, exercising, and staying healthy; housing and child care; federal benefit programs. Just about everything you would need to know. Write today. We'll send you the latest edition of the Consumer Information Catalog, which is updated and published quarterly. It'll be a great help, you'll see. Just write:

Consumer Information Center
Department TD
Pueblo, Colorado 81009


Mentor (formerly called MacLightning) checks 140 words per second, has an expanded 100,000-word Merriam-Webster dictionary, and does not limit the number of words you can add to it. Mentor is capable of complete hyphenation and is network-compatible. Mentor Plus has a 75,000-word dictionary, including definitions. Target Software, 14206 S.W. 136th St., Miami, Fl. 33186, 305/262-0892. Mentor $25; $99.95 new. Mentor Plus $100; $199.95 new.

MicroPhone version 1.1 improves VT100 emulation by supporting selective text styling and lets you use the Watch Me function. Compatible with the new desktop bus keyboards. The new version also has a faster screen update for 2400-baud modems. Mac SE- and Mac II-compatible. Now bundled with Glue from Solutions International. Software Ventures, 2907 Claremont #220, Berkeley, CA 94705, 415/644-3232. $10 or $55 for upgrade and Glue; $149 new.


NutriCalc Plus corrects bugs and includes over 150 new foods, including fast foods and name-brand frozen foods. CAMDE Corp., 4135 S. Rural Rd. #331, Tempe, AZ 85282, 602/821-2310. Free; $225 new.

Object Logo version 1.5 copies, pastes, and prints graphics. The new version has improved event-handling. Supports Macintosh and the Mac's four-voice synthesizer. Coral Software Corp., P.O. Box 307, Cambridge, MA 02142, 617/547-2662. $5; $79.95 new.

The Print Shop version 1.2 fixes a major bug that may affect hard disks. Broderbund Software, 17 Paul Dr., San Rafael, CA 94903, 415/492-3200. Free; $59.95 new.

Real Estate Investment Analysis version 5.1 evaluates real estate investments under the Tax Reform Act. RealData, 78 N. Main St., South Norwalk, CT 06854, 203/255-2732. If purchased after Nov. 1, 1986, $28; before Nov. 1, 1986, $48; all versions preceding 5.0 $98 with return of original disks; $195 new.

Thunder version 1.1 is approximately three times faster than the previous version. Now compatible with More 1.1, Acta, and Microsoft Works. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. $15 with return of original disk, plus $3 shipping and handling; $49.95 new.


Send upgrade announcements to Updates, Macworld, 501 Second St., San Francisco, CA 94107.
For Mac Savings: 1-800-MAC-DISK

Only $249 Each 1MEG Simms for the MacPlus, MacSE and MacIntosh II

Software
Cricket Draw 175.00
Dark Castle 32.00
Dollars and Sense 99.00
Double Helix 285.00
FileMaker Plus 159.00
Financial Plus 218.00
Fontographer 2.2 249.00
FullWrite CALL
GraphicWorks 1.1 69.00
Hardball 29.00
Intermail 236.00
LaserPaint 312.00
Lightspeed C 125.00
Lightspeed Pascal 99.00
Mac3D 2.0 99.00
MacCalc 83.00
MacGolf 37.00
MacLink Plus 124.00
MacMoney 54.00
MacRacquetball 38.00
MindWrite 179.00
Microsoft Word 3.1 239.00
Microsoft Works 185.00
NFL Challenge 89.00
Omnis3+ 280.00
Parameter Manager CALL
Ragtime 199.00
Reflex 55.00
Scoop 310.00
Shadowgate 36.00
Smart Alarms 33.00
SuperLaserSpool 98.00
SuperPaint 55.00
Trapeze 175.00
Word Tools 48.00

Hardware
Hard Disk Drives:
- Magic30 699.00
- Magic91 (Mac II) 1599.00
- MacBottom 45MB 1239.00
- ProApp20S 649.00
- Magic 20MB Tape 699.00
- Magic 60MB Tape 899.00
- MagicModem 1200 149.00
- Numeric Turbo 109.00
- Turbo Mouse 95.00
- MacFan 95.00

Software Rentals
Try a software product before you buy it. Rentals are only 1/5 of the purchase price.

Upgrades
- 68020 495.00
- 68020/68881 695.00
- SCSI Port 69.00
- 512K 99.00
- 128K-1024K 249.00
- 512K-1024K 249.00
- 512K-2048K 399.00
- 512K-4MEG 795.00

Software

Hardware Bargains!

30-Day Money-Back Guarantee

Disks and Accessories

Disks
- Sony SS Boxed 10.60
- Sony DS Boxed 15.80
- Sony SS Bulk .99
- Sony DS Bulk 1.34
- MacDisk SS Bulk .95
- MacDisk DS Bulk 1.25

Ribbons
- Black Ribbons 2.95
- Colored Ribbons 4.50
- Multicolored Ribbons 9.00

Accessories
- The Macintosh Bible 21.00
- MacPlus Bag 59.00
- Mac SE Bag 75.00
- Image II Bag 55.00
- Phone Net/Easy Net 39/34
- Disk File/30 6.95

Software

MacProducts USA™

9709 Brown Lane Suite E Austin Texas 78754 512-832-0335

Circle 459 on reader service card
Macworld Directory

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

RATES: Listings are accepted for a three-time consecutive insert at a rate of $850. We offer a six-time insert at $1450 that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.


### Accessories

**O Bags**

Cordura Bag for Mac SE
- Organize Mac components for easy access, with padded interior compartments.
- Tough Cordura® & resilient foam padding for protection.
- Quality material & carefully crafted construction—guaranteed.
- Ask about our ImageWriter II case.
- Call your local dealer today! For the dealer nearest you, call us or write. Dealer inquiries invited.

West Ridge Designs, 305 NW 12th Ave., Portland, OR 97209, 503/248-0055

**O Cables**

Mac Lock/Mac Cables
Mac Lock, finest security kit for Mac+/+, secures Mac, keyboard, mouse, 2nd drive, modem, & printer. Attractive red vinyl-covered steel 3/8" cables. Lock included. No tools required. No back guarantee. Also, IBM, Apple, etc. $40. Mac Cables provide any length custom cables for Mac+/+ (incl. keyboard) or almost any computer need. $20 & up.

Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/595-4838

**SCSI Cables**

ARTSOFT manufactures and stocks these Mac cables:
- Mac-SCSI $4.95
- SCSI-SCSI 3' $8.25
- SCSI-SCSI 6' $11
- Mac Plus/Modem 3' $4.95

Custom logos and other lengths available for OEMs. Call for price quotes & catalog. (Qty 50+)

ARTSOFT Inc., 3550 North 1st Ave. #330, Tucson, AZ 85719, 602/293-6363

### Hardware

**MACOPENER**
The finest one-piece tool to open the Macintosh case. Do your own upgrades, installations, adjustments, and repairs. No moving parts. One year warranty, parts and workmanship. Suggested list $19.95 + $3 shipping and handling. Dealer inquiries welcome.

Central Products Corp., 2211 Norfolk #518, Houston, TX 77098, 713/529-1090

**O Mouse**

RealClean®/MouseEase™
New! RealClean mouse cleaning kit gets grime off internal rollers. Special tool advances and scrubs rollers. Includes tweezers & cleaning solution. $14.95 + $2 s/h. For all Apple mice. From the makers of MouseEase, teflon paws for $12. Plus Apple mice. $2.95 + .50 s/h. CA res. add sales tax. Send check to: Trackline Design, 250 Cooper St., Palo Alto, CA 94301, 415/322-2257

### Supplies

**O LaserWriter Toner Recharge**
Don't throw out empty toner cartridges. Sell them to us. Cartridge $6.50, cleaner $3, & box + packing $50. PRINTERS: Apple LaserWriter, HP & more. COPIERS: Canon PC models. BUY OUR RECHARGED CARTRIDGES $50, Blu/Ben $70. We supply empty cartridge & felt cleaner. QC test sheet provided. Support available.

Mihlin Computer Consultants, Inc., Laser Cartridge Division, 3770 Plaza Dr. #1, Ann Arbor, MI 48108, 313/663-9800

**O Laser Cartridge Recharge!**

$3 Save a lot of money recharging laser-printer toner cartridges for Hewlett-Packard LaserJets, Canon, Apple LaserWriter, Corona, QMS. Recharged cartridges are reconditioned to work like new but last 20% longer. Money back guarantee. Send $40 per cartridge plus $5 s/h. Monthly discounts.

Toner Technologies/Laser Systems, 7 North Main, PO. Box 407, Kaysville, UT 84037, 801/544-3090

### Advertising

**O Novelties/Premiums**

Create a You-nique Gift
YOUR logo or artwork on our gifts
- L.G. UMBRELLA $44.50/32.50
- AWARD PLAQUE $24.50
- TRAVEL BAG $24.50/19.50
- SWEATSHIRT $17.50/13.50
- T-SHIRT $12.50
- COFFEE MUG $12.50
- MOUSE PAD $12.50/9.50

Apple Corp Xmas gift supplier: $12+ price. Quantity pricing on larger order. Free catalog!

Computer Expressions, 3700 Market St. #308, Philadelphia, PA 19104, 215/222-4400

**O Mailing Lists**

Macintosh Mailing Lists
Macintosh user names & addresses on adhesive labels or as Mac files on diskettes. Over 120,000 names to choose from. Only $5 per name for one-time rental. No charge for selecting, sorting, key coding, media, or delivery. Choose any quantity. This extremely high-quality list is updated daily. Ask for our one-time rental agreement before sending payment.

Semaphore Corp. 207 Granada Dr., Aptos, CA 95003, 408/688-9200

**O Computer Insurance**

SAFEWARE
- Business Computers
- Home Computers
- Overseas Computers
- Leased Computers
- Computers Leased to Others
- Computers Taken to Shows
- Computers Held for Sale
- Others' Computers in Your Care
Call for complete information!

SAFEWARE, The Insurance Agency Inc., 2929 N High St., PO. Box 02211, Columbus, OH 43202, 800/848-3469 (Nat'l) or 614/262-0559 (OH)
**Consulting**

**Custom Developer**

Specializing in integrated systems for legal, medical, sales & corporate mgmt. communities. Macros, templates, custom applications developed using 4th Dimension, *Omnis 3*, *Tempo* Nationwide service through our 24 hr. BBS. Fixed price, T&E, or hourly contract negotiable.

Phoenix Support Systems, 3232 San Mateo NE #199, Albuquerque, NM 87110, 505/765-9666

---

**Hardware**

**Bar Code**

Bar Code/Mag Card Readers

Bar code & mag stripe (credit card) readers for all Macintosh computers, easily connected on the keyboard circuit, requiring no additional program or port; simple but powerful code-39 bar-code printing program for ImageWriter & LaserWriter; magnetic encoder/verifier. GSA pricing avail.

*FPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833*

**Bar Code**

SIMM Modules

- Bring your SE & Mac II up to its maximum memory configuration. These SIMMs utilize state-of-the-art surface mount technology to produce a low-profile compatible module. All modules carry a 90-day warranty. 
- Specc: 1M DRAMS are 120NS in the 20 PIN SOJ package. CMOS components are selected for cooler operation & greater reliability. 
- All inquiries welcome. Call for pricing and information.

*Ehman Engineering, 115 Apache Dr., Evanston, IL 60201, 800/257-1666*

**Bar Code**

**Hard Disk/SCSI**

**Your MAC SOURCE**

90MB hard disk drive and Rodimel 20, 45MB SCSI internal and external hard drives. For all your Mac needs from hard disk, software, peripherals, Mac cases, books, networking and consulting. Call us today!

Your Mac Source, 5600 Roswell Pkwy North #264, Atlanta GA 30342, 404/843-2267, 800/367-7552

**Lisa/Mac XL**

MACsimize Lisa/Mac XL

Dafax provides full service & support for your Lisa/Mac XL. We carry a full line of upgrades, replacement parts & peripherals, including HFS, 20MB replacement hard disks for all Lisas & XLs, RAM upgrades & more. For latest new product information call our toll-free hotline 800/792-7823.

Dafax Processing Corp., 14 North Drive, Malva, NY 11357, 800/232-1751 (orders & info.), 215/574-0357 (PA)

---

**Memory Upgrade**

**Memory Enhancements**

Upgrade your Mac to 512K, 1024K, or 2048K of contiguous memory. SCSI port & fans available. Factory flow-solder techniques used for high reliability. 120-day warranty. Local 20-minute installation or mail order. Dealer inquiries welcome. Call for pricing and information.

*Ehman Engineering, 115 Apache Dr., Evanston, IL 60201, 800/257-1666*

**Networking**

**PhoneNET System**

The PhoneNET system creates an AppleTalk network with the convenience, added distance, & flexibility of telephone wire. PhoneNET supports AppleTalk & can use standard telephone cabling, even existing wiring. Components include: PhoneNET PLUS Connector, the PhoneNET Star-Controller, the TrafficWatch network analysis pkg., & the PhoneNET Check-NET desk accessory. Call for the dealer nearest you.

*Paradigm Computing, 2150 Kirtland St., Berkeley, CA 94704, 415/849-2331*

**CompuNET Connector**

LOW COST-HIGH QUALITY


*Thimber USA Inc., 235 W. 15th St., New York, NY 10011, 800/872-4454, 212/645-7008*

---

**Video**

**MacMonitors/Projectors**

- 17-23 inch hi-res monochrome monitors w/ antiglare, white phosphor, vari scan. When your Mac must be seen in the classroom, trade show, office, etc. Only $195 & $1295.
- Projector systems for the ultimate in Mac viewing pleasure from $395.
- Rental MacMonitors & Projectors avail. Dealer inquiries welcome.

National Data Systems, 2113 Wells Branch Blvd. 8-100, Austin, TX 78728, 512/251-1392, 800/331-5143, 800/252-8286 in Texas

**Free! How to Link Video**

From any Mac (512K, Plus, SE, II) …

- …To large screen MacProjectors™ - Color or B&W, to 10' tall!
- …To king-sized MacMonitors™ - Shows, schools, user groups!
- …To regular TV or VCR for titles
- …NTSC, VHS, Beta, 8mm, Pro!
- …Digitize images in PostScript for LaserWriter half-tone pictures!

Contrex, Ltd., P.O. Box 1450, El Toro, CA 92630, free newsletter 800/443-2751 x 145, technical questions 714/895-6600

---

**Insurance**

**Data Security Insurance**

The “all risk” Personal Computer Policy from DSI includes essential coverage not available with other policies: protection against loss of data (even from accidental erasure), loss of custom programs, & fraud. As low as $35 a year. Coverage can be bound by telephone, 9 to 4 Mountain Time.

*Data Security Insurance, 4800 Riverbend Rd., P.O. Box 9003, Boulder, CO 80301, 303/442-0900, 800/822-0901*
Macworld Directory

MIDI

Call 1/800/FOR MIDI

MIDI for everyone! Start your computer/MIDI system today with discount prices & expert help from FUTURE MUSIC. You don't have to be a pro—most of our customers are just "plain folks" with a home computer and a love of music. Call for FREE CATALOG of Hardware, Software, Synthesizers, 4 tracks and more. All major brands avail.

Future Music Inc., 900 W. First St., PO. Box 1090, Reno, NV 89504, 702/826-6454

Services

- Data Conversion
  - Electronic Data Conversion
    Conveniently translate data files from mainframes, minis, dedicated word processors, typesetters, & PCs (word processing emulated codes, database structures & spreadsheet reports & formulas) to Macs or Macintosh any system. Ultimate technology. Nation's leading firms use our invaluable services!
    CompuData Translators, Inc., 6565 Sunset Blvd. #301, Hollywood, CA 90028, 213/462-6222
  - Tape/Disk Conversions
    Conversion services for your Macintosh, to or from over 800 computer systems:
    - Mag tapes
    - Microcomputers
    - Word Processors
    - Typesetters
    Our conversion capabilities include to or from 3½-inch, 5¼-inch, and 8-inch disks & mag tapes.
    Pictar Computing Services, Inc., 165 Arlington Heights Rd., Dept MC, Buffalo Grove, IL 60089, 312/459-6010

- Desktop Publishing
  - MacTypeNet™
    Mac/PC typesetting. Disk or modem. 300-dot LaserWriter™ output; 655-, 1270-, or 2540-line Linotype™ 1300P output. Composition, page makeup, printing/binding services. Hardware/software sales, services, and support; beginning and advanced training and seminars for Macintosh, PC, and Linotype 100/300 users.
    MacTypeNet™, P.O. Box 52188, Livonia, MI 48152-0188, 313/477-2733

Laser Printing Services

LaserWriter™/Linotype L100 (1270-dpi) output of your Mac/IBM files. Disk or modem. 24 hr. service. Linotype $5 per page ($5.50 volume discount). LaserWriter $5 per pg. Desktop publishing specialists in consulting & design services. Hardware/software sales. Xerox Ventura Publisher for sale at low price. Full offset printing & bindery services.


PC Publishers

The Image Makers: Typesetting—665, 1270, and 2450 dpi on Linotype L100—linotype from MS DOS or Mac. Modem and MCI Mail. Graphs, charts, and slides in full living color. 24-hour turnaround. Deigner on staff.

PC Publishers, 240 East 27th St., New York, NY 10016, 212/532-6895

Desktop Pub. Experts

Use Silicon Valley experts for your manuals, catalogs, and other major publishing projects. We turn IBM and Macintosh files into beautiful camera-ready art. Difficult or large projects. Technical illustrations. Graphics and pastesup. We take IBM disks. TECHDOC created over 20,000 pages last year for Bank of America, Pacific Bell, National Semiconductor and others.

TECHDOC, 23590 Seabury Rd., Los Gatos, CA 95030, 408/353-2603

Graphics

NYC/NJ/Phil./DE Designers

Desktop publishing doesn't have to look cheap! IBM or Mac files, disk or 24-hr. modem, for high-resolution 1300 output through award-winning color printing, binding, & mailing. Impartial system advice, in-depth training, & support for major DTP pkg.s. PostScript itself. Messenger service! Ask for K. Downs.


Laser Typesetting

Professional-quality file output service at competitive prices. Mac or IBM, via disk or modem to our LaserWriter or Linotype. Same-day service. We can also keyboard your copy, from a letterhead to a full-length novel. Also available: complete darkroom services and platemaking for your printer. Write or call toll free.

Hodgins Engraving, Box 597, Batawa, NY 14020, 800/354-6500 (Nat.) or 607/626-8900 (NY)

West Coast Connection!

Upload by disk or 24-hr. modem for 2540-line L100 output, with up to 30 font calls per page. Support all Adobe fonts. Mac & PC software including Ventura, Pagemaker, and most PC word processors. 24-hr. turnaround. Adobe type dealer; beginning and advanced training for Mac, L100 and PC users. Convention service.

Laser Graphix, 314 Las Vegas Blvd., Las Vegas, NV 89101, 800/492-0020, 702-386-2626 (Voice), 702-384-6761 (Fax). (24-hr. modem on line)

Software

Accounting

Payroll-General Ledger

CheckMark PAYROLL and AMS GENERAL LEDGER are full-featured accounting programs for $195 each. PAYROLL calculates all employer and employee taxes. Prints checks and W-2s. User-modifiable tax tables. GENERAL LEDGER has extensive reporting capabilities. Profit centers, budgeting; previous-year balances. CheckMark Software, Inc., P.O. Box 860, Fort Collins, CO 80522, 800/426-2466 ext. 338

Turn-Key Accounting™

- 4 modules that run w/ Macintosh
- RECEIVABLES/ORDER ENTRY—Back order control; prints invoices, delivery slips, aging anytime
- PAYABLES/PAYROLL—Checks, aging anytime
- INVENTORY—PO’s
- GENERAL LEDGER—Posting can be delayed until convenient.

Modules $195 locked, $395 unlocked w/commended listing
Software Products Division, 22612 South Avalon Blvd., Carson, CA 90745-4190, 213/835-6077

II in a Mac™ new Ver. 2.5

RUN Apple II software on a Mac and still use desk accessories & Cut & Paste to Clipboard. Transfer Apple II disks to the Mac by cable or phone. Use UniDisk directly w/Mac drives. CONVERT ApplEworks or any other Apple II data file into standard Mac text files. DEVELOP software using Apple II BASIC & ML. Full 65C02 debugging system built in.

NOT COPY PROTECTED...$149.95

Computer Applications Inc., 12813 Tindley Dr., Raleigh, NC 27614, 919/846-1411

Apple Emulator

Instant Expert™

A simple and powerful Expert System Shell designed to be the easiest to use. The powerful inference engine provides an easy-to-use expert system application query: Forward and backward chaining as well as a unique mixed strategy gives real flexibility to users. The system can explain how and why a conclusion was
reached and give the user special Solution information. $198.
Human Intellect Systems. 1670 S. Amplett Blvd., San Mateo, CA 94402, 415/571-5939

AuthorsHIP

NEW-Course Builder™
Go from concept to code with no middleman. Create stand-alone applications with user input, graphics, animation, and sound. This visual language provides a next-generation development environment. Programming is as easy as drawing a flowchart of your thoughts. Send for a brochure, demo on CompuServe: $300.
TeleRobotics™ International, Inc., 8410 Oak Ridge Hwy., Knoxville, TN 37931, 615/690-5600

Auto Care

MacAuto ™
A complete automotive log book for every car owner. Stores fuel mileage information and maintenance & repair data in a concise format for easy review and editing. Program provides user with statistics on data and will even alert the user that an oil change is required. Also stores all important information about the car.
$25.
GRA Z Software, P.O. Box 87, Spotswood, NJ 08884, 201/254-3959

Backup/Restore

HFS Backup™
Back up (archive) data from your hard disk. Back up/restore the entire disk, selective files, or changes only. Includes/excludes files based on name, class, or data modified. Creates backup templates, saves print file list (hierarchically by folder or alphabetically by file) $49.95. (AppleShare version avail. $149.) MC/Visa or at your dealer.
Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, FL 33614, 813/388-3092, 800/622-2888

Billing

Invoicing/Job Costing
Office Productivity System (O/P/S). For professionals that bill based on time-use. Includes invoicing, timekeeping/productivity reports, job budget/cost tracking, client database with mail merge and accounts receivable. Multiuser capable. 512K Mac with hard or external drive. Available now for $475.
Applied Micrometics, 3 Burnt Oak Circle, Lafayette, CA 94549, 415/283-4498

Attorneys, CPAs—Billing
Professional Time Billing Template
Ideal small/medium office system for billing time or fixed fees. Ready-to-use billings, client letters, lists & reports. Open design allows other uses. Detailed user's guide included. Field-tested. Req. min. 512K Mac & hard disk. $125; combo program/template $325.
Kaldan Enterprises, 511 Estudillo Ave., San Leandro, CA 94577, 415/337-8400, MCI 148-1089

Communications

Mac2624: HP CRT Emulator
Lets your Mac emulate the HP2624, HP2392, and HP2094, reliably running all HP3000 software. Implements HP modes, parameters, keyboard features, and display characteristics within the Mac's mouse menu/keyboard environment. Ultrafast file transfer (with text and graphics conversion options) included $199.
Tymlabs Corp., 211 E. Seventh St., Austin, TX 78701, 512/478-0611, Telex 755820

pcLINK™
A complete Macintosh interconnect solution for VAX (VMS and ULTRIX) and UNIX systems. Provides terminal emulation (VT241, VT220, VT100), file transfer, virtual-disk, and print-server functionality. Supports serial line, remote modem, AppleTalk, Ethernet, or Omninet communication media.
Pacer Software, Inc., 7911 Herschel Ave., #402, La Jolla, CA 92037, 619/454-0565

MAC3000: HP Emulation
MAC3000 provides full terminal emulation of the Hewlett Packard 2624, HP2392, as well as DEC VT100, IBM3278, & TTY Terminals. MAC3000 also offers the ability to communicate with a variety of computers & electronic information services such as The Source, Dow Jones News/Retrieval & CompuServe. Both text & binary file transfer supported.
$150.
Int'l Computer Consultants, 1311 Clegg St., Petaluma, CA 94952, 707/765-9200

Reflection™ for the Mac
Combine the power of your Macintosh and your HP2922 Terminal. More than an emulator, Reflection provides background processing with Switcher, error-checking file transfer protocol, and our programmable command language for automating repetitive or complex tasks. $199.
Walker Richer & Quinn, 2825 Eastlake Ave. E., Seattle, WA 98102, 206/324-0350, 800/887-2829

TextTerm+Graphics
A new, flexible DEC VT100 text emulator & Telargon (4014, 4015) graphics emulator. Reverse scroll; transfer text, tables, graphics (Paint/PICT); high-quality color printing/plotting; file shipping; editor for correcting electronic mail, direct LaserWriter support. $195.
Mesa Graphics, P.O. Box 600, Los Altos, CA 94049, 505/672-1998

Contact:
Burroughs emulation. Contact software emulates TD/MT/ET terminals. Sophisticated data capture—real screen data can be used by spreadsheet, database, word processor… can be XMODEM file transfer. Fully accessible Mac interface. Soft keys, multiple pages & addresses, password protection… Soon: full file transfer capabilities. Sperry terminal emulation.
Avenue Software, Inc., 1173 W. Chavez Blvd., Quebec, Canada GIF 2CO, 418/682-3088

Data Acquisition

MacPacq
The MacPacq transforms the Macintosh into a digital oscilloscope, chart recorder & waveform generator. A complete data acquisition & control system. 8 channel A/D, 8 digital I/O, programmable gain, 64K RAM. Optically isolated line or nicad powered. Runs remote and/or connected to Mac. Comprehensive software interface provides for powerful & flexible system. $995 complete.
Biopace Systems, 42 Aero Camino #215, Goleta, CA 93117, 805/968-8880

Desktop Engineering

Parameter Manager™
Designed for people who need to manage, analyze & graph time, date, or sample-based data. No macros or templates are needed to produce trend plots, strip charts, histograms, forecasts, parametric plots, statistics, correlation, and financial high-low charts. Plot up to 32,000 data points, 96" x 48" in size. Text input & "Calculated Parameters" $35. Complete Demo $10, MC/Visa.
Structural Measurement Systems, Inc. (SMS), 951 Riser Oaks Parkway, San Jose, CA 95134, 408/263-3200. Orders 800/654-5147, 800/247-4994 (CA)

Desktop Presentations

Carousel™ Color Slides
Carousel lets you easily create 256-color 35mm slides from MacDraw files. You assign colors with MacDraw Patterns. Slide files are transferred by modem to a professional slide-imaging center. 2K slides only $7 each, 4K slides $14. Slides in 48 hrs. Free delivery: Call for free samples.
20/20 Data Systems, 7000 Cameron Rd., Austin, TX 78752, 512/454-2508

Desktop Publishing

Interactive PostScript
Program Printscript™ interactively over AppleTalk using the PostHaste™ integrated programming environment. Full-featured editor, separate error-message capture window, & fast upload/download with no file size limit. Great for the beginner, essential for the serious PostScript programmer! $59.95.
Micro Dynamics, Ltd., Dept. W, 8555 Sixteenth St., #802, Silver Spring, MD 20910, 800/634-7638 or 301/589-0300

MacPalette
by Microspot prints multicolored graphics & text from most Macintosh software using the Imagerwriter IL. MacPalette will colorprint documents from MacDraw, MacDraft, MiniCad, MacProject, MacWrite, JAZZ, Microsoft Chart, Word, Excel etc. (not MacPaint.) It prints black as a true black instead of mixing a black. $69.
CompuServe Co, 800 Freedon, Slidell, LA 70458, 800/272-5533 or 504/649-0484
Desktop Design Tools

- **MicrType™** Newsletter for those who love letters. $30/yr.
- **Free Subscription to buyers of MA Prospera™**, our latest serif text & display alphabet family for LaserWriters $39.95. (Award-winning designer: Ligatures, etc.)
- Free issue with samples. Just ask!
- Also MacStamp™ rubber stamp for your Mac, w/MacWoodtype™ (1800’s letters, borders) for $39.95!

Digital Logic Design

- **Professor McCAE**—logic entry & simulator using industry standard CAE features—gets you started on the right track. Draw logic & simulate until you get it right. It’s fast, easy, and convenient. Uses “real” gate delay to accurately detect spikes & races. $149 + s/h ($39 to professors, limit 1) Fully credited to professional package. 30-day MONEY BACK GUARANTEE ($19 fee)

NEW-Course Builder™

Create stand-alone courseware for teaching, training, or testing with the click of a mouse. Build-ins:
- Draw
- Paint
- Sound
- Video
- Music
- Grades
- Branches
- Text
- Numeric, mouse input. Send for brochure, demo on ComputeServe. $300.

TeleRobotics™ International Inc., 8410 Oak Ridge Hwy., Knoxville, TN 37931, 615/690-5600

MacKids™

**The Learning Edge**

Alphabetizer: Lemonade Stand

Naval Battle: ClockWorks

BodyWorks: WordSearch

CoinWorks: FlashWorks

Preschool 1

Preschool 2

Early Elementary 1

EarthWorks

Each title $39.95. MC/Visa/Check. Write or call for a free catalog.

Nordic Software, Inc., 3939 North 48th St., Lincoln, NE 68504, 800/228-0417, 402/466-6502

MacANATOMY

A complete electronic atlas of human anatomy in MacPaint document form. The drawings may be modified and merged into MacWrite documents using the Clipboard. Composed of four volumes, available singly or as a collection.

MacMedic Publications, Inc., 4805 Westheimer, Houston, TX 77057, 713/977-2055

Kieran

Interactive learning program for preschool children, ages 2-6. Totally mouse-driven, Kieran uses a speech synthesizer to TALK to your child. Kieran can learn names and speak directly to your child. Covers alphabet, time-telling, counting, upper-case letters, and Mystery! $39.95

Qom Software Co., 163 Richard Dr., Tivetown, RI 02878, 401/253-9354

WHO AM I?

A challenging and entertaining educational quiz game about the lives of famous people, past and present, from around the world. Billions of different plays to intrigue you. You may even earn yourself a named certificate: Excellent training for TV shows, contests, etc. All ages. $15.95

Minims Software, 21 Wood St., Eastwood NSW 2122, Australia

O Educational/Games
Scientific Plotting Package

Softwear Plot produces publication-quality plots using multicolum ASCII file (e.g., program outputs, text editors, spreadsheets). Linear or logarithmic plots using multicolored custom labels and colors. Number of arithmetic formats in either axis, over 900. Softwear Products, 7230 Oliver St., Canoga Park, CA 91304, (818) 705-2200+

Microprocessor Development

LaserWriter and compatible, $99.95 + $5 s/h. Microprocessor Development, 1600 Packard Rd., #708, Sherman Oaks, CA 91403, (818) 784-6863

Entrepeneurial

Moonlighting Made Simple

How to Moonlight with Your Computer is the greatest gold mine of easy ways to earn extra money that has ever been crammed into one big book. Send for it FREE! B.R.C. Box 150, CHICAGO today! Another way you can strike pay dirt is with the amazing power of Real Estate Partners. See July 87 Macworld Product Announcement. Demo disk $10.

Financial

Loan Amortization

Amii is a straightforward loan-amortization software package designed by a CPA & tax attorney. Amii supports variable rates, graduated, skipped, and principal only payments. Also includes balloons, negative amortizations, customized schedules, loan analysis, & more. $49.50 + $5 s/h.

Genealogy

MacGene™ (version 2.0)

Ideal for beginners & advanced users. Fastest & most complete genealogy program. Designed specifically for the Mac. Fully integrated data entry, search, select, list, chart printing. Features: descendant, pedigree, group charts, extensive notes, LDS & user defined fields. Compatible with MacWrite, MacScribe, Microsoft File, supports Data Transfer, 60% faster. $145. Call/write for free info:

Family Heritage File

Most powerful genealogy program on the Mac. Licensed version of Personal Ancestral File™ produced by the LDS Church.

Family Roots™

Do it YOUR way! Huge variety and capacity for your family history. Makes pedigree charts and indices. Phased releases will add group sheets, searches and much, much more. Standard Mac screens/mouse, free brochure and sample prints. Satisfaction guaranteed. Currently $72.50, add $22.50 per each new release (total $185). MC/VISA/AME. Quickscrib. Box 216, Lexington, MA 02173, 617/641-2930

Graphics

MAC-ART LIBRARY

Illustrate your ideas w/MAC-ART LIBRARY! 12 disks of professional MacPaint images:

- Flowers/Trees/Plants
- Greeting Cards
- People
- Transportation
- Signs/Symbols/Borders

MiniCAD 3.0

by Dichi Graphsoft boasts 1000+ power zoom, symbol library, 40 layers, auto dimensioning, double line tool, paint/intersect tools, object snap, fitler & trim-line tools, object size & location, 9 decimals accuracy, full 2-D & 3-D modes, etc. It reads MacDraw & MacDraft files. $49. Demo avail. CompServ. 800 Freedom, Slidell, LA 70458, 800/272-5533 or 504/649-0484

Perspective Drawing

GridMaker™: perspective grid construction set. Create a variety of 3-dimensional grids that can be used within MacDraw or MacDraft as a guide for perspective drawing. Grid shape, dimensions, line density, rotation, and perspective are independently controlled. Suitable size: $49.50.

Interesting Graphics

Our skilled illustrator has produced 5 collections for your Mac. Illustrations are: Horror/Fantasy; #1, Bytes of Fright, Dinosaur Bytes (natural history), Sky Bytes (aerospace), and Classic Sci Fi. The collections contain a variety of images, each of which is carefully crafted. Each collection is $29.95 ($32.05 in CA).

Macworld
Macworld Directory

Alternative Graphics
Bored w/clip art? We offer 2 exciting new graphics collections:
• DRAWINGS BY LEONARDO—Leonardo da Vinci’s finest drawings of anatomy, engineering, nature & science—faithfully reproduced as MacPaint images. • COMICARDS—Create personalized cards, messages, invitations, or “art for art’s sake” w/creative & humorous vol. of cartoons &illus. $29.95 ea. + $3 s/h. Chk/MO only. (CA res. add 6%) ScanMaster™ 2700 West Coast Hwy. #220 Newport Beach, CA 92663, 714-548-5967

MacPlot & MacCAD
MacPlot by Microspot is a powerful plotter driver that will plot any object-oriented graphics produced on the Mac in up to 30 colors/pens. MacPlot supports over 50 plots, MacCAD is a series of 12 separate architectural &engineering template symbol libraries for use with MacDraw, MacDraft, MiniCad, etc. CompServCo, 800 Freedom, Slidell, LA 70458, 800-272-5533 or 504/649-0484

GraphPack Plot Library
Appends to a Microsoft FORTRAN program to generate charts/graphics. Includes industry standard calls (plot, line, axis, etc.) and 3D hidden-line routines. Direct interface to clipboard and printers (e.g. LaserWriter) for high-quality output. Graphs can be edited in MacDraw. Source code included. $69.95.
Lipa Software, 16 S Harcross Rd., Woodside, CA 94062, 415/366-0547

GraphicPainter™
Already proven in industry and university use! Does scatter, line, area, bar, column, overlays, log, semilog, multi-axis, multises &more. You control scaling, grids, markers, patterns, etc. Finish with the paint tools & 7 curve fits. Full I/O of data &graphics, undo & manual, 512K+ req. $50.
Greg Brasel, P.O. Box 4274, Chesterfield, MO 63006, 314/256-3317

• Health
Healthcare Management
HealthCare Communications, 245 South 8th St., #301, Lincoln, NE 68510, Toll-free: 800/422-6227

Nutritional Software
Take steps to eat more sensibly: Analyze diets for nutritional content (calories, sodium, etc.) NutriCalc™ includes 32 nutrients, 1700+ foods (3000 avail.). Offers FDA Comparison, tracks histories, energy analysis. $225. NutriCalc™ analyzes 8 nutrients, 900+ foods. Plots progress, analyzes recipes. $95. Both have brand name & fast foods, NCP CAMDE Corp., 4435 S. Rural Rd., #331, Tempe, AZ 85282, 602/821-2310

FamilyCare Software™
Illness? Injury? Learn what to do when your child is hurting. FamilyCare will help you diagnose the problem and tell you how to get proper medical help—anytime day or night. Developed by expert pediatricians, FamilyCare is comprehensive, reliable, and easy-to-use. Ages newborn—5 yrs. $180, guaranteed.
Lundin Laboratories, 28451 Greenfield Rd., #216, Southfield, MI 48076, 800/426-8426

• Investment
Profits
Powerful, very fast, very flexible, new program allows you to pick winning trades, avoid the losing trades. Charting tools include stochastic, MACD, moving averages, RSI, and much more. For the stock, commodities, or options investor or broker.
Buttomedown Software, P.O. Box 19-63, San Diego, CA 92119, 619/463-7474

• Imports
Japanese Software
E/G Word (Ergosoft Inc.) is a Japanese word processor, can turn romaji sentences into kana & kanji.

• Market Research
MacCAT™ Computer Assisted Telephone Interviewing pkg. Survey/marketing, political polling/marketing.
• Auto dialing
• Handles skip patterns
• Call records/apps.
• Statistics
• Networks interviews
• 500 questions/2 yrs. in devlpmt. $795 for 2 station pkg. $200 ea. additional pkg.
SPRC Software, Bowling Green State University, Bowling Green, OH 43403, 419/372-2947

• Mathematics
PowerMath
Solves problems from simple algebra to complicated calculus expressions. You can differentiate, integrate, plot polynomial expressions, manipulate matrices, solve simultaneous equations, and create custom functions. If you are a student, engineer, or work with math, you’ll love the easy-to-use versatility. Retail $100.
Central Products Corp., 2211 Norfolk #518, Houston, TX 77009, 713/529-1080

• Medical
Medical & Dental Mgmt.
Solo or multipartner office includes patient (responsible party) billing, recall, paper/electronic claims, aging, collections, SuperBill, labels, diagnostic history, Word/MacWrite, audit & productivity reports. 24-hr. support. 512K+ hard disk or XL, Mac& II, Mac Office. Demon from $100. AMEX/Visa/MC, 2-400+ dealers.
CMA Micro Computer, 55888 Yucca Trail, P.O. Box 2080, Yucca Valley, CA 92286-2080, 619/365-9718

• Networking
DECGnet™ for the MAC
TSSnet™ allows your MAC to become a true networking partner in a DECG network. Supports low-cost asynchronous connection and supports task-to-task communications, file transfers that retain all Mac characteristics, and VAX electronic mail. $399 includes 30-day money-back guarantee and 6 months support.
Thursby Software Systems, 5840 Interstate 20 West #145, Arlington, TX 76017, 817/747-5070

$399. Req. 512K. Also:
Mac Calligraphy simulates medium of ink & brush on paper $149.95 (Enzan Hoshigumi Co.) Qualitas Trading Co., 6907 Norfolk Rd., Berkeley, CA 94705, 415/848-8080

• Languages
FORTRAN + Mac Interface
MacFace Tools 3.0 provides Fortran programs with Mac interface by modifying only three lines of code. Includes full DA, file, & edit menus and multiple windows. Source code included. MacFace, sub 3.0, allows further flexibility, picture editing, alerts, dialogs, & more without a toolbox call. Tools $19, sub $40. Both $149.
Torsor Laboratories, P.O. Box 9723, Stanford, CA 94305, 707/763-7873

LISP Development System
Macscheme+ Toolsmith™ has what you want for interactive development:
• Native code compiler
• Stand-alone applications
• Easy-to-use window & menu objects
• Multitasking & interrupts
• A standard LISP dialect: Scheme™ still only 125. (Req. 512K)
Semantic Microsystems, Inc., 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

• Management
GYST
The only information management program for salespeople and other professionals
• Client organization systems
• Record each contact with a client
• Integrated appointment calendar
• Powerful report generator
• Mail merge
The productivity of your entire office will improve. $99.95.
Contact Systems, Inc. 509 River View Dr., Marietta, GA 30067, 404/953-8242, 800/322-4589

256 September 1987
Payroll Made Easy!
The AATrix Payroll™ program for the Macintosh generates federal and state tax reports and bookkeeping records. The program also calculates FICA, insurance deductions, federal and state withholdings tax. Prints out paychecks on your custom designed forms. Introductory price: $59. AATrix Software, P.O. Box 217-A, Grand Forks, ND 58206, 701/746-7202

Plotter Drivers
Plot-It
Plots MacDraw, MacDraft, MacProject, MacPaint, etc. on popular Apple, HP, or Houston Instruments pen plotters in sizes A,B,C,D, and E. Use for accurate engineering and architectural drawings or color data plots. Flexible color interface and scaling. $125. See review in October '86 Macworld.
Mesa Graphics, P.O. Box 600, Los Alamos, NM 87544, 505/672-1998

Printer Drivers
Printer Choice for Mac
MAC DASY LINK™, a new member of the GDT printer driver family, is a single driver that allows any daisy wheel printer or properly interfaced typewriter to be used w/in any Mac. User configurable ($82). THE PRINT-LINK™ continues as the printer-specific family member that supports a variety of dot matrix printers (9 & 24 pin) & ink jet printers. Printers too numerous to list ($62). Both install using Chooser. Mac to printer cable $22.95, LP adapter cable $15.
GDT Software, P.O. Box 1865, Point Roberts, WA 98281-1865

Payroll
Time Saver Payroll™ V.3.0 COMPLETE FULL-FEATURED Payroll System
- Calculates • Accumulates
- Prints reports • Salaries, hourly, & comm. wages • 10 deductions, incl. fed & state taxes • Tax tables easily edited by user • Monthly & quarterly reports, incl. 941, FUTA, SUTA • Prints checks and W-2 forms • Flexible easy to use! Req. Microsoft Excel $75 + $3 sh. MC/Visa/Chk. Demo $10 + $3 sh.
Western Software Associates, 110 El Dorado Rd., Walnut Creek, CA 94595, 415/932-3999

Project Management
AEC Information Manager™
Powerful, easy-to-use project-oriented database designed specifically for the design and construction industries. Allows project managers to schedule, organize and track • Correspondence • Transmittals • RFIs • Revisions • Change Orders • Submittals • Shop Drawings • Punch Lists • Projects. First of its kind! AEC Management Systems, Inc., 20524 Amethyst Ln., Germantown, MD 20874, 301/428-3694

Programming Tools
Programmer's Extender™
Compiled libraries speed up Macintosh application development. Vol I: windows, menus, text edit, scroll bars, dialogs. Vol 2: list mgr, support, text & graphics printing & I/O, marquees, lasso, zooming, & tiling windows. Avail. for LightspeedC, TML Pascal, & Lightspeed Pascal. $89.95/ volume.
Invention Software Corp, P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

Public Domain
Mac Software from $3.00
The best, most complete public domain & shareware collection available, with over 360 disks. Everything from business programs to games and desktop publishing. We offer the best after-the-sale service, with toll-free order lines, overnight & second-day delivery, technical support hotline. Call or write for free 128 pg. catalog.
Educomp, 742 Gonwieve, Suite D, Solana Beach, CA 92075, 800/843-9497, 800/654-5818 (in CA), 619/259-0255 (for info.)

200+ Mac Disks
Don't get ripped off! 400K or 800K disks for a $3 copying charge per disk! One-day turnaround. Free shipping and every 6th disk free. Send $1.75 for a catalog with full program descriptions.
CHA Services Inc., Dept. 3, P.O. Box 622, Lincoln, MA 01773, 617/891-1991

PD Software Club
We have the best in proven updated PD software. We scour all the national and local sources for you. Your 50 disks contain only current versions of over 1000 items. $2 gets you our catalog & a $2 coupon. $20 annual membership fee gets you monthly newsletters and 2 FREE disks of fonts and DA's. Monthly disks $6.95, library disks $8.95. Visa/MC/Transitam International, 1730 E. Olsorf St., #127, Austin, TX 78741, 512/442-0266

The Mac Group
Become a LIFETIME member for only $15 and receive our PD Catalog, sampler disk, and 15% discount on TMG disks. We also offer customized public domain disks (you choose from 1000's of titles), bargain CLIP ART, and the BEST THEME DISKS. Send $1 for our TMG Catalog, Visa/MC.
The Mac Group, P.O. Box 85152 MB 231, San Diego, CA 92138, 619/747-7940

2300+ Prgms•Tips•Nwsltr
No club has more programs or a better newsletter. Members in 31 countries. 1-time $20 subscription gets you our intro disk with 10 terrific pgrms plus a 3-disk description of our HUGE library of over 2300 pgrms PLUS our quarterly newsletter filled with tips and new programs. Members pay $9 for any disk (plus $1 s/h).
PD Mac, Dept. 19, P.O. Box 5626, Sherman Oaks, CA 91423

Affordable Mac Software
Outstanding collection of public domain software covering all topics for only $5 per disk. No minimum req. Disks are packed to the brim with the latest software releases. Double sided 800K disks are also available. For free membership, bulletins & a beautifully illustrated catalog, send $1 to: MCUS, P.O. Box 6963, Dept. 55, San Jose, CA 95150, 408/725-3388

More Bytes for your Buck!
Choose from our huge library of 1800+ programs, games, DA's, fonts, & artwork at only $3.50 per disk or 3/$10! No membership fees, no minimums, no gimmicks. Just great software at honest prices. Disks are packed full with the latest releases. Send $2.50 for disk catalog & 5 free programs! MGVisa. See display ad this issue!
Budgetbytes™, P.O. Box 2248, Topleka, KS 66601, 913/271-6022

Real Estate
Property Management
Comprehensive program for managing residential and commercial properties. Many management reports, including operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses — $59. Investment analysis — $245. Jardli Systems, 930 Laguma St., Santa Barbara, CA 93101, 805/687-4245

Investment Analysis v. 5.1
From RealData, the leader in real estate software. Latest tax reform rules incl. in powerful sensitivity analysis for income property. Detailed 10-y. report of income, expenses, financing, depreciation, cash flows, tax consequences (incl. passive losses), future value & resale, IRR/PMR/cash-on-cash/cap. Rate, lease analysis & more. Flexible, easy to use. Req. Excel™, Works™ or Jazz™. $195. MC/Visa/Ammex/COD
RealData, Inc., 78 North Main St., South Norwalk, CT 06854, 503/255-2732

The Appraisal Office
RealData, Inc., 78 North Main St., South Norwalk, CT 06854, 503/255-2732

Macworld 257
Income Property Analysis
REM's Investor, 2000, the only CCIM Recommended Software for the Mac, performs multi-year cash flow projections, IRR, FMRR. Partial year, powerful financing. Fully updated for the new tax law. Excellent tool for realtors, bankers, CPAs, investors. Uses all Mac interfaces, no templates. Demo disk available, 30-day money-back guarantee! $995.
REM Software, 3860 159th Ave. NE, Suite 110, Dept. 1, Redmond, WA 98052, 206/883-7000

Property Management
Complete manager's tool for residential & commercial properties. Features include full accounting & budgeting, operating statements, & easy starting balances; Rental, Repair, & Tenant Managers; auto. rent increase & late fees; over-40 reports per IREM specs; Personal Investor $995, Professional $1,295.
MacLord Systems, Inc., 9487 Magnolia Ave., Riverside, CA 92503, 714/687-1919

TRACK™
Multi-user database for tracking clients & prospects; contact history, mail labels & more. Also includes electronic index cards; appointment calendar, auto-dialer, mortgage calculator, expense log, tickler & terminal function. 1 of 8 new products in 1987. $995.
Software, Inc., P.O. Box 2285, Huntington, CT 06484, 203/936-1116

FOR SALE™
Multi-user farming system for increased sales & listings. Maintain database on all property types including property description and owner. Search by any field; mail labels; contact history; & more. Includes appointment calendar, auto-dialer, & tickler functions. Great for market evaluations! $695.
Software, Inc., P.O. Box 2285, Huntington, CT 06484, 203/936-1116

LIST™
Multi-user property listing system maintains listing info for lease & sale properties including pictures, keeps comparables for CMAs. Search any field; Reports & graphs. User-customizable. Like having your own multiple listing system. 1 of 8 new products in 1987. $795.
Software, Inc., P.O. Box 2285, Huntington, CT 06484, 203/936-1116

LEAD™
Multi-user management system for the solicitation of owners selling their own properties. Classify leads. Sales forecasts and YTD reports & graphs. Also includes electronic index cards, auto-dialer, & tickler functions. $995.
Software, Inc., P.O. Box 2285, Huntington, CT 06484, 203/936-1116

Rental
The MacLibrary, Inc.
Try before you buy... low 16-day rental rates that apply towards purchase—no obligation to buy. We offer a huge selection of Mac software. All the popular programs plus plenty of hard-to-find titles. No fees. Free membership. Special discounts for rapid returns and FREE gifts for frequent users. Plus FREE assistance HOT LINE. Whatever you're looking for, if it was made for the Mac, we probably have it... at LOW RATES. The MacLibrary, Inc., 17200 Newtown St., #3, Fountain Valley, CA 92708, 714/957-5670, 800/426-2777 (CA), 800/662-4774 (Nat'l)

Restaurant
Restaurant Management
Total control for any size restaurant. System includes: inventory control, menu management, help screens, documentation, hotline support, $995. Accounts payable, accounts receivable, restaurant payroll, and general ledger. $125. Visa/MC Demo $25, Req. #18 & Omni's Dealers invited. Money-back guarantee. Keller-Systems Inc., 105 Narcissus St. #310, West Palm Beach, FL 33401, 305/343-3358, 800/458-8430

Sales/Marketing
Market Master for the Mac™
Automatic Sales Inquiry Follow-up. Enter leads whenever you get them and MarketMaster™ contacts the right people the right way at the right time. Prints letters & envelopes, phone lists, scripts, and NEVER FORGETS! Easy to learn and use. Frees salespeople to SELL and helps them to SELL MORE!
Breakthrough Productions, 10659 Caminito, Casa de la Murray, CA 92108, 619/281-6174

Scientific
Tools for Scientists
Two low-priced products that enhance the usefulness of your Mac. Our Scientific Symbols Fonts disks contain all the characters in IBM's Selectric symbols ball and more for $10. The Spectral Analysis Package provides four basic functions: forward and inverse transform, power spectrum and autocorrelation for $75.
Probability Distribution, P.O. Box 27276, Austin, TX 78755-2726, 512/338-1250

Security
Advanced Copy Protection
The leading software manufacturers depend on Softguard copy protection. Introducing our Protection Kit, a complete copy protection system that runs on the Macintosh.
- Stops all copybusters
- FULL HARD DISK support
- No source code changes
- Compatible with all Macintosh systems.
Free demo disk. Softguard Systems, Inc., 2840 San Tomas Expwy. #201, Santa Clara, CA 95051, 408/970-9240

Statistics
CLR ANOVA
Analysis of variance program that can compute up to a 10-way design with repeated measures and unequal n. Marginal means, plots of interactions, simple effects, range tests, contrasts, and more. Full Mac interface. Two data editors provided. Can read text files/entries separated by spaces, commas, or tabs. $75 + $3/s/h.
Cleard Lake Research, PO. Box 127, Houston, TX 77005, 713/652-2246 ext. 193, or 800/362-2421 ext. 199, in Kansas

STOCK MARKET
Portfolio/Market Link
- Stock Portfolio System, a complete portfolio manager, incl. 9 reports, tie to Dow Jones or manual update. Handles diversified investments.
- Market Link, auto fetch up to 120 quotes up to 8 times in untended mode. Tie to DJ or Source. Bridge quotes to Excel.
Free brochure + 100% rebate offer. SmithMicro Software, Inc., P.O. Box 7137, Huntington Beach, CA 92645, 714/964-0412

Tax
Ready for Tax Reform?
If you had TAxMASTER you would be. Excel, Multiflow, Works templates to plan your 1987 tax situation. Also includes W4 & WSA forms. TAxMASTER calculates IRAs, capital gains, itemized deductions, passive incomes and losses, home refinancing and more! IBM & Apple II versions avail. $50. Order line: 800/826-7166. Visa/MC.
Island Computer Services, 3501 East Yacht Dr., Long Beach, CA 90801, 516/278-9483

Utilities
Stepping Out:
The Macintosh Screen Extender fools the Mac into thinking it has a bigger screen. User chooses screen size appropriate for the task at hand. View of the pages slides over when the cursor hits the edge of the physical screen. The user can work with the entire screen at once via 2- & 4-times reduction commands. 2- to 16-times enlargements are avail. for detail work. $95.
berkeley System Design, 1706 Shattuck Ave., Berkeley, CA 94709, 415/540-5536

Word Processing
Mac/Qn/Equation Writer
MacQn is a desk accessory equation processor that lets you include complicated mathematical equations in your technical documents. MacQn supports integrals, sums, products, multiline expressions, roots, super- & subscripts on the same character. Automatic character sizing, etc. $44.95 Educational discount avail.
Software for Recognition Technologies, 55 Academy Dr., Rochester, NY 14623, 716/359-3024

Macworld Directory
FAST, RELIABLE SCSI
MASS STORAGE SYSTEMS
Macintosh Plus / Macintosh SE
Macintosh II

Selectable Interleave, AppleShare and A/UX Compatible
SCSI Tape Backup System Available

MacStack 20, 40, 43 or 80 MB
Compact Model 20 MB or 40 MB
Power Tower 320 MB or 640 MB

HIGH PERFORMANCE SCSI HARD DRIVE AND TAPE BACKUP SYSTEMS
EXTERNAL: Macintosh Plus / SE / II - 20 MB to 960 MB Hard Drives - Complete Including Cables
INTERNAL: Macintosh SE - 40 MB - 29 ms Average Access - Replaces Upper Floppy or Hard Drive
INTERNAL: Macintosh II - 40 MB, 43 MB or 80 MB - Under 30 ms Average Access - Easy Installation
MacStack: Macintosh Plus / SE / II - 20 MB, 40 MB, 43 MB or 80 MB - SCSI Hard Drive Subsystems
TapeStack: Macintosh Plus / SE / II - 40 MB SCSI Tape Backup System with Data Compression
PowerTower: Macintosh Plus / SE / II - 320 or 640 MB - up to 16 MB of Cache - .5 ms Average Access

Best Performance • Best Price • Mass Storage Specialist

Call for the name of your nearest authorized dealer

CMS Enhancements, Inc. • 1372 Valencia Avenue • Tustin, California 92680
Phone: (714) 259-9555

Macintosh Plus, SE, II, AppleShare and A/UX are registered trademarks of Apple Computer, Inc.; Power Tower and MacStack are trademarks of CMS Enhancements, Inc.

Circle 657 on reader service card
It's easy to get more information on products advertised in Macworld.

Here's how:
- Print or type your name and address and circle the appropriate answer to each question.
- Circle the numbers that correspond to the reader service numbers for the products that interest you. These numbers appear in the ads and in the Advertiser Index.

1. Your primary job function:
   a. Corporate or general manager
   b. Department manager
   c. MIS or micro manager
   d. Engineering or scientific
   e. Professional
   f. Reseller/VAR
   g. Self-employed
   h. Other

2. Number of employees in your company:
   1. 25 or fewer
   2. 26-99
   3. 100 or more

3. Plan to buy:
   a. Now
   b. In 4-6 months
   c. In 7-12 months
   d. More than 12
   e. For reference only

4. For how many personal computers do you buy products? (Include both company and personal units, please.)
   a. 1
   b. 2-4
   c. 5-9
   d. 10 or more

5. How many of the above are Macintoshes?
   a. 1
   b. 2-4
   c. 5-9
   d. 10 or more

For reference only.

Please circle the number(s) that best apply and send this card(s) to Macworld.

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

Get more information on products you're interested in—simply return one of these cards today. There's no cost. And no obligation.

Valid Through 12/15/87

Valid Through 12/15/87

September 1987

S1
## Product Index

<table>
<thead>
<tr>
<th>Service Number</th>
<th>Reader Service Number</th>
<th>Reader Service Number</th>
<th>Reader Service Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>622</td>
<td>334</td>
<td>755</td>
<td>712</td>
</tr>
<tr>
<td>3M</td>
<td>697</td>
<td>500</td>
<td>375</td>
</tr>
<tr>
<td>750</td>
<td>35</td>
<td>267</td>
<td>537</td>
</tr>
<tr>
<td>790</td>
<td>194</td>
<td>537</td>
<td>374</td>
</tr>
<tr>
<td>675</td>
<td>59</td>
<td>537</td>
<td>233</td>
</tr>
<tr>
<td>785</td>
<td>194</td>
<td>537</td>
<td>59</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Business</th>
<th>Abaton Technology Corp., 54</th>
<th>Apple Computer Inc., 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circo Business Solutions, 62-63</td>
<td>Dynamic Press, 268</td>
<td>E-Machines, Inc., 60</td>
</tr>
<tr>
<td>Computer Shoppe, 84</td>
<td>Electronics, Inc., 194</td>
<td>Edman Engineering, Inc., 94</td>
</tr>
<tr>
<td>Cricket Software, 211</td>
<td>Ericsson, Inc., 209</td>
<td>Fashionware, Inc., 219</td>
</tr>
<tr>
<td>Infosphere, 40</td>
<td>Firefox, Inc., 210</td>
<td>Fitec, Inc., 210</td>
</tr>
<tr>
<td>Letraset, 204-205</td>
<td>Graphisoft, Inc., 210</td>
<td>Focus Point Systems, Inc., 210</td>
</tr>
<tr>
<td>Living Videotext, Inc., 10, 82</td>
<td>Graphics Desktop Publishing</td>
<td>Foundry, Inc., 210</td>
</tr>
<tr>
<td>Odesa Corp., 226</td>
<td>Apple Computer, Inc., 9</td>
<td>Garbee, Inc., 210</td>
</tr>
<tr>
<td>Omnigraffle, Inc., 96</td>
<td>Apple Computer, Inc., 9</td>
<td>Gear, Inc., 210</td>
</tr>
<tr>
<td>PMC Telemetry, 216</td>
<td>Apple Computer, Inc., 9</td>
<td>Genisys, Inc., 210</td>
</tr>
<tr>
<td>Personal Training Systems, 267</td>
<td>Apple Computer, Inc., 9</td>
<td>General Mills, Inc., 210</td>
</tr>
<tr>
<td>Qualitas Trading Co., 265</td>
<td>Apple Computer, Inc., 9</td>
<td>Genisys, Inc., 210</td>
</tr>
<tr>
<td>SBT Corp., 233</td>
<td>Apple Computer, Inc., 9</td>
<td>Geotechnica, Inc., 210</td>
</tr>
<tr>
<td>Sator Software, 87</td>
<td>Apple Computer, Inc., 9</td>
<td>General Motors, Inc., 210</td>
</tr>
<tr>
<td>Spectrum Digital Systems, 72-73</td>
<td>Apple Computer, Inc., 9</td>
<td>Gedex, Inc., 210</td>
</tr>
<tr>
<td>StattSoft, 265</td>
<td>Apple Computer, Inc., 9</td>
<td>Getronics, Inc., 210</td>
</tr>
<tr>
<td>Survivor Software LTD., 245</td>
<td>Apple Computer, Inc., 9</td>
<td>Getronics, Inc., 210</td>
</tr>
<tr>
<td>Sytax, Inc., 197</td>
<td>Apple Computer, Inc., 9</td>
<td>Giganews, Inc., 210</td>
</tr>
<tr>
<td>Sytax, Inc., 197</td>
<td>Apple Computer, Inc., 9</td>
<td>Gramm, Inc., 210</td>
</tr>
<tr>
<td>Vertical</td>
<td>Apple Computer, Inc., 9</td>
<td>Grinnell, Inc., 210</td>
</tr>
<tr>
<td>AppleSoft, Inc., 78</td>
<td>Apple Computer, Inc., 9</td>
<td>Group, Inc., 210</td>
</tr>
<tr>
<td>Data Management</td>
<td>Apple Computer, Inc., 9</td>
<td>Guide, Inc., 210</td>
</tr>
<tr>
<td>Odesa Corp., 226</td>
<td>Apple Computer, Inc., 9</td>
<td>Guidance, Inc., 210</td>
</tr>
<tr>
<td>ProVAE Development Corp., 176</td>
<td>Apple Computer, Inc., 9</td>
<td>Guinevere, Inc., 210</td>
</tr>
<tr>
<td>Word Processing</td>
<td>Apple Computer, Inc., 9</td>
<td>Gumi, Inc., 210</td>
</tr>
<tr>
<td>Ann Arbor Software, 14-15</td>
<td>Apple Computer, Inc., 9</td>
<td>Gutierrez, Inc., 210</td>
</tr>
<tr>
<td>Lundecon &amp; Associates, 266</td>
<td>Apple Computer, Inc., 9</td>
<td>Gwydion, Inc., 210</td>
</tr>
<tr>
<td>Microsoft Corp., 24</td>
<td>Apple Computer, Inc., 9</td>
<td>Halex, Inc., 210</td>
</tr>
<tr>
<td>Postcraft Int'l., Inc., 55</td>
<td>Apple Computer, Inc., 9</td>
<td>Hard Disk Storage, Inc., 210</td>
</tr>
<tr>
<td>T-Maker Co., 1BC</td>
<td>Apple Computer, Inc., 9</td>
<td>Halliburton, Inc., 210</td>
</tr>
<tr>
<td>Communications</td>
<td>Apple Computer, Inc., 9</td>
<td>Hamilton, Inc., 210</td>
</tr>
<tr>
<td>Abaton Technology Corp., 54</td>
<td>Apple Computer, Inc., 9</td>
<td>Hammer, Inc., 210</td>
</tr>
<tr>
<td>Centron, 66-67</td>
<td>Apple Computer, Inc., 9</td>
<td>Hanover, Inc., 210</td>
</tr>
<tr>
<td>DataViz, Inc., 275</td>
<td>Apple Computer, Inc., 9</td>
<td>Harpoon, Inc., 210</td>
</tr>
<tr>
<td>Infosphere, 40</td>
<td>Apple Computer, Inc., 9</td>
<td>Harrison, Inc., 210</td>
</tr>
<tr>
<td>Omnigraffle, Inc., 96</td>
<td>Apple Computer, Inc., 9</td>
<td>Harrison, Inc., 210</td>
</tr>
<tr>
<td>Pallant, 272</td>
<td>Apple Computer, Inc., 9</td>
<td>Harrison, Inc., 210</td>
</tr>
<tr>
<td>Peripheral Computers &amp; Supplies, 264</td>
<td>Apple Computer, Inc., 9</td>
<td>Heath, Inc., 210</td>
</tr>
<tr>
<td>334</td>
<td>Apple Computer, Inc., 9</td>
<td>Hewlett-Packard, Inc., 210</td>
</tr>
<tr>
<td>697</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
<tr>
<td>768</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
<tr>
<td>538</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
<tr>
<td>35</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
<tr>
<td>194</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
<tr>
<td>59</td>
<td>Apple Computer, Inc., 9</td>
<td>High Sierra, Inc., 210</td>
</tr>
</tbody>
</table>

### Hardware


### Mail Order

| Best Computer Supplies, 100 | Icon Review, 48-51 | MacConnection, 104-107 |
| Dacor, Inc., 57 | MacStore, 270 | Programs Plus, 68-71 |
| Anixor Corp., 20 | Software Library, 52 | Rainbow Computer Supplies, 231 |
|倨 | USA Flex, 240 | Rome, Inc., 231 |
| 375 | Vision Technologies, 249 | Symbian, Inc., 231 |
The best color graphics system for the Macintosh II.

See the difference...know the reasons

You are about to enter a new dimension in personal computing with the PCPC II™, a high resolution color graphics system for the Macintosh II. The PCPC II 19 inch monitor gives you a giant window into the color world of computer aided design, computer modeling, advertising, presentation graphics, desktop publishing and unlimited color applications. Designed for the most demanding professionals, the PCPC II provides the power and performance required to be your creative best.

Look at a PCPC II and experience the sharpest and most vivid colors possible. Witness a dazzling display of 256 colors from a palette of 16.8 million hues for the most realistic images possible. And for monochrome graphics, 256 shades of gray provide maximum detailing.

At PCPC, quality is an essential part of the design. Quality starts with state-of-the-art monolithic CMOS technology, Zip-pack video RAM for high reliability, and the lowest possible parts count to assure long life and trouble-free use. With 768K of video RAM, the PCPC II provides a resolution of 1024 x 768 with 8 bits per pixel. The non-interlaced display ensures an absolutely flicker-free screen and the sharpest picture imaginable. The high resolution monitor (previously found only on engineering workstations costing many thousands of dollars more) displays your work in its best light. The monitor's super fine pitch (0.31 mm) means you get incredible clarity. And for your personal comfort, the PCPC II features an anti-glare coating and a tilt-swivel base.

Now that you know the true colors of quality, don't compromise!

Personal Computer Peripherals Corp.
6204 Benjamin Road, Tampa, Florida 33634
(813) 884-3092 (800) 622-2888

©1987 PCPC. PCPC II is a trademark of PCPC. Macintosh is a trademark licensed to Apple Computer, Inc. PC design created at PCPC with MGD from Vanty, Inc. "Floor Plan." and "Crab" were created with Design and Solid Dimensions from Visual Information, Inc. "Tarboo" and "Rubis" were created by Apple Computer, Inc. "Simple East U.S. Map" was created by Mapmaker from Select Micro Systems, Inc. "Endlessatte" was created with MORE from Living Systems, Inc.

Circle 223 on reader service card
Where to Buy

This section contains information about products featured editorially in this issue. Programs are not copy protected unless otherwise indicated. All prices are list prices. An asterisk indicates that a product review appears in this issue.

Public domain software and shareware are available through online information services, through user groups such as Berkeley Macintosh Users Group (415/849-2684) or The Boston Computer Society's Mac special-interest group (617/367-8080), or through mail-order clearinghouses such as Educomp, 742 Geneviewie, Ste. D, Solana Beach, CA 92075, 619/259-0255, 800/843-9497, 800/654-5181 in California, or The Public Domain Exchange, 2074-C Walsh Ave., Dept. 609, Santa Clara, CA 95050, 408/496-0642, 800/331-8125.

Pages 108 to 113
The QuickDraw Solution

C-Server

General Computer Personal LaserPrinter
General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500. 512K minimum memory; requires RAM cartridge for 512K Mac; hard disk recommended. $2599.

LaserWriter

Linotronic 300
Allied Linotype Co., 425 Oser Ave., Hauppauge, NY 11788, 516/434-0095. 128K minimum memory; requires AppleTalk. $599.95.

MultiTalk
Atabon Technology Corp., 7901 Stoneridge Dr. #500, Pleasanton, CA 94566, 415/663-8822. 512K minimum memory; requires AppleTalk. $695.

Pages 124 to 131
The Desktop Publishing Shopper

Cricket Draw

GraphicWorks

JustText
Version 1.0, Knowledge Engineering, GPO Box 2139, New York, NY 10116, 212/473-0095. 512K minimum memory; external drive and LaserWriter recommended. $195.

MacDraw
Version 1.0, Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. $195.

MacTeX

Microsoft Word
Version 3.01, Microsoft Corp., 1601 N.E. 36th Way, Box 97017, Redmond, WA 98074-9717, 206/882-8080, 800/426-9400. 512K minimum memory; requires 800K of drive storage; Mac Plus with external drive recommended. $395.

PageOne
Version 1.0, Microtech Graphics, Inc., 500 Cochrane Dr., Unit A, Markham, Ontario, Canada L3R 8E2, 416/479-9292. 1MB minimum memory; requires hard disk. $2000, for MacTeX owners $1500.

Raytime

ReadySetGo
Version 4.0 (referred to in article as version 3.1), Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9073. 512K minimum memory; external drive required for 512K; Mac Plus recommended. $495.

Scoop
Version 1.0, Target Software, Inc., 1206 S.W. 130th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512K minimum memory; $495.

Textures
Version 1.0, Addison-Wesley Publishing Co., One Jacob Way, Reading, MA 01867, 617/944-6795. 512K minimum memory; requires external drive; hard disk recommended. $495.

Trapeze
Version 2.0, Data Tailor, Inc., 1300 S. University Dr. #409, Fort Worth, TX 76107, 817/332-8944, 800/443-1022. 512K minimum memory; external drive recommended. $295.

XPress
Version 1.03, Quark, Inc., 2525 W. Evans #220, Denver, CO 80219, 303/934-2211. Permits three copies; 512K minimum memory; requires external drive or hard disk. $695.

(continues)
VersaTerm-Pro™

Version 2.00 Price: $ 295.00

The most complete Tektronix 4105 Graphics Terminal Emulation available on the Macintosh!

Enhanced Tektronix 4014 Graphics Emulation
Zoom and Pan Graphics Interactively from Memory!

- New! Cleared Graphic Screens (up to 32) may be instantly viewed from memory.
- Create MacDraw, MacPaint and MacWrite documents from memory.
- Very high quality graphics may be printed on the LaserWriter.
- Color graphics output supported with ImageWriter II.

Designed for the Professional who requires sophisticated GRAPHICS features as well as the powerful TEXT features of standard VersaTerm.

VersaTerm™

Version 3.00 Price: $ 99.00

Terminal Emulation:

- DEC VT100
- DEC VT52
- Tektronix 4014
- Tektronix 4010
- Tektronix 4014
- DEC VT100
- DEC VT52
- Tektronix XMode
- Text XMode Protocol
- DEC VT100 132 column mode
- High Character throughput

File Transfer:

- TEXT
- HyperTerminal
- XModem
- Kermit
- Multiple file uploads and downloads
- Multiple File Transfer
- Multiple Command Set
- "Word Mouse" feature
- Not Copy-Protected

Designed for professional use requiring sophisticated TEXT features.

Where to Buy

Pages 132 to 139
Beefing Up the SE

Consulair Mac C/Mac C Toolkit

HyperCharger 020
General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500. 1MB minimum memory; requires Mac SE. $1,499, with optional 68881 floating-point coprocessor $1699.

MacFortran/020
Version 2.3. Absoft Corp., 2781 Bond St., Auburn Hills, MI 48007, 313/853-0050. 512K minimum memory; hard disk recommended. $495.

MacWrite
Version 4.5. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. $125.

MegaScreen SE
MicroGraphic Images, 20954 Osborne St., Canoga Park, CA 91304, 818/407-0571. 1MB minimum memory; requires Mac SE. $1995.

Orion SE
Peak Systems, 1201 Spyglass, Austin, TX 78746, 512/328-0747. 1MB minimum memory; requires Mac SE. $1995, optional 68881 floating-point math coprocessor $295.

Prodigy SE
Levco, 6160 Lusk Blvd. #C-203, San Diego, CA 92121, 619/457-2011. 1MB minimum memory; requires Mac SE. 1MB version $1495, 2MB version $1995, 4MB version $2795, optional 68881 floating-point math coprocessor $295.

Radius Accelerator
Radius, Inc., 404 E. Plumeria Dr., San Jose, CA 95134, 408/434-1010. 512K minimum memory; Mac Plus recommended. $995.
Radius Full Page Display
Radius, Inc. (See Radius Accelerator for company address and phone number.) 512KE minimum memory: $1995.

The Big Picture

Turbo Pascal

Pages 140 to 145
Mastering Mail Merge

Bulk Mailer

Bulk Mailer+
Version 3.0. Satori Software. (See Bulk Mailer for company address and phone number.) 512K minimum memory; Mac Plus with hard disk recommended: $350.

Client/Mac

Excellent Exchange
Heizer Software, 1941 Oak Park Blvd. #30, Pleasant Hill, CA 94523, 415/943-7667. 512K minimum memory; requires Microsoft Excel; external drive recommended: $4 for catalog and demo/sample program.

Executive Office

(continues)
**Where to Buy**

**FileMaker/FileMaker Plus**

**Market Master for the Macintosh**

**Microsoft Excel**

**Microsoft Word**
Version 3.01. Microsoft Corp. (See Microsoft Excel for company address and phone number.) 512K minimum memory; requires 800K of drive storage; Mac Plus with external drive recommended. $395.

**Microsoft Works**
Version 1.01. Microsoft Corp. (See Microsoft Excel for company address and phone number.) 512K minimum memory; external drive recommended. $295.

**Omnis 3 Plus**

**WorksXchange**
Helzer Software, 1941 Oak Park Blvd. #30, Pleasant Hill, CA 94523, 415/943-7667. 512K minimum memory; requires Microsoft Works; external drive recommended. $4 for catalog and demo/sample program.

**Pages 146 to 149**

**Desktop Design**

**D-Scan CH5312**
Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131, 408/943-9100. Requires Mac II. $12,495 with video interface, $9995 without.

**Lightspeed Color Page Layout System**
Lightspeed Inc., 47 Farnsworth St., Boston, MA 02210, 617/338-2173. 2MB minimum memory. $29,995 (includes Mac II).

**Linotronic 100, Linotronic 300**

**Scannmaster**

**Spectrum 1000/8**

**SuperMac 19" Color Monitor**
SuperMac Technology. (See Spectrum 1000/8 for company address and phone number.) Requires Mac II and video adapter card. $2995.

**Page 150**

**The Original Gets Better**

**PageMaker**

(continues)

---

**A Perfect Fit**

Looking for a spelling checker for Microsoft® Works? WorksPlus™ Spell is the perfect fit. Spell was written by one of the principal developers of the Works program and is so easy to install and use, you'll forget it's a separate program. Spell zips through your documents at lightning speed, hyphenates automatically, and lets you customize both the standard and document dictionaries. Those who have already used WorksPlus Spell say:

"WorksPlus Spell is great! It's so easy to use with Microsoft Works!"
John Frogge, Huntington Beach, CA

"If you intend to buy or already own Microsoft Works, WorksPlus Spell is the clear winner."
SDMUG Resources, February 1987

To get the “missing piece” for your Macintosh™ computer, see your dealer today or call: (800) 233-6851 or in CA (800) 922-PLUS.
(Suggested retail price is $79.95.)

Microsoft® is a registered trademark of Microsoft Corporation. WorksPlus™ is a trademark of Lundeen & Associates © 1986. Macintosh™ is a trademark licensed to Apple Computer, Inc.

Lundeen & Associates
P.O. Box 30038
Oakland, CA 94604

Circle 601 on reader service card
Meet Professor MacTeach™. He's here to introduce you to a unique and effective way to learn software like Excel®, Word 3.0®, and PageMaker 2.0™. You can be "up-to-speed" in about an hour without reading a manual.

These expertly-designed tutorials are available at all levels to match your experience. Each tutorial package contains an audio cassette, practice disk, and summary card. Your skills develop quickly because you learn using the real software, as friendly instructors guide you step-by-step through the various features of each program.

Call the professor at (408) 539-8635, or send in the attached coupon, and learn how easy it is to become truly proficient in the latest software... for less than $50.

You may call collect. Excel and Word are registered trademarks of Microsoft Corp. PageMaker is a trademark of Aldus Corp. Professor MacTeach is a trademark of Personal Training Systems.

Circle 560 on reader service card

---

We're the Leaders in Software Duplication

Just ask the Fortune 500 companies who recently toured Echo Data and picked us over ALL the competition.

They met with management, checked facilities, and asked tough questions about quality control. Our ability to handle "rush" jobs got careful attention.

THEY CHOSE ECHO DATA! Who did YOU just call?

CALL: 800-533-4188 or 215-363-2400

CALL FOR OUR LATEST BULK DISK PRICES...

Maxell—Nashua—Sony—Dysan

** NEW!! C.ITOH Rainbow disks **

DATA SERVICES, INC.
Marsh Creek Corp Center
Lionville, Pennsylvania 19353

Circle 193 on reader service card

---

Complete MIDI Recording Studio!

Compose, arrange and perform your own music on an Apple Mac or Macintosh.

Package Includes:

- Casio CZ 101 8-voice synthesizer keyboard with power adapter
- Passport MIDI Interface™, the industry standard for Apple Mac or Macintosh
- Master Tracks Pro™, the world's most powerful MIDI recording software. Plus two free MIDI cables and free shipping!

Complete Package a $950 value, NOW $699!

Call 1-800-FOR-MIDI (800-367-6434) 10-6 M-F 12-5 SAT

Passport

The Speed of Sound

PASSPORT

Circle 739 on reader service card

---

Yes, send me more information on Personal Training Systems training packages.

Name:

Company:

Address:

City State Zipcode:

Daytime Telephone Number of Macs in Your Office

PERSONAL TRAINING SYSTEMS, PO Box 54290, San Jose, CA 95194, 408-539-8635.
ReadySetGo
Version 4.0 (version 3.0 mentioned in review). Lerraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9075. 512K minimum memory; external drive required for 512K; Mac Plus recommended. $495.

Scoop
Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. $2.9K OR 1.0. 11rg e 1 Software, In c., minimum memory; external drive recommended. $149.

WriteNow for Macintosh
Version 1.0. T/Maker Co., 1973 Landings Dr., Mountain View, CA 94043, -15/962-0195. 128K minimum memory. $175.

Page 152
Easy E-Mail

Desktop Express
Version 1.0. Dow Jones & Company, Inc., P.O. Box 300, Princeton, NJ 08543 609/520-4000, 800/257-3114. 512K minimum memory; requires modem. $149.

Glue
Version 1.05. Solutions International, 29 Main St., Montpelier, VT 05602, 802/229-0368. 128K minimum memory. $55.95.

OfficeTalk
Version 4.12. OfficeTalk, Inc., 345 Montgomery Ave., Bala Cynwyd, PA 19004., 215/664-7400, 800/245-0133. 512K minimum memory; requires modem. Address fee $50; rate for prime time (8 a.m. to 8 p.m. EST) $18 per minute, nonprime time 40¢ per minute. *

Page 153
Statistically True

Systat
Version 3.1. Systat Inc., 1800 Sherman St., Evanston, IL 60201, 312/864-5670, 512K minimum memory. $95.*

Page 154
Printing Potential

MacEnhancer
Version 2.62M. SoftStyle, Inc., 792 Kalanianaole Hwy. #205, Honolulu, HI 96825, 808/396-6368, 800/367-5600. 512K minimum memory. $245.

Microsoft Works

Page 154
Printing Potential

MacEnhancer
Version 2.62M. SoftStyle, Inc., 792 Kalanianaole Hwy. #205, Honolulu, HI 96825, 808/396-6368, 800/367-5600. 512K minimum memory. $245.

Microsoft Works

(continues)
only you can save unprotected software.

Recently, many leading software firms have removed copy protection from their software. They have taken this action for one reason—you, the user, have requested it. You say that unprotected software is less trouble to use, and that it generally simplifies the use of your PC. Many software firms responded and have given you what you requested.

Now the software industry requests something of you. Please do not illegally duplicate unprotected software. Unprotected software enjoys the same legal protection as protected software. It is not a violation of federal copyright laws to make a back-up copy, but making or distributing additional copies for any other reason is against the law.

Remember, many people worked hard to produce every program you use: designers, programmers, distributors, and retailers, not to mention all the people who support users. They have a right to be compensated for their efforts through legitimate software sales. By removing copy protection from their software, publishers are relying upon your good faith—and your trust. They assume that you want the industry to continue developing even better and more innovative software. Please do not abuse the trust the industry has placed in you. Do not make unauthorized copies of software.

Only you can stop software piracy.
Topeka, KS 66601

chases, no membership fees. Just great software at honest prices. Overnight and second single sided disks for only $27.00, (plus 3.00 shipping and handling). Sound too good to be true? It isn’t. We are available. Send $2.50 for our disk catalog with 5 free programs and start getting more bytes for your buck today.

You’ve read about in the pages of Macworld™. You could easily spend a small fortune obtaining those great desk accessories elsewhere, but we’ll send all 200 business applications. At only $3.50 per single sided disk, or $6.00 per double sided disk. No minimum on cash purchases, no membership fees. Just great software at honest prices. Overnight and second delivery service available. Send $2.50 for our disk catalog with 5 free programs and start getting more bytes for your buck today.

To order call: 1-800-436-555
Customer Service: 1-913-271-6022
Also see our directory ad under "Public Domain"

Macintosh is a trademark licensed to Apple Computer, Inc. Please support Shareware software by sending any requested fees to the authors or programmers.

We RENT Mac Software!!
MacStore
800-847-0026

Ask about our frequent renter program!
We’ll match any software rental price in this issue.

Circle 783 on reader service card

Where to Buy

Printworks for the Mac
Version 3.1. SoftStyle, Inc. (see Mac-Enhancer for company address and phone number) 512K minimum memory; requires dot matrix printer. $75.

SuperPaint

Page 155
MacEverything

Cricket Draw

LaserPaint
Version 1.1. LaserWare, Inc., PO Box 668, San Rafael, CA 94915-415/453-9500, 800/367-6898. Key-disk copy protection. 1MB minimum memory, hard disk or external drive recommended. $495.

SuperPaint

Page 157
Dark in the Heart of Texas

OmniLaser 2108
Texas Instruments, Inc., PO Box 2909, M/S 22-40, Austin, TX 78769, 800/827-3500. 512K minimum memory; requires AppleTalk. $599.

Page 158
Film Scoring Simplified

Clicktracks 2.0
Version 2.0. Scores Unlimited, 16 Dean St. #4C, Brooklyn, NY 11201, 718/621-2571. 512K minimum memory. $84.

Circle 16 on reader service card

Circle 17 on reader service card

Page 17

Page 18

Page 19

Page 20

Page 21

Page 22

Page 23

Page 24

Page 25

Page 26

Page 27

Page 28

Page 29

Page 30

Page 31

Page 32

Page 33

Page 34

Page 35

Page 36

Page 37

Page 38

Page 39

Page 40

Page 41

Page 42

Page 43

Page 44

Page 45

Page 46

Page 47

Page 48

Page 49

Page 50

Page 51

Page 52

Page 53

Page 54

Page 55

Page 56

Page 57

Page 58

Page 59

Page 60

Page 61

Page 62

Page 63

Page 64

Page 65

Page 66

Page 67

Page 68

Page 69

Page 70

Page 71

Page 72

Page 73

Page 74

Page 75

Page 76

Page 77

Page 78

Page 79

Page 80

Page 81

Page 82

Page 83

Page 84

Page 85

Page 86

Page 87

Page 88

Page 89

Page 90

Page 91

Page 92

Page 93

Page 94

Page 95

Page 96

Page 97

Page 98

Page 99

Page 100

Page 101

Page 102

Page 103

Page 104

Page 105

Page 106

Page 107

Page 108

Page 109

Page 110

Page 111

Page 112

Page 113

Page 114

Page 115

Page 116

Page 117

Page 118

Page 119

Page 120

Page 121

Page 122

Page 123

Page 124

Page 125

Page 126

Page 127

Page 128

Page 129

Page 130

Page 131

Page 132

Page 133

Page 134

Page 135

Page 136

Page 137

Page 138

Page 139

Page 140

Page 141

Page 142

Page 143

Page 144

Page 145

Page 146

Page 147

Page 148

Page 149

Page 150

Page 151

Page 152

Page 153

Page 154

Page 155

Page 156

Page 157

Page 158

Page 159

Page 160

Page 161

Page 162

Page 163

Page 164

Page 165

Page 166

Page 167

Page 168

Page 169

Page 170

Page 171

Page 172

Page 173

Page 174

Page 175

Page 176

Page 177

Page 178

Page 179

Page 180

Page 181

Page 182

Page 183

Page 184

Page 185

Page 186

Page 187

Page 188

Page 189

Page 190

Page 191

Page 192

Page 193

Page 194

Page 195

Page 196

Page 197

Page 198

Page 199

Page 200

Page 201

Page 202

Page 203

Page 204

Page 205

Page 206

Page 207

Page 208

Page 209

Page 210

Page 211

Page 212

Page 213

Page 214

Page 215

Page 216

Page 217

Page 218

Page 219

Page 220

Page 221

Page 222

Page 223

Page 224

Page 225

Page 226

Page 227

Page 228

Page 229

Page 230

Page 231

Page 232

Page 233

Page 234

Page 235

Page 236

Page 237

Page 238

Page 239

Page 240

Page 241

Page 242

Page 243

Page 244

Page 245

Page 246

Page 247

Page 248

Page 249

Page 250

Page 251

Page 252

Page 253

Page 254

Page 255

Page 256
Cue: The Film Music System

Page 160
Reading by Computer

Portal

Page 161
For FORTH Programmers

Mach 2
Version 2.11. Palo Alto Shipping, P.O. Box 7430, Menlo Park, CA 94026, 415/854-7994, 800/443-6784. 512K minimum memory; 512K with external drive or Mac Plus recommended. $99.95.*

Page 162
Two Electronic Editors

Doug Clapp's Word Tools
Version 1.0. Aegis Development, Inc., 2210 Wilshire Blvd. #277, Santa Monica, CA 90403, 213/392-9972, 800/345-9871. 512K minimum memory; requires 800K of drive storage; hard disk recommended. $79.95.*

Tools for Writers

Page 163
Shareware DA Text Utilities

Grep-Wc
Version 1.1. Public domain software by Paul DuBois, 1220 Capitol Ct., Madison, WI 53706. 128K minimum memory.*

(continues)
Telecommunications

inTalk version 3.0

* Powerful Script Language
* Digital PBX Data Network Support
* Built-in text Editor
* Terminal Emulation
* File Transfers

The latest release of inTalk includes a variety of new high-powered features. The user-interface has been improved greatly allowing the windows to be resized and relocated. Use the text editor, CCL editor and terminal at the same time. The screen drawing speed has been improved. Function Keys are in their own window and can be moved or hidden altogether. The file transfer status window has been improved. The "Connect" protocol has been added for binary file transfers with CDC mainframes. A unique new feature has been added, allowing users to paste graphics and other data to a remote Mac Clipboard. The CCL command language has been given more power. Support for the new Mac SE and Mac II, and the new keyboards has been added.

Where to Buy

miniWriter
Version 1.36. Shareware by Maitreya Design, P.O. Box 1480, Goleta, CA 93116. 128K minimum memory. $12.*

Smart Quotes
Version 1.0. Shareware by Oak Square Publications, P.O. Box 1238, Allston, MA 02134, 617/782-5669. 512K minimum memory: $10.*

Page 164
Using the LaserWriter with the PC

PPRint
Version 1.0. Tangent Technologies, Ltd., 5120 Peachtree Pkwy. #100, Norcross, GA 30092, 404/682-0366. Requires PC (IBM or compatible), AppleTalk, and DB-9 connector. $150.*

TOPS Print
Version 1.08. Centram Inc., 2560 Ninth St. #210, Berkeley, CA 94710, 415/489-5900. Requires 512K PC (IBM or compatible), AppleTalk, and TOPS card for the PC; 640K recommended. $189.*

Page 166
A Pair of Deuces

Magic20
Magic Products, 9709 Brown Ln., Ste. E, Austin, TX 78754, 512/837-8191. 512KE minimum memory; requires SCSI port for the 512KE. $54.5*

Plus-20
Peak Systems, 1201 Spyglass, Austin, TX 78746, 512/328-0747, 800/225-7509. 512KE minimum memory; requires SCSI port for the 512KE. $109.5*

Page 168
More Castle Hassles

ShadowGate
BAR CODE & MAGNETIC STRIPE READERS FOR THE MACINTOSH

• Simple keyboard and ADB interfaces
• Does not affect keyboard operation
• No additional software or port required
• Available for Macintosh®, Plus, SE, II

• Chosen by Apple® for use on Macintosh production lines worldwide
• Bar code printing for ImageWriter™ & LaserWriter™ also available
• Rugged construction, easy-to-use, simple installation
• Magnetic encoders also available
• Applications include point-of-sale, libraries, video stores

Call us today!

9-Track Tape Subsystem for the Macintosh*

Bridge the Macintosh Communications Gap with:
• Mainframes
• Minicomputers
• Microcomputers
• Networks
Qualstar's proven 1/2 inch 9-track MINSTREAMER™ tape subsystem brings full ANSI data interchange to the Macintosh via your SCSI interface port. Now you can exchange data files with virtually any other computer using industry standard 1600 BPI (bits per inch) tape.

9-Track tape, a mainframe standard, is the most reliable backup medium available. 3200 BPI is also provided with this system for high-capacity backup of your rigid disk. The MINSTREAMER tape subsystem includes a tape drive, software, cables, and complete documentation.

Our exclusive QUTAPE software is supplied on a standard 3 1/2 inch diskette and includes ASCII/EBCDIC data conversion, data transfer, blocking/deblocking, screen dump and disk backup utilities.

Qualstar is the market leader in desk-top 9-track tape subsystems. We can provide data interchange solutions for most popular microcomputers including the IBM PC, MicroVAX, 5300, and VME bus systems.

Discover the many advantages 9-track tape has over other Micro/Mainframe links.

Call us today!

Qualstar
9221 Irondale Avenue,
Chatsworth, California 91311
Telephone: (818) 882-5822

©1987 Qualstar Corporation
MicroVAX is a trademark of Digital Equipment Corp.

Open your eyes and see just how many subjects are covered in the new edition of the Consumer Information Catalog. It's free just for the asking and so are nearly half of the 200 federal publications described inside. Booklets on subjects like financial and career planning; eating right, exercising, and staying healthy; housing and child care; federal benefit programs. Just about everything you would need to know. Write today. We'll send you the latest edition of the Consumer Information Catalog, which is updated and published quarterly. It'll be a great help, you'll see. Just write:

Consumer Information Center
Department TD
Pueblo, Colorado 81009
Pages 199 to 212
Getting Started with Networking

AppleShare

AppleTalk Clips

Double Helix 2000

HyperNet 2.0

InBox

InterMail
Version 1.0. Internet, 20 Amy Circle, Waban, WA 02168, 617/965-2339. 512K minimum memory; hard disk recommended. Up to 4 users $299.95, up to 10 users $499.95, unlimited number of users $999.95.

Mail Center

TOPS
Version 3.18.87. Centram Inc., 2560 Ninth St. #210, Berkeley, CA 94710, 415/549-5900. 512K minimum memory; requires AppleTalk; hard disk recommended. $149 per Macintosh, $589 per PC.

Microsoft Word

Mail Center

Red Ryder

TermWorks
Version 1.3. Shareware by James Rhodes, 401 Eastwood, Lufkin, TX 75901. 128K minimum memory; requires Hayes-compatible modem. $20.

Pages 215 to 224
Insights on Microsoft Word 3.0

MockWrite

Pages 229 to 244
Mac Communications Tools

Get More from your Macintosh... for less.

Memory upgrade kits for the Macintosh Plus—Up to four megabytes of RAM, instantly accessible to all your applications with no modification. Completely non-destructive installation uses existing memory expansion sockets. All RamPlus and Ram II™ kits use the new 1 Megabit CMOS DRAM technology.

- RamPlus 2 — Two megabytes $299
- RamPlus 4 — Four megabytes $799

VA: Composite Video Adapter for Macintosh 128 to SE.
Connects your Macintosh Computer to large-screen displays, monitors, and projectors. Completely harmless installation clips in and requires no hole cutting in your computer case.

- VA-Plus for the 128 to Plus $99.95
- VA-SE for the Macintosh SE $149.95

Memory expansion kits for the Macintosh SE and Macintosh II—Up to 8 megabytes additional memory for the powerful new members of the Macintosh family. Install in minutes, and are completely compatible with all internal enhancements.

- Ram II — Two megabytes $599
- Ram II +II — Four megabytes $999
- Ram II/s — Two megabytes $699
- Ram II +II/s — Four megabytes $1199

(SCSI port for the Macintosh 512c

$99.95

RESELLER INQUIRIES INVITED

OPEN MAC Enterprises
140 Mason Circle, Suite H
Concord, CA 94520
415/682-0440

Terms:
- Prices reflect cash discount for prepaid orders.
- Discover, MasterCard, Visa, and AMEX accepted.
- COD orders accepted.
- Educational & Institutional Orders Accepted (Status Verification Required)

Macintosh and Apple are registered trademarks of Apple Computer Inc. RamPlus, Ram II, and SCSI-Mac are trademarks of Open Mac Enterprises.

Circle 718 on reader service card

September 1987
MacLinkPlus™ ... Connectivity to the IBM PC plus ...

- It's a complete "kit" for exchanging files between the Macintosh and the IBM PC (and compatibles)
- Connects to the PC's serial port using modems or the included cable ... or over AppleTalk when used with a Server or Network Product
- Contains an extensive library of translators to convert word processing formats, spreadsheets and data base information
- Full visibility into remote disks and directories
- TTY terminal emulator for general communications
- $195 includes Macintosh software, PC software, built-in translators, manual and cable
- Wang and NBI options available

DataViz Inc.
16 Winfield St. • Norwalk, CT 06855 • 203-866-4944

The Zericon Model 3600-D Plotter
Astounding price and performance for only $2295.

Zericon declares it comparable to other models:
- Price: a full $1,000 less than the nearest competitor
- Compatibility: operates with all popular CAD software supporting RS/2109
- Speed: at 7 inches per second, the 3600-D offers the best price-performance ratio in the class
- Resolution: 104 pixels assures you of drawing quality you can be proud of
- Unique X & Y axis scaling allows you to calibrate to 1 part in 10,000 ideal for applications where scale accuracy is critical.

CALL NOW AND WE'LL SEND YOU A FREE SAMPLE PLT.
(415) 496-8360

ZAP Computer Supplies
10005 Muirlands Ste. M+8
Irvine, CA 92718
Add $10.00 shipping and handling, CA residents: add 6.5% sales tax

Circle 726 on reader service card

A Macintosh™ SCSI Hard Drive.
For the Price of a Apple™ 800k floppy drive!

ZAP SS/SCSI Drives:

<table>
<thead>
<tr>
<th>Drive Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZAP SS-10</td>
<td>$399.99</td>
</tr>
<tr>
<td>ZAP SS-40</td>
<td>$799.99</td>
</tr>
<tr>
<td>ZAP SS-70</td>
<td>$1,199.99</td>
</tr>
<tr>
<td>ZAP SS-100</td>
<td>$1,499.99</td>
</tr>
</tbody>
</table>

All ZAP SCSI Hard Drives come complete (plug & go)
- Utility Software
- Pre-formatted drive
- Software Manual
- Cables
- 120 Day Warranty

Call and order your complete SCSI drive today.
(714) 581-4980

Add $10.00 shipping and handling, CA residents: add 6.5% sales tax

Circle 795 on reader service card
## Macworld Best-Sellers

### Business Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>11*</td>
<td>5</td>
<td></td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>6</td>
<td>7</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>7</td>
<td>1</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### MacWrite
Apple Computer

#### FullPaint
Ann Arbor Softworks

#### MacDraw
Apple Computer

#### Cricket Draw
Cricket Software

#### Filemaker Plus
Forethought

### Education Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Math Blaster
Davidson and Associates

#### KidsTime
Great Wave Software

#### Masterlyte
Scarborough Systems

#### Typing Tutor III
Simon and Schuster Software

#### Early Games
Springboard Software

### Entertainment Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>2</td>
<td>11</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Flight Simulator
Microsoft

#### Dark Castle
Silicon Beach Software

#### MacGolf
Practical Computer Applications

#### Gato
Spectrum Holobyte

#### Shanghai
Activision

### Networking/Data Communications

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### AppleTalk
Apple Computer

#### TOPS
Centram Systems

#### MacServe
Infosphere

#### AppleShare
Apple Computer

#### PhoneNet
Farallon Computing

### Hard Disk Drives

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td></td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td></td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td></td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Apple Hard Disk 20/20SC
Apple Computer

#### DataFrame 20
SuperMac Technology

#### Macintosh Internal 20SC Hard Disk
Apple Computer

#### Rodime 20 Plus
Rodime Peripheral Systems Division

#### FX-20
General Computer

### Books

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1</td>
<td></td>
<td>10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td></td>
<td>11</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Excel In Business
Douglas Cobb, Microsoft Press

#### Inside Macintosh
Addison-Wesley

#### The Printed Word
David A. Kater and Richard L. Kater, Microsoft Press

#### Microsoft Macinations
Mitchell Waite, Robert Laffre, and Ira Lansing, Microsoft Press

#### Macintosh Bible
Dale Coleman and Arthur Naiman, Goldstein & Blair

### Product Watch

**Editors' choice:** Other recent products of particular interest.

- EtherTalk: Apple Computer Ethernet adapter board
- HyperCard: Apple Computer information-organizing tool kit (software)
- NetModem: Shiva Corporation AppleTalk modem

*Source: Exclusive InfoCorp survey of more than one hundred Macintosh retailers and selected mail-order suppliers. Covers sales during May 1987. Formerly bundled with the Mac.*
The Word is Out...

"Absolutely AMAZING word processing program. I want it WriteNow!"
Robert Forras, MacTimes

"WriteNow feels perfect… It's hot. Highly recommended. This is THE word processor to use if you use a Mac."
John Dvorak, San Francisco Examiner

"Right now, WriteNow comes the closest to delivering on the promise of future word processing."
Michael Miller, InfoWorld

"This is the word processor that we designed and built Macintosh for."
Steve Jobs, NeXT Inc.

"T/Maker's WriteNow for Macintosh is a polished word processor that retains the elegance of MacWrite but adds features like multiple windows, footnotes, multiple columns, and a spell checker."
Dan Farber, MacWorld Magazine

"...WriteNow adds up to a great new word processor. Its ease of use and speed put it way ahead of Microsoft Word and MacWrite for most jobs."
Vicky Jo Varner, The MACazine

Best New Word Processor
MacUser Magazine 1986

Performance Word Processing for the Macintosh

To learn more, see your local computer dealer today; or call or write to:
T/Maker Company, 1973 Landings Drive, Mountain View, CA 94043 (415) 962-0195

Suggested retail price of WriteNow For Macintosh is $175. Runs on any Macintosh.

T/Maker is a registered trademark of T/Maker Co. WriteNow is a trademark licensed to T/Maker Co. Macintosh and MacWrite are trademarks of Apple Computer, Inc.

Circle 332 on reader service card
Macworld World Class Award – Best Input Device

Turbo Mouse.™
Twice the speed, in half the space.

Finally, a Mouse that's really quick. One that doesn't require a lot of room on your desk. One that's easy to use, even on a desk full of papers. Turbo Mouse from Kensington.

Turbo Mouse turns mouse technology upside down. It puts the mouse ball on top, rather than on the bottom like a standard mouse. You move only the mouse ball, not the whole mouse. That's why Turbo Mouse is quicker, quieter, and easier to use.

Turbo Mouse doesn't get its speed only from this ease of use. It has an automatic acceleration feature that senses the speed at which you are working and moves the cursor further when you move the mouse ball faster.

Turbo Mouse has two mouse buttons - one for right-handed users and another for lefties. And, since it's only 4" x 6", Turbo Mouse will fit neatly at the end of your keyboard.

For Macintosh™, Mac Plus, Apple® Ile, or Ilc, ask for model 62350.
For Macintosh SE, Mac II, or Apple IIIGS, ask for model 62352.
For more information, or a dealer near you, call (800) 535-4242.
In NY (212) 475-5200.

KENSINGTON.®