MacUser's NetWorkShop reveals 10 crucial network solutions for the '90s

Word Processors
Best-Buy Bargains

2,400 bps Modems
Fast and affordable

Plus Reviews of:
Aldus PrePrint Desk Hookup!
4D Compiler Kodak's color printer and more!!!
The largest word history got there
When we introduced Microsoft Word six years ago, we weren't planning on making history.

We had just one goal, and a fairly simple one at that: to make a word processor that suited people's needs.

Then again, we knew that the people we wanted to suit were a wildly diverse, independent lot: Mac® users.

So it made sense to let them tell us exactly what to put into Word.

Which they did.

First, there were some folks who didn't like tabbing much. Fair enough. For them, we developed Tables—an easier way to set up side-by-side paragraphs, columns of numbers, even forms. No tabs. No hassle.

Then we heard from a few more people. “Love the Tables gig,” they said. “Now, about this text-numbers-graphics combo all in one document...”

We made that simple with “warm links.” Once you've linked Microsoft Excel data to a document, keeping that document updated with the latest Microsoft Excel figures is easy. Just click your mouse.

Then there were those senders of mail, who didn't want to click-click-click-click-click-click.

So we built support for Microsoft Mail right into Word. Now, with just a click, everyone stays in the loop. And work in progress stays in progress.

As it happens, listening to what Mac users want is a pretty good way to design software.

How else can we explain Word version 4.0 being the most popular word processor in Mac history?

And those cards and letters are still coming. “Listen,” someone'll say. “In case you're working on the next Word...”

Which we are. In fact, if you've got some input for us, feel free to drop us a line. Or if you'd like to find out more about Word, call us at (800) 541-1261, Department P22.

Our goal is still simple: to make Word the best word processor around. With the latest technology—translated into human terms, of course.

After all, we're only making history because we make word processors the way you like 'em.
Take a guided tour of connectivity technologies in the MacUser Labs NetWorkShop.

The humble modem evolves into a high-performance communications tool.

Consumer crusader David Horowitz tells how to be a savvy Mac buyer.

Word processing has never been so easy — or inexpensive.

Networking the '90s
BY JOHN RIZZO AND JON ZILBER
If you share electronic information with other computer users, your business depends on your network connections. Here’s a primer on the top technologies to get you plugged in to the '90s.

Thoroughly Modern Modems
BY STEPHEN SATCHELL AND THE MACUSER LABS STAFF
A modem is a modem, is a modem, right? Nope; new technologies and features translate into significant differences among high-end 2,400-bps modems. We pushed eight Mac-specific turnkey packages to their limits and discovered that the best 2,400-bps modems deliver close to 9,600-bps throughput. If you like getting four times what you bargained for, read on.

The Best of UNIX and the Mac: A/UX 2.0
BY ALEXIS ROSEN, JEFF PITTELKAU, AND THE MACUSER LABS STAFF
A/UX is the most interesting and impressive software from Apple since HyperCard. And it’s the only UNIX system that offers a large base of productivity applications that offer cut-and-paste compatibility among UNIX files.

The Invisible Bridge to Mainframe Data
BY VERNON KEENAN, PAUL YI, AND THE MACUSER LABS STAFF
If you want to access your firm’s mainframe-based data with your Macintosh and if you want the mainframe to shoulder most of the task of finding that data, you’re in luck — Apple’s DAL, Oracle’s SQL*Net, and TechGnosis’ Sequelink all do it well, although in quite distinct ways.

Best-Buy Bargain Word Processors
BY CHARLES SPEZZANO, KELLI WISETH, AND THE MACUSER LABS STAFF
Not everyone is writing novels or thick corporate manuals. (And even those who may want a simpler tool for smaller jobs.) There are now four good low-cost word processors to choose from — Claris MacWrite II, the word-processing module of Microsoft Works 2.00, New Horizons WordMaker 1.01, and T/Maker WriteNow 2.2 — plus several shareware products.

Buying Smart
BY SHELLEY ZULMAN
Puzzled about buying computer gear, finding good dealers and mail-order firms, decoding warranties, and figuring out what to do when a company goes bankrupt? Here’s how to stretch your dollars and shrink your anxieties, along with advice from the host of the syndicated TV show “Fight Back! with David Horowitz.”
Departments

Jon Zilber
Taming the mouse menace ...................................................31

Robert R. Wiggins
The Mac has a dirty little secret: instability .........................41

Guy Kawasaki
How many spaces should go between sentences? ...................57

John C. Dvorak
Apple is doomed — to succeed .............................................346

Letters
Weenie computers or weenie columnists? ............................13

Advertiser Index .................................................................292

Marketplace .........................................................................328

Reviews

Kodak XL7700
Kodak ushers in a brand-new era of true photographic-quality printing with this continuous-tone color printer. But it’s not exactly cheap .................................................62

4D Compiler
Imagine the versatility of 4th Dimension combined with pure, unadulterated speed? Stop imagining; it’s already here, thanks to what may be the single most important tool of all time for 4th Dimension developers. ..................65

Aldus PrePrint
If consistent color separations for PageMaker are what you need, then PrePrint’s the utility that might finally make it possible .........................................................70

Desk
It’s seven ... seven ... seven DAs in one! But although this combination program takes aim at Microsoft Works, does it add up to the sum of its parts? ...........................................74

TelePort A300
Elegant is the word for this inexpensive and feature-packed 2,400-bps fax modem that even saves you a port by plugging in to the ADB port along with your mouse and keyboard ..................................................79

HookUp!
The hobby-shop electronic-module kits of yesteryear meet the age of multimedia in this novel icon-oriented programming tool for all ages ..............................................83

Project Scheduler 4
Project-management specialists — especially those working in mixed Mac and PC environments — will discover that this new entrant offers an impressive set of features but some interface frustrations as well ..................86

“WELL, see, the drive on my IIci went out on me. I took it to my regular dealer, who immediately replaced the drive at no cost and then treated me to dinner and a movie before driving me home.” ..........................................178
NOW MICROSOFT® WORD
CAN PRODUCE BUSINESS CHARTS!
(AND SO CAN PAGEMAKER®,
MACWRITE® II AND MACDRAW® II)

Announcing Cheshire, the Macintosh utility that extends the power of your favorite applications.

Drop Cheshire into your system folder, and Microsoft® Word, PageMaker®, MacWrite® II and MacDraw® II suddenly have powerful charting features. Which means you can produce over 20 types of professionally designed business charts... without switching to a separate program... or using a DA.

And because Cheshire works as part of your application, it’s truly easy to use. In just seconds, you’ll have great-looking charts in your correspondence, memos, reports, newsletters, presentations and more.

So don’t let charts slow you down, install Cheshire. It’s not a new program... just more power for the ones you already own.

Cheshire works on all Macs. It’s available in most software catalogs, or visit your local dealer. If you need more information, call us at 800.552.9157 or 914.747.4171.

ABBOTT SYSTEMS
© 1991 ABBOTT SYSTEMS, INC. All rights reserved. Cheshire® is a trademark of Abbott Systems, Inc. All trademarks are registered in their respective owners.

Please circle 128 on reader service card.

Ziff-Davis Publishing Company

President William B. Ziff, Jr.
Executive Vice President Eric Hippeau
Senior Vice President, Marketing
Paul H. Cheok
Vice President, Operations Baird Davis
Vice President, Business Manager
T. L. Thompson
Vice President, Circulation Bert Lacy
Vice President, Circulation Services
James Ramaley
Vice President, Creative Services
Herbert Stern
Vice President, Marketing Services
Ann Pellek Adelman
Vice President, Production
Roger Herrmann
Vice President, Research
Marian O. White
Vice President, James Stafford
Group Vice President, PC Publications
J. Scott Briggs
Director, Classified Sales
Paul Stafford
Director of Planning Gary A. Gustafson
Production Director Walter J. Terlecki

Ziff Communications Company

Chairman William B. Ziff, Jr.
Vice Chairman Philip B. Korsant
President Kenneth H. Kopko
Executive Vice President Philip Sine
Senior Vice President Hugh Tietjen
Vice President, General Counsel, and Secretary
J. Malcolm Morris
Vice President, Controller, and Treasurer
Patrick J. Burke, Jr.
Vice Presidents Steven C. Feinman, William L. Phillips, Seth R. Alpert

Circulation

Subscription Director Charles Mast
Single-Copy Sales/Marketing Director
James E. Gerth
Business Director Becca Hoblin
Customer Service Michael Crennan

Founding Publisher Felix Dennis

Entire contents © 1991 Ziff-Davis Publishing Co. All rights reserved; reproduction in whole or in part without permission is prohibited. MacUser is a registered trademark of Ziff Communications Co. The following are trademarks of Ziff Communications Co.: Mainstream Mac, Pinpoint Mac, Quick Clicks, MacUser Labs, Open Windows, Devil’s Advocate, Help Finder, Control Panel, NetWorkShow, Bridges, Scrapbook, Macintosh Analyst, MiniFinder, StartUp, Power Tools. MacUser is an independent journal, not affiliated in any way with Apple Computer, Inc.

Printed in the U.S.A.

In Memory of
and
Derek Van Alyne 1967–1989
It’s like owning a disk drive with a bulletproof vest.

Introducing the Metro with SCSI Sentry

EMAC has found a way to prevent unnecessary Macintosh hard drive fatalities with SCSI Sentry," an engineering breakthrough in disk drive reliability. It protects your disk drive from damaging shorts that can trap data inside your hard disk. Which makes any drive with the SCSI Sentry substantially more reliable.

And only EMAC Metro drives have it.

Metros are zero-footprint disk drives – so they fit perfectly under a Mac Plus or SE. You can also stand Metro on its side next to any Mac II, keeping your desk free for papers, phones, or photographs.

But Metro’s engineering goes far beyond pure aesthetics. With some of the most stringent testing in the market – and mean-time-between-failures ratings of 50,000 to 70,000 hours – these drives were built to keep you up and running. And, if your Metro drive ever does have problems, our modular design makes diagnosis and repair quick and easy.

When you add the SCSI Sentry to such reliable disk drives, you know your data’s safe with Metro. If you want to own a disk drive with a bulletproof vest, call EMAC at 1-800-821-0806, extension 2222, (In Canada, 1-800-663-5161).
Put an end to the envelope hassle!

Set a default return address or logo.

Save commonly used addresses in a convenient pop-up menu.

Perfectly positioned address in your choice of font, style, and size.

Optional US Postal service tested barcodes on laser printers speed-up your mail.

“Cool little products such as KiwiENVELOPES! make the world a slightly better place to live.”

Guy Kawasaki, MacUser, Nov 1990.

“It turns out a perfectly addressed finished product... and it has about a two-minute learning curve.”

Cynthia Harriman, MacWorld, May 1990.
If You Have

On

In

And

You Need

The Network Communications Solution.
EtherGate is the only EtherTalk™/LocalTalk™ gateway
that also supports wide-area internetwork routing, Dial-In
Network Access™ from a single remote Mac or PC and inter-
network serial device sharing. One at a time. Or all at once.

The Global Internetwork.
EtherGate lets you link remote EtherTalk™ and LocalTalk™
LANs, no matter where they are. With a modem, EtherGate
can communicate asynchronously over dial-up lines, or
synchronously over dedicated lines or ISDN. Dial-In Network
Access™ allows a single remote Mac or PC to use inter-
network resources and files. From across the street. Or across
the country.

The Productive Internetwork.
Macs and PCs can also share serial devices through
EtherGate. Just plug one or two printers, plotters, modems or
other serial devices into an EtherGate, and they’re available
to the entire internetwork. Over EtherTalk.™ Or LocalTalk.™

The Network Communications Company.
Whatever your network communications needs, Shiva has
solutions. Including the popular FastPath 4 gateway, with
versatile K-Star software, for networking environments such
as DECnet and TCP/IP. For more information about
EtherGate, FastPath and other Shiva products, call
1-800-458-3550.

EtherGate™ by Shiva
We're Putting Networks To Work®
One Cambridge Center, Cambridge, MA 02142

All product names are trademarks of their respective manufacturers.
In a shakedown of removable storage devices, one drive quickly rises to the top. The new 44MB Bernoulli® Transportable. A revolutionary drive that delivers truly reliable hard-disk-like performance. Day in and day out. Whether in the office or on the road.

Bernoulli’s patented design spins a flexible disk at high speed, drawing it up to the read/write head. Which, unlike hard disks, makes Bernoulli virtually head-crash free. Should the drive encounter a jolt or dust particle, the disk falls harmlessly away from the head, making Bernoulli the toughest, most reliable removable system available.

Period.

The numbers tell the whole story. Bernoulli drives have an unbeatable MTBF of 60,000 hours, twice that of our competition and 20 percent better than the most popular Winchester drives, putting Bernoulli in a class with the best hard drives.

Bernoulli’s 44MB disks can take 1,000Gs of shock force — an 8-foot drop or all kinds of road abuse. And we back that up with an unprecedented Gold Standard five-year disk life guarantee.

The Transportable’s performance puts you in the fast lane, too. A high transfer rate, together with Bernoulli’s intelligent buffer and user-configurable cache, give Bernoulli exceptional real-life performance.

If you’d rather go cordless, there’s a battery-powered version, which, like the Transportable, fits neatly under a Macintosh SE. And now, Bernoulli takes your dollar the extra mile with dramatically reduced prices (as much as 20 percent lower) that affect the entire Bernoulli family, including the dual.

Which all adds up to one thing: Bernoulli’s closest competition isn’t close at all.

So call 1-800-289-4032 for free literature. Because no matter what road you travel, Bernoulli is the only system that can take it. Over the long haul.
AND NOW WE’LL TRANSFORM THIS,
AND THIS,
AND EVEN THIS,
INTO THIS,
WITH JUST THIS.

Intouch organizes your names, addresses, phone numbers, and notes faster and easier than you can pull a rabbit out of a hat.

For only $69.95, you can put unlimited names, numbers, and notes into a convenient Desk Accessory. Without any set up or programming. So you can dial your phone, print envelopes and labels, even time and date-stamp your notes at a moment’s notice.

If you want to get organized magically, it’s time to get Intouch. Call Advanced Software at (800) 346-5392.

No Mac Is an Island

It was time to expand our lab facilities. We needed to test more and more products under rigorous laboratory conditions. The most pressing research topics—in terms of reader interest and testing difficulty—were networking and connectivity. So we constructed a new half-million-dollar facility to explore these areas and more.

Sounds easy. It wasn’t. But the MacUser Labs NetWorkShop connectivity center is finally a reality. It’s come a long way from our first network-testing facility, which overflowed from a cubicle to two cubicles; to two cubes and a corner office; and finally into a custom-built, state-of-the-art, dedicated laboratory for testing Macintosh networks under the real-life conditions of mixed platforms.

Henry Bartman, our technical director, spearheaded the effort. His right-hand man for the past year and a half has been project leader Stephan Somogyi. In addition to being a networking and connectivity maven of note, Stephan is also our resident software-development expert and the author of the Labs’ standard hard-disk-benchmark program, DiskBasher!

Stephan has compiled some of the NetWorkShop’s industrial-strength statistics: The NetWorkShop includes more than 30 Macs, a NeXTcube, a Sun SPARCStation IPC, a DEC MicroVAX 2000 and a VAXserver 3100, a Compaq 386/33 Deskpro and a Compaq Deskpro 286, a Zeos 386, and an IBM PS/2 Model 80. These machines run a variety of operating systems—including DOS, OS/2, Windows, and A/UX 2.0 (Apple’s flavor of UNIX) mounted on an Ilfx—and multituser network packages—including Novell NetWare and 3Com 3+ Open file servers. Even the lab’s windows are special: The electrostatic windows go from transparent to opaque with the flip of a switch, maintaining privacy and security for the evaluation of trade-secret prerelease products.

But the real beauty of the MacUser Labs NetWorkShop is the way the lab team organized and linked the dozens of machines. For example, the modular-Macintosh CPUs are packed together like San Francisco row houses and are stored on specially designed carts with rollout shelves below the tabletops for maximum access. Stephan and Henry linked the CPUs by first assigning each machine a junction box with four jacks: one for LocalTalk, one for twisted-pair Ethernet, one for token ring, and an extra one for modem connections or other twisted-pair-based applications. The junction boxes were then linked to patch panels that can easily be switched and reconfigured from a central location.

All told, it took more than 30 miles of wiring to complete the lab; it’s just one more way that MacUser Labs goes the extra mile—or 30—to get the job done.
Unlocking Corporate Data

ORACLE for Macintosh gives users direct access to PC, mini, and mainframe databases.

We all remember 1984, when Macintosh promised to put the power into the hands of the rest of us.

Well, it's taken six years, but the door to the corporate vault is open.

Now, the full power of corporate data is easily accessible to anyone with a Macintosh. More specifically, anyone with Macintosh and ORACLE.®

Using ORACLE for Macintosh, Mac users can now point and click their way into, around and out of just about any mainframe, mini, workstation or PC database. That includes any data stored in DEC's RMS, IBM's DB2 and SQL/DS.

They can do it without the limits of Mac-only databases or the masquerade of terminal emulation. In fact, they can do it right from their favorite Mac programs like Microsoft Word and Excel. And they can do all this without compromising the systems administrator's control over access and security.

As for Macintosh developers, ORACLE lets them work in flexible programming environments including HyperCard, SuperCard, PLUS and Acius's 4th Dimension. To name a few.

And all Oracle products are backed by a 30-day money back guarantee. As well as the largest database service and support organization in the world.

Call us at 1-800-633-0516 Ext. 7611 for ORACLE for Macintosh or ORACLE for 4th Dimension.

Or sign up for an Oracle Client/Server Forum in your area. At last, Apple's promise has come to fruition.

ORACLE®

Compatibility · Portability · Connectability

ORACLE is the most often accessed database among sites with Macs connected to minis or mainframes.

©MacWeek August 7, 1990.
Upgrade From Turbo Pascal To THINK Pascal™ For Only $99.

If you want to write Pascal programs that take advantage of Apple's latest hardware and software, or give object-oriented programming a try, you'll never be able to do it with Turbo Pascal. Because according to Borland (on CompuServe), Turbo will never be upgraded again.

That's why until February 28th, 1991 we'll upgrade you from any Macintosh Turbo Pascal to THINK Pascal for only $99. A savings of 60% off our regular $249.

The #1 Pascal On The Mac.

Just call Symantec at (800) 228-4122 Ext. 802 and have your copy of Turbo Pascal handy. We'll send you THINK Pascal, the fastest Pascal on the Mac.

THINK Pascal saves you time with a text editor that formats code automatically as you type it in. Its source level debugger makes finding bugs quick and easy. And because it can compile up to 44,000 lines per minute and link any file in under 2 seconds, you can see the results of your programming as you program. All of which makes THINK Pascal the fastest way to finished software. And the #1 Pascal on the Mac.

The Pascal Of The Future, Today.

Unlike other companies, we're committed to Macintosh programmers. We offer frequent upgrades, and even now, are working closely with Apple so that when System 7.0 arrives, you'll have programming tools to take advantage of it.

We give you unlimited free telephone support, ideas and help on CompuServe and AppleLink, even a dedicated user group: SPLA-Symantec Programming Languages Association.

And if that's not enough, we'll even teach you how to program with Just Enough Pascal, our optional interactive training software that steps you through the basics of Pascal while you create a real, working game.

So pick up the phone and give us a call. But hurry. Because on March 1, our $99 offer on the Pascal of the future is history.

Trade Up Today, Only $99. Call (800) 228-4122 Ext. 802F For More Information

Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600. THINK Pascal is a trademark of Symantec Corporation. Other brands and products are trademarks of their respective holders. © 1990 Symantec Corporation.
A Retouch of Evil

Ken Milburn's roundup of color-image-retouching applications ("What a Color-Image-Enhancing Program Can Do for You," October '90, page 172) was technically informative, but I find it irresponsible to devote 12 full pages to image enhancement without one word on the ethical or legal considerations involved in electronic-image manipulation.

It's vitally important to preserve the integrity of photographic images used in an editorial setting. The message you're giving your readers is that if executives don't like their body, it's easy to just scan in another photo and — presto — they'll have whatever physique they want.

Advertising and promotional situations call for different standards, but for anyone involved in an editorial setting — such as an in-house publication, high school newspaper, or other member of the mainstream media — I urge development of a policy that controls the use of photographic manipulation.

Dave Seibert
Phoenix, AZ

In Vivid Color

Yours is the fourth review of PageMaker 4.0 that I've read (see review, September '90, page 46), and not one has mentioned that Aldus dropped the CYMK color-calibration model that was introduced in Color Extension. What's going on? Am I the only one who places any importance on CRT color accuracy?

I think Aldus has made a significant marketing blunder, because PageMaker's much-touted Pantone color-matching system is rendered virtually useless for anything but color laser printing.

The issue, as I see it, is whether a software manufacturer, after assembling a large customer dependency, has the right to arbitrarily decide which features should be included (or excluded) in future releases of its product without first conducting a user referendum on changes that significantly alter the way the software works.

Walter Blady
Toronto, Ontario
Canada

According to product manager Mark Craemer, PageMaker 4.0 doesn't have a monitor-calibration feature because "it doesn't adequately address the complex problems of color calibration. We were misleading people into thinking this was an appropriate solution, and it wasn't." The bungled calibration feature involved matching screen colors to those on a monitor-adjustment card. This is a crude, inaccurate method for several reasons, one being that the colors on
the card can vary greatly from those produced by your combination of printer, paper, and ink. More sophisticated (and more accurate) calibration options are now available from Radius, Tektronix, and SuperMac. If you still want this sort of rough calibration, however, there’s a simple workaround. Create a document containing boxes filled with the desired colors, print it, and adjust your monitor to match the paper output. And the best way to get Aldus’ ear is through a user group: in fact, the national PageMaker User Group is cosponsored by Aldus. To join, call (800) 874-4113, ext. 25. — AA

Yes, I Scan

As a very content user of Logitech’s hand-held scanner, I have to add the following two things to your article “An Inside Look at Scanners” (September ’90, page 132): First, there’s a nifty feature that lets you scan a graphic from left to right as though it were going from top to bottom; it’s not only a timesaver but is also a great feature for those of us with limited RAM. I often scan graphics that are too wide to rotate in memory. Without this feature, I had to scan them in several strips, rotate each strip, and re-arrange them to get the same result.

Second — and more important — you don’t need a new head to use the new software, 2.0, which has 32 levels of gray. The new software works with the older models. Approximately a year after buying my scanner, I received the new software from Logitech free of charge — and even without ordering it. Big applause to Logitech for this great service!

Gernot P. W. Hecht
Nürtingen, Germany

Support Your Local Mac

I concur with Thom Hogan’s message to Apple in “The Self-Supporting Mac” (October ’90, page 263). Customer support is essential — not just because it’s the right thing to do or because it’s an effective sales tool. Customer support is essential for the feedback it can give developers on how the machines are used and on what works and what doesn’t.

Bugs that get past quality assurance are found more quickly and fixed more easily if users are encouraged and trained to report them promptly and in detail. When developers know how users work, they can create enhancements and new programs that are truly useful.

I used to wonder how customers did useful work using imperfect systems. Now that I’m a Mac user, I have the opportunity to do just that as well as to experience customer support from the outside. Companies that skimp on customer support or that are arrogant or defensive toward customers who have problems are shortsighted; the companies will suffer more than the customers. The first signs of trouble at Wang Labs, where I worked for six years, were complaints about customer service.

Simon L. Klein
Chelmsford, MA

Getting Behind ISDN

I liked Stephan Somogyi’s introduction to ISDN (Integrated Services Digital Network) (“Coming Soon to a Mac Near You: ISDN,” October ’90, page 227). One statement jumped out at me: “Compared with Europe and Japan, the U.S. is lagging behind.” After living in Japan for six years, I returned here last year and was immediately shocked by the same observation. An entire article on that topic would be very useful. Japan’s lead in setting up ISDN will give it a significant competitive edge in all areas of business at a time when the U.S. cannot afford yet another Japanese advantage.

John Elemons
76106,3443 via Zmac

Ready, Set, Prepress

The assertion that Mac color is not yet ready for prime time (“Prepress: The OPI Option,” October ’90, page 219) is not true. We are currently doing 90 percent of our color work on the Mac and hope to be doing 99 percent by the end of 1990.

OPI allows you to crop an image irregularly, if you have the proper software. Mac users will need to wait for the release of FreeHand 3.0 to see that.

The catch-22 situation you mention isn’t a problem for us, because we don’t go to the “high end” and all good designers know the approximate size they want to use when an image is scanned.

I do realize that we are one of the few places that do their everyday publishing on the desktop, but it’s wrong to say that it can’t be done just because most companies don’t do it. We produce everything in-house on the Mac, from promotional brochures to catalogs to kindergarten books to physics books.

Alan Ordway
Pensacola Christian College
Pensacola, FL
Power Defined.

Master the power of your software quickly as your own private tutor talks you through the software, step by step. With your hands on the keyboard, trying each new skill as it's explained, you'll learn quickly and thoroughly. Our interactive, hands-on tutorials are available for:

- Macintosh Basics
- Excel 2.2 or 1.5
- FileMaker Pro or II
- FreeHand 2.0
- HyperCard 1.0-1.2

We offer beginning, intermediate and advanced tutorials for each of these software programs, so there's sure to be one that meets your needs.

Use the training that Apple uses for its own employees, and sells under its own name in Australia, Canada, New Zealand, and the United Kingdom.

If you're looking for a fast, convenient, affordable way to unleash the power of your software, call us at 1-800-TEACH-99 or 408-559-8635 and we'll send you a complete catalog — at no charge.

Please circle 81 on reader service card.

© 1989 Personal Training Systems. All Rights Reserved.
The following are registered and unregistered trademarks of the following companies: Apple, Macintosh, HyperCard - Apple Computer Inc.; Claris, FileMaker II - Claris Corp.; Adobe Illustrator - Adobe Systems Inc.; Adobe, Persuasion, PageMaker, FreeHand - Mike Grady Systems; Microsoft, Excel, Microsoft Word, Microsoft Works - Microsoft Corporation; Personal Training, Personal Training Systems - Personal Training Systems, Inc.
Orders placed by 9pm EST (6pm PST) shipped same day!

Where savings are huge and advice is free. Why buy anywhere else?

ACCOUNTING & PERSONAL FINANCE

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Illustrator 3.0</td>
<td>$338.00</td>
</tr>
</tbody>
</table>

Picture Link... $215.00

MicroTouch

The MicroTouch is an unslav... and uncluttering. With no mouse to locate, orient, roll, you don't lose any desk space.

UnMouse... $185.00

DynaWare

DynaPerspective will give you new insight into your drafting and CAD work! With DynaWare you can generate a 3-D extrap... dimensions, detect... this object tool that allows direct, on-screen entering and manipulation.

DynaPerspective... $691.00

MacZone VALUE PACK:

- Guaranteed Product Availability
- $3 Overnight Delivery
- Free UPS Ground Shipping
- 30-60 Day Money Back Guarantee on Most Products
- Low Prices
- Knowledgeable MacZone Advisor

Order Toll Free 1-800-248-0800
<table>
<thead>
<tr>
<th>HARD DRIVES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Quantum</strong></td>
<td></td>
</tr>
<tr>
<td>40MB External</td>
<td>428</td>
</tr>
<tr>
<td>60MB External</td>
<td>598</td>
</tr>
<tr>
<td>80MB External</td>
<td>679</td>
</tr>
<tr>
<td>105MB External</td>
<td>756</td>
</tr>
<tr>
<td>120MB External</td>
<td>758</td>
</tr>
<tr>
<td>170MB External</td>
<td>928</td>
</tr>
<tr>
<td><strong>Cutting Edge</strong></td>
<td></td>
</tr>
<tr>
<td>32MB External</td>
<td>309</td>
</tr>
<tr>
<td>33MB External</td>
<td>378</td>
</tr>
<tr>
<td>45MB External</td>
<td>424</td>
</tr>
<tr>
<td>60MB External</td>
<td>468</td>
</tr>
<tr>
<td>80MB External</td>
<td>520</td>
</tr>
<tr>
<td>100MB External</td>
<td>590</td>
</tr>
<tr>
<td>120MB External</td>
<td>680</td>
</tr>
<tr>
<td>155MB External</td>
<td>685</td>
</tr>
<tr>
<td>210MB External</td>
<td>750</td>
</tr>
<tr>
<td>330MB External</td>
<td>898</td>
</tr>
<tr>
<td><strong>Quantum Mechanisms</strong></td>
<td></td>
</tr>
<tr>
<td>40MB Internal</td>
<td>374</td>
</tr>
<tr>
<td>40MB External</td>
<td>470</td>
</tr>
<tr>
<td>60MB Internal</td>
<td>580</td>
</tr>
<tr>
<td>60MB External</td>
<td>680</td>
</tr>
<tr>
<td>100MB Internal</td>
<td>685</td>
</tr>
<tr>
<td>105MB External</td>
<td>750</td>
</tr>
<tr>
<td>45MB Removable</td>
<td>699</td>
</tr>
<tr>
<td><strong>La Cie</strong></td>
<td></td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>629</td>
</tr>
<tr>
<td>40MB External</td>
<td>829</td>
</tr>
<tr>
<td>60MB External</td>
<td>929</td>
</tr>
<tr>
<td>105MB External</td>
<td>1029</td>
</tr>
<tr>
<td>120MB External</td>
<td>1229</td>
</tr>
<tr>
<td>210MB External</td>
<td>1329</td>
</tr>
<tr>
<td><strong>Microtech</strong></td>
<td></td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>349</td>
</tr>
<tr>
<td>40MB External</td>
<td>420</td>
</tr>
<tr>
<td>80MB External</td>
<td>560</td>
</tr>
<tr>
<td>100MB External</td>
<td>685</td>
</tr>
<tr>
<td>45MB Removable</td>
<td>589</td>
</tr>
<tr>
<td><strong>PLI</strong></td>
<td></td>
</tr>
<tr>
<td>Sony Mechanisms</td>
<td>698</td>
</tr>
<tr>
<td>Turbo 40MB External</td>
<td>698</td>
</tr>
<tr>
<td><strong>Turbo</strong></td>
<td></td>
</tr>
<tr>
<td>250MB External</td>
<td>1725</td>
</tr>
<tr>
<td>300MB External</td>
<td>1975</td>
</tr>
<tr>
<td>600MB External</td>
<td>2850</td>
</tr>
<tr>
<td><strong>Video Mechanisms</strong></td>
<td></td>
</tr>
<tr>
<td>Infinity 40 Turbo</td>
<td>825</td>
</tr>
<tr>
<td>40-400MB Removable</td>
<td>1550</td>
</tr>
<tr>
<td>Case for Removable</td>
<td>60</td>
</tr>
<tr>
<td><strong>Rodime</strong></td>
<td></td>
</tr>
<tr>
<td>Sony Mechanisms</td>
<td>368</td>
</tr>
<tr>
<td>25MB External</td>
<td>498</td>
</tr>
<tr>
<td>45MB External</td>
<td>498</td>
</tr>
<tr>
<td><strong>Komp's</strong></td>
<td></td>
</tr>
<tr>
<td>Sony Mechanisms</td>
<td>685</td>
</tr>
<tr>
<td>45MB External</td>
<td>555</td>
</tr>
<tr>
<td>70MB External</td>
<td>955</td>
</tr>
<tr>
<td>70MB Internal</td>
<td>763</td>
</tr>
<tr>
<td>100MB External</td>
<td>1010</td>
</tr>
<tr>
<td>100MB Internal</td>
<td>907</td>
</tr>
<tr>
<td>210MB External</td>
<td>1540</td>
</tr>
<tr>
<td>210MB Internal</td>
<td>1460</td>
</tr>
<tr>
<td>330MB External</td>
<td>2290</td>
</tr>
<tr>
<td>330MB Internal</td>
<td>2075</td>
</tr>
<tr>
<td>650MB External</td>
<td>3250</td>
</tr>
<tr>
<td><strong>SyQuest</strong></td>
<td></td>
</tr>
<tr>
<td>44MB Cartridge</td>
<td>84</td>
</tr>
</tbody>
</table>

**RODIME**

The Cobra 650e drive has an average access time of 16.5 milliseconds and a disk transfer rate of 150Kbytes, which means accessing data is done at speeds that are at the leading edge of hard disk technology. Cobra 650e drives incorporate 45K of look-ahead crash caching buffer for even faster access to your data. With caching, the disk drive anticipates the next data the user will need and makes it readily available in "instant access" RAM. The Cobra 650e drives come in a sleek cabinet designed to fit neatly near your Mac while conserving desk space. The Cobra 650e includes Rodime Systems sophisticated utilities software package. Features like true SGS partitioning and UAL certification meet the needs of most power users who require top performance and flexibility.

Cobra 650e Hard Drive ........ $3250.

**Cutting Edge**

Cutting Edge Drive............ See line listings

**CD DRIVES**

**CD Technology**
Porta Drive CD ROM .......... 648

**NEC**
CD-35 Port CD ROM .......... 458
CD-ROM-35 Battery Pack .... 58

**PLI**
CD ROM Drive ................ 875
600MB Optical Drive ....... 3794
600MB Optical Cartridge ... 235

**Toshiba**
CD-ROM XM-3001 ............ 895

**FLOPPY DRIVES**

**Applied Engineering**
800K Floppy Drive .......... 195
1.44MB Floppy Drive ....... 225

**Dayna Communications**
DaynaFile 360K 5.25" ........ 475
DaynaFile 1.44MB 3.5" .. 595

**DaynaDrive**
DOS Floppy Drive .......... 525
360K/1.2MB 5.25" .......... 725
360K/1.44MB 5.25/5.25" ... 745
1.2MB/1.44MB 8.5/8.5/3.5" 850

**DOS Mounter**
1.44MB Drive Mounter..... 53

**DaynaTranslation Software**
87

**Fujitsu**
800K Platinum Color ...... 145
800K Beige Color ......... 145

**PLI**
TurboFloppy 1.4 Drive .... 355
Super Floppy Drive ....... 450
DOS Floppy Drive ....... 525

**TAPE DRIVES**

**Everex Systems**
EMAC 8ST ................ 658
EMAC 150T .......... 950

**PLI**
DAT Backup System .... 2875

---

**Great Storage Values from the MacZone!**

Call us first for low prices

1-800-248-0800

Corporate Accounts: 1-800-248-9948 Intl: (206) 883-3088 Canada: 800-248-0344 FAX (206) 881-3421

Where savings are huge and advice is free. Why buy anywhere else?
### Fonts & Clip Art

**Art**
- 3g Graphics - Images w/Impact
- Accents & Borders
- Business
- Graphics & Symbols
- Adobe
- ATM Plus Pack
- TypeSet I & II
- TypeSet III
- SmartArt
- Adobe PostScript Fonts
  - The Mac Zone stocks the entire line of Adobe fonts from Palatino to Bembo. Call for everyday low prices.

**Bitsstream Inc.**
- MacFontware
- Accents & Borders
- Typeset I or II
- Vol 1 - 9
- Vol 1 - 8
- Accents & Borders
- Typeset I or II
- Vol 1 - 9

### Multimedia

**Aapps Corporation**
- DigVideo B&W
- DigVideo Color
- MicroTV
- Bright Star
- DigVision
- Digital Eyes Color
- Computer Eyes-B/W
- Farallon
- Multimedia Pack
- Multimedia Pack CD

**MacroMind**
- MacMind Accelerator
- MacroMind Director 2.0
- MacroMind Director 3.0

**Orange Micro**
- Personal Vision
- Omni Converter

### Drafting & CAD

**Abracadata**
- Design Your Own Home
- Architecture, Interiors & Landscape

### Entertainment

#### Access Software
- Word Class Leader Board

**Accolade**
- Full & Inches
- Fast Break
- Grand Prix Circuit
- Hardball
- Main 18
- Jack Nicklaus' Greatest 18

**Activation**
- Cosmic Omos
- Mammal

**Addison Wesley**
- The Hobbit
- Fellowship of The Ring
- The Shadow of the Mentor
- The Crack of Doom

**Broderbund**
- Ancient Art of War
- Ancient Art of War at Sea
- PlayMaker Football
- Shufflepuick Café
- SimCity 1.1
- Star Wars
- The Playroom
- Where in the World is Carmen Sandiego?
- Where in Europe
- Where in the U.S.A.
- Where in Time

**Bullseye Software**
- Ferrari Grand Prix
- P-51 Mustang Flight Sim

**California Dreams**
- Blackout (B&W)
- Cassidy & Greene
- Crystal Quest 2.2
- w/Crissle Editor
- Mission Starlight
- Sky Shadow

**Centron**
- Casino Master B & W
- Casino Master Color

**Cinemaware**
- 3 in Three
- Electronic Arts
- Bard's Tale
- Chuck Yeager's A.F.T.
- Weaver Baseball

**Entertainment**
- Fellowship of The Ring
- Arthur: Quest for Excalibur

### Consistent low pricing and availability!

**The Mac Zone**
- Established 1986

**KeyPlan**
- Put your Mac SE into the Ultimate SE Case, and you can take it anywhere. This premium-quality case pampers and protects your SE with its half-inch high-density foam padding. The sturdy Du Pont Cordura nylon exterior looks great, and keeps the weight down.

**Ultimate SE Case**
- $78

**Mac86**
- $434

**S.A.M. 2.0**
- $63

---

**MacZone VALUE PACK:**
- Guaranteed Product Availability
- $39-60 Day Money Back Guarantee on Most Products
- Low Prices
- Knowledgeable MacZone Advisor
Flash

Switchboard

Dotsdesk

SNA

Stylist

Vertical Solutions

Label

Switchboard

MacSpeed

MacTracADB...$70. MacTrac512+...$60.

Flash Page 2 of 8

\[\text{Switchboard} \ldots \ldOTS...
EarthQuest

Established 1996
Software Discoveries
Put graphics and color in your reports anywhere you need them; store pictures in your data base; print text or graphics in any color or ImageWriter II. If using text fields, this is the data manager you can run to.

You don't even have to specify text field length and your field can run to multiple pages.

Record Holder Plus .......... $65.

EarthQuest .............. $51.

Baseline Publishing

MacPAKs are designed to deliver high value software programs for the Apple Macintosh at significantly lower prices. The MacPAK series provides utilities, tools for productivity, personal finance, entertainment and much more! The line includes INIT Manager, Talking Mouse, MacCheese 1.0, Worksheet and APB Express.

MacPAKs ........................ See line listings

MacZone VALUE PACK:

- Guaranteed Product Availability
- $3 Overnight Delivery
- Free UPS Ground Shipping
- 30-60 Day Money Back Guarantee on Most Products
- Low Prices
- Knowledgeable MacZone Advisor

Order Toll Free 1-800-248-0800

Three Sixty

Sand of Fire .......... 32
Armor Alley .......... 33
Harpson .......... 40

Toyogo, Inc.

Nemesis Go Master .... 46
Nemesis Jossel Genius ... 26
Nemesis Tactical Wizard ... 34
Nemesis Deluxe (All Three) . 87

Virgin Masterstrokes

Scribble .......... 23

Visionary Software

Synchronicity .......... 38

XDR Corporation

Mac Ski .......... 37
Lunar Rescue .......... 32
Mac Racquetball .......... 32
MacCourses .......... 16
MacTennis .......... 33
MacSoft Classic ......... 51
NFL Challenge .......... 53
Pre Challenge .......... 56
Road Race .............. 26
TaskMaker .......... 26

EDUCATION

Addison Wesley

Map Programming Primer .... 21
Map Programming Secrets .... 16
Programmers Online

Comparison 2.1 ........ 35

Bantam Books

Illustrator 88 Handbook .... 22
Mastering Wing ....... 17
HyperCard Handbook .... 71

Bible Research

The Word - KJV, RSV, NKJV, NVY ea 148

Bright Star

Alphabet Blocks .... 29
Taking Titles .......... 26

Broderead

Calculus .......... 57
Geometry .......... 57
Physics .......... 57
Type .......... 17

Carina

Yager 1.2 .......... 88

Davidson & Associates

Math Blaster .......... 27
Math Blaster - Mystery .... 29
Sped Read .......... 27

First Byte

The Discovery/Discovery Kit .... 25
Kid Talk .......... 33
Math Talk .......... 33
Math Talk Fractions .... 26
Spell-A-Saurus .... 30
The Puzzle Story Book .... 26

Goldstein & Blair

Macintosh Bible 3rd Ed. .... SS

Great Wave

KidsMath .......... 25
KidsTime .......... 25
NumberMaze ....... 35

Hypergiat

Russian

Introduction .......... 28
Word Torture 3.0 .... 28
Verbal Aspect - Inter .... 44
Word Search .......... 14
Wordsearch Tutor .......... 41
Pronunciation Tutor .... 34

Languages

French

Word Torture 3.0 .... 28
Pronunciation Tutor .... 34
Verb or Tense Tutor .... 41

Italian

Word Torture 3.0 .... 28
Pronunciation Tutor .... 34
Verb Tutor .... 41

Japanese

Kid/Man .... 165
EasyKana ........ 87

Individual Software

Training for PageMaker 4.0 ..... 34
Typing Encore 3.5 .... 39

Learning Company

Math Rabbit .......... 30
Reader Rabbit 2.0 .... 32

Nordic Software

Works Series

Body, Coin, Clock, Earth, & Flashwork .... ea 22
Lemonade Stand .... 22
Alphabetizer .... 22
MacKids Preschool Pack .... 34
PreSchool Disk 1 & 2 .... 22
Turbo Math Facts .... 22
Word Quest .......... 29
Word Search .......... 29

Penton Overseas -

VocalElearn

French, German, Italian, Spanish. Level 1 or 2 ea 35

Personal Training Systems

MacZone carries the complete line of PTS programs.

Personal Training for —

Illustrator ..... 51
Freehand 51
FilmMaker 51
HyperCard 51
Perspection 2.0 .... 51
Microsoft Works 51
PageMaker 4.0 .... 51
Microsoft Word 4.0 .... 51
Microsoft Excel 2.2 .... 51
Macintosh 51

Simon & Schuster

Tutoring Tuts 4.0 .... 28
Software Toolkits

Mac Beacon Taching Typing 31
Accu-Weather 53
World Atlas .... 40

True BASIC, Inc.

Algibra 39
Arithmetic 39
Calculus 39
Discrete Mathematics 39
Pre-Calculus/Ti83 39
Probability Theory 39
True STAT 39

Compu Packs w/Workbook

Algebra Combo Pack 44
Calculus Combo Pack 44
Pre-Calculus/Trig Pack 44

Visual Software

Lifeguard .... 45

Music

Ars Nova

Practica Musica .... 68
Bogos Productions

Super Studio Session 2.0 .... 64
Broderead

Jam Session .... 28

Due to advance print deadlines, prices may vary. Call for most current prices.
recyclable packing material! No more styrofoam!!

The Mac Zone
Established 1986

Electronic Arts
"A pioneering mission: To seek out strange new worlds, new civilizations, and to boldly go where no one has gone before!" Starflight captures all the best elements of classic space opera. Explore the galaxy while you try to save Planet Arth from total destruction! Captain, your starship awaits!

Starflight ............... $39.

In-House Accountant
In-House Accountant is a program that looks at accounting from a single business owner. It has all the best elements of classic space opera. Explore the galaxy while you try to save Planet Arth from total destruction! Captain, your starship awaits!

In-House Accountant ............... $135.

Coda
Female 2.0 1 ............... 558
Mac Drums ................ 30
MusicPro .................. 186
Perceive .................. 49

Electronic Arts
Deluxe Music Const. Set ...... 83

Great Wave Software
Concerto + MIDI 5.0 ........ 97

Mark of The Unicorn
Professional Composer 375
Professional Performer 375

Passport Designs
MasterTrak Pro 4.0 ........ 355
MIDI Interface 15
MIDI Transport 275
Note Writer II 320
Sound Exciter 48

PG Music
Band-in-a-Box ............... 57

Primera Software
Different Drummer .......... 53

Tactic Software
Sound Clips 1-4 ........... ea. 44

Coda
Female 2.0 1 ............... 558
Mac Drums ................ 30
MusicPro .................. 186
Perceive .................. 49

Electronic Arts
Deluxe Music Const. Set ...... 83

Great Wave Software
Concerto + MIDI 5.0 ........ 97

Mark of The Unicorn
Professional Composer 375
Professional Performer 375

Passport Designs
MasterTrak Pro 4.0 ........ 355
MIDI Interface 15
MIDI Transport 275
Note Writer II 320
Sound Exciter 48

PG Music
Band-in-a-Box ............... 57

Primera Software
Different Drummer .......... 53

Tactic Software
Sound Clips 1-4 ........... ea. 44

Hyperpress Publishing
Script Library ............... 56
Script Expert ............... 44
ICON Factory ............... 44

Icon Simulations
Hyper VTH 2.8.4 ........... 56

Individual Software
Individual Power Macros for Hypercard ........ 34.

MicroMind
MacroMind CD ROM ........... 142

Microsoft
Office CD ROM ............... 598

Silicon Beach Software
Super Card 1.5 ............... 195

Softstream International INC
Authentica and Multipla 2.05
Hyper Hit 1 ............... 118
Hyper Hit 1 Relational ...... 268

Somak
Script Editor ............... 43

Spinmaker
Spinmaker Plus 2.0 ........ 114

Symmetry
HyperDIA 1.2 ............... 44

Trendware
Teal ......................... 70

Wayzata Technologies
Quickstart 174
Seals in the US Gov't 55
All of Mac Tutor 160
Disc Trax 80
The USA Factsheet 80
The CIA Factsheet 80
Baseball Guide & Register 160
Vietnam Remembered 80
GEM · Public Domain 75

ACCELERATORS & UPGRADE BOARDS

Applied Engineering
Quadrallink ............... 204
Ram Portable 1MB ........... 530
Ram Portable 1MB SIMM 330

Connectix
Virtual-Mac II ............... 124
Virtual-Mac II w/PMU 187
Virtual-SE/30, IIX 112

DayStar Digital
PowerGache II ................ 4030 40MHz w/FPU 995
30MHz w/FP7U 1225
30MHz w/FP7U 1750
Fast Cache II ............... 280

PowerCard 30 25MHz
II, IIX ........ 1,058
IICX ........ 1,176

PowerCard 30 33MHz
II, IIX ................ 1,465
IICX ................ 1,525

PowerCard 30 40MHz
II, IIX ........………… 1,825
IICX ........………… 1,925

PowerCard 50 40MHz
II, IIX ................ 2,125
IICX ................ 2,225

PowerCard 50 50MHz
SCSI Accelerator + w/ SIMMS SCSI PowerCard 1025
RAM Expansion + w/ SIMMS RAM PowerCard 625

Dave
MacSnap Upgrades ............ 558
Marathon 30 Upgrade ....... 558
Mac Plus, SE, II ........... 525
Marathon Racer ............. 148

Hyperpress Publishing
Script Library ............... 56
Script Expert ............... 44
ICON Factory ............... 44

Icon Simulations
Hyper VTH 2.8.4 ........... 56

Individual Software
Individual Power Macros for Hypercard ........ 34.

MicroMind
MacroMind CD ROM ........... 142

Microsoft
Office CD ROM ............... 598

Silicon Beach Software
Super Card 1.5 ............... 195

Softstream International INC
Authentica and Multipla 2.05
Hyper Hit 1 ............... 118
Hyper Hit 1 Relational ...... 268

Somak
Script Editor ............... 43

Spinmaker
Spinmaker Plus 2.0 ........ 114

Symmetry
HyperDIA 1.2 ............... 44

Trendware
Teal ......................... 70

Wayzata Technologies
Quickstart 174
Seals in the US Gov't 55
All of Mac Tutor 160
Disc Trax 80
The USA Factsheet 80
The CIA Factsheet 80
Baseball Guide & Register 160
Vietnam Remembered 80
GEM · Public Domain 75

ACCELERATORS & UPGRADE BOARDS

Applied Engineering
Quadrallink ............... 204
Ram Portable 1MB ........... 530
Ram Portable 1MB SIMM 330

Connectix
Virtual-Mac II ............... 124
Virtual-Mac II w/PMU 187
Virtual-SE/30, IIX 112

DayStar Digital
PowerGache II ................ 4030 40MHz w/FPU 995
30MHz w/FP7U 1225
30MHz w/FP7U 1750
Fast Cache II ............... 280

PowerCard 30 25MHz
II, IIX ........ 1,058
IICX ........ 1,176

PowerCard 30 33MHz
II, IIX ................ 1,465
IICX ................ 1,525

PowerCard 30 40MHz
II, IIX ................ 1,825
IICX ................ 1,925

PowerCard 50 40MHz
II, IIX ................ 2,125
IICX ................ 2,225

PowerCard 50 50MHz
SCSI Accelerator + w/ SIMMS SCSI PowerCard 1025
RAM Expansion + w/ SIMMS RAM PowerCard 625

Dave
MacSnap Upgrades ............ 558
Marathon 30 Upgrade ....... 558
Mac Plus, SE, II ........... 525
Marathon Racer ............. 148

Micron
IIC-128 (cache card) ....... 345
Motorola-Math Coprocessors
68681 - 16MHz ............... 215
68681 - 25MHz ............... 345
68682 - 16MHz ............... 159
68682 - 25MHz ............... 299
68682 - 33MHz ............... 275
68682 - 40MHz ............... 748

Orange Micro
Mac 286 3.0 ............... 1,078
Mac 802.8 ................... 444
Orange Micro 286 ........... 1,395
Orange Micro 386 ........... 1,695

Orchid Technology
Mac Spirit II Cache Card .... 200

SIMMs
1Mb BONS per meg 59
1Mb BONS for NTX ea. 75
1Mb BONS for IX qty 4 338
4mb BONS for IX 020, 030
Mac qty 4 1,388
4mb SIMM packages come with free NanoDisk software.

Total Systems
Gemini 68000 Accelerators
16MHz w/o FPU 775
16MHz w/FPU 995
20MHz w/o FPU 850
20MHz w/FPU 995
25MHz w/o FPU 1,025
25MHz w/FPU 1,275
Gemini II 60320 Accelerators
33MHz FPU 1,575
40MHz w/FPU 1,850
50MHz w/FPU 2,175
Voyager 68000 for Mac II & IX
33MHz FPU 1,575
50MHz w/FPU 3,365
Gem III (Required to install the Gemini II or Mercury board on the Macintosh, see 5E model) includes internal fan, SCSI port, Specify US or Int. version) .125

MODEMS & FAX

Ablation
InterFax 12/48 ............... 261
InterFax 24/96 ............... 386
InterFax 24/96-220V ....... 386

Applied Engineering
2400 NNP S-EXD ....... 115
2400 NNP S INT ........... 250
2400 NNP S Send FAX Ext. 225
2400 NNP S Send FAX INT. 275
2400 NNP S Send FAX Mac Portable .... 215

Compuserve
Membership Kit ............... 22
Navigator 3.0 ............... 46

Dove
DoveFax 24/96 ............... 278
DoveFax Plus ............... 395

Everal
EMAC MED2400 NNP 5 .... 175
Second Sight ............... 85
White Knight ............... 80

Hayes
SmartCom II 3.11 ............. 84

MacZone VALUE PACK:
- Guaranteed Product Availability
- $3 Overnight Delivery
- Free UPS Ground Shipping

MacZone page 6 of 8

Order Toll Free
1-800-248-0800
Microcom
MacModem v.32 MNP 9...675.

Orchid Technology
Orchid Fax Modem......434.

Preferred Publishers
Double Talk twin pack...115.

Prometheus
Motomove comes with cables & Macknowledge
Macknowledge...84.
MacFax 24/66...295.
MacFax 9600...750.
FAX Modem Portable Int...204.
Product 2400 Mini...118.
2400 SE Int. (MNPS)...245.
2400 Li Int. (MNFS)...259.
9600 V.32...790.

Shiva Corporation
NetModem V2400...428.
NetModem 900V32...1,148.

Software Ventures
Micromove II 3.0...214.

Solutions
BackFax...138.
FAX Gate Plus 1.1...238.
MailMaker 5 User Pack...116.

Supra Corp
Supra 2400...118.
Supra 2400 MacPac...178.

Synergy Software
Versa Term 4...87.
Versa Term Pro 3.0...179.

Telebit
T-2000 19,000 bps...995.
T-2000 V.42 Pei 0.01...1,050.

U.S. Robotics
Courier HST 900 Std...690.
Courier HST Dual Std...950.

All Networking & Connectivity

Asante
MacCon II & ET...340.
MacCon II ET 64K...375.
MacCon SE/30 & ET...340.
MacCon SE/30 64K...375.

Cayman Systems
Gator Box...1,095.
Gator Share Software...1,075.
Gator Card E/L...ea. 431.
Gator Mail O (10 user)...675.
Gator Mail O (up to 200)...525.
Gator Mail M (10 user)...675.
Gator Mail M (up to 200)...525.

CE Software
InOut (1 user)...127.
InOut (11-15 users)...166.
QuickMail 2.2...221.
1-5 users...214.
1-10 users...314.
1-50 users...1,578.

DataViz
MacLink Plus PC...4.5...116.
MacLink Translators...97.

Dayna Communications
EtherPrint...300.
DayaPort E/S/E II & 000...355.
DayaNet/4L...365.
Buzz...1,275.
XL...2,560.
BLE...1,560.
XLE...2,560.
Speed guard collision filter...52.

Dyna Talk for Macintosh
Single...95.
5 Pack...380.
10 Pack...715.

DayStar Digital
Local Talk Board
LT 200 MC...295.
LT 200 CP...185.

Fasline
Local Tap
PhoneNET DIN-8...31.
PhoneNET DIN-8 (10 Pk)...198.
PhoneNET DB-9...31.
Star Connector (single)...17.
Star Connector (10 Pk)...1,125.
Star Controller 300...634.
Repeater...315.
PhoneNet/AppTalk Adap...8.
Ethernet - PhoneNET cards include Timbuktu & RJ45 cable
PhoneNET EN Mac II...350.
Mac II Card (10 Pk)...3,375.
PhoneNET EN 5S/SS...350.
SDCard (10 Pk)...3,375.
Star Connector EN...1,585.
Star Controller EN...1,585.
Star Wiring Kit
Star Controller LT EN...62.
Passive Star...62.
Harmonica Block LT...62.
Network Management Software - PhoneNET Managers PK...725.
PhoneNET - Liason 3.0...275.
Timbuktu - One copy is required on every Mac
Timbuktu single user...92.
Timbuktu 30 user pack...1,234.
Gold Plan 100+ users...2,468.
Timbuktu Remote...122.
Remote Access Pack...485.
Remote Wakeup Cable...31.
Portable Pack...328.
DiskPaper...88.
Mac Recorder
Sound System 2.0...1,585.
Voice Dialer...1,000.

Insignia Solutions
SoftPC...241.
SoftPC Portable...244.
SoftPC E/V/V...61.
Access PC...61.

Kinetix
EtherPort...469.
EtherPort Lattice Net...469.

Microcom Software
Carbon Copy Mac...116.
Twispack...168.

Kovalev
Navico Link II...271.
Navico Link SC...392.
Turbo Bridge...318.
Turbo Net - DB-9...22.
Turbo Net - DIN...22.
Net Pack 12 DIN...198.
Turbo Net ST - DB-9...30.
Turbo Net ST - DIN...30.
Net Pack ST DIN...220.
Turbo Star...1,075.
Turbo Net to AppleTalk adapt...6.

Orange Micro
Grappler
Mac to 512k Mac cable...26.
9 pin...78.
Sporner...46.
Mac LS...68.
Mac LX...127.
Grappler Plus...70.

Shiva Corporation
EtherGate...1,917.
NetBridge...338.

NTS
724.
TeleBridge...338.
Fast Path IV...1,895.

SuperMac Technology
Network Disk Kit...224.

TOPS
TOPS DOS Ver...1.1...117.
TOPS 3.0 Network
Mac...178.
PC...1,975.
PC...1,495.
Flash Card (DOS)...195.
Flash Card Micro Channel...195.
TOPS FlashBox
(Mac DB-9)...118.
(Mac DIN-4)...117.
TOPS Repeater...118.
TOPS Teleconnector...21.
TOPS NetPrint...1,118.

Traveling Software
Lap Link Mac III
Connectivity Pack...115.
Network Pack...175.

INPUT & OUTPUT DEVICES

Ablatom Technology Corp.
Pro Point ADB...79.
Advanced Gravis
MouseStick...64.
MouseStick (ADB)...78.
Altra
Felix...116.
Datadex
Mac 101 Keyboard...126.
Switchboard...168.
Kensington Microwave
Turbo Mouse...105.
Turbo Mouse ADB...107.

Keytronics Keyboard
Mac Pro KB-105 ADB...117.
Kraft
QuickStick (512k Plus)...39.
QuickStick ADB...49.
Kerta - Is/AD/T Tablets
Cordless 4 Button Cursor...64.
8” x 11”...254.
12” x 17”...384.
12” x 17”...624.

Legtech
Scan Man 32...316.

MicroSpeed
MacTRAC ADB...70.
MacTRAC 512+...60.

Microtek - Scanners
3006S...1,375.
3002S...1,975.

Microtouch
UnMouse...185.

MSC Technologies
Little Mouse A+ 512k Plus...69.
Little Mouse A+ ADB...74.

Olduvai Software
Read II - Personal 2.1...138.
Read II - CDR 2.1...275.

Optronics
Bt Pid 12 X 15...315.

The Complete PC
Hall Page Scanner/400...294.
Full Page Scanner...757.

Thunderware
Lightning Scan 400...833.
ThunderScan Plus...184.
MacIchi Power Supply...42.
VIDEO BOARDS & MONITORS

- Micro - Color Cards
- Bit Mac II or SE/30 for 13 or 208 (II, llx, llcx, llci) ......... 379.
- 208 24 bit Upgrade ........ 280.
- 264 (SE/30 • 13') .............. 14.
- Monitor ....................... 345.
- Anti-glare screen • specify
- Monitor ....................... 555.

ACCESSORIES

- American Power Conversion
- UPS 1105E .................. 208.
- Avery Labels
- Mac Label Pro ............... 48.
- The Mac Zone carries a large
- selection of Avery label
- products. Call for the product
- that fits your needs.
- Casio
- Casio B.D.S.S. .............. 219.
- CasioLink/Mac ................ 98.
- CoStar
- LabelWriter ................... 155.
- LabelWriter Labels (2pk) ... 11.
- LabelWriter Labels (Red) ... 62.
- Organizer ..................... 195.
- Organizer Jr. ................. 68.
- Equator
- Mouse Cleaner .............. 68.
- i/o Designs
- MacSleuth ................... 85.
- MacSleuth II ................. 106.
- MacPillow .................... 59.
- Magic Software
- Bookcase ..................... 59.
- MacShake .................... 68.
- MacDek ....................... 68.
- iMac Software
- Clickshield ................... 45.
- Calculator Stat. Set. ........ 44.
- Menu Fonts 3.0 ............. 28.
- Fifth Generation
- Disk Lock 2.0 ............... 117.
- Fast Back II .................. 33.
- Powerstation 2.5 ............ 33.
- Print On 4.0 ................. 24.
- Surface II ........ 48.
- SuperSquel 3.0 ............... 57.
- SuperLaserSquel 2.00 ....... 20.
- single User ........... 85.
- 5 pack .................. 285.
- Hyperpress Publishing
- Stop Ahead .................. 56.
- ODM Simulations
- Mac Kern .................... 58.
- On Cue 1.3 ................. 34.
- Insight Development
- MacPrint 1.2 ............... 88.
- Kent Marsh
- MacSafe II .................. 106.
- Night Watch ................ 84.
- Quick Lock ................... 54.
- MacIvy Software
- Kiwi Finder ................... 64.
- Loop Software
- Picture Book ................ 38.
- Mac Master
- FedIt + ..................... 28.
- Magic Software
- AutoSafe II ................. 23.
- BackMagic ................... 47.
- Power ICONS ................ 37.
- Magna
- Empower II .................. 110.
- Empower II .................. 190.
- Mainstay
- Marco Polo single ........... 151.
- twin pack ............... 257.
- 5 pack ................... 257.
- MarkUp single ............. 127.
- twin pack ............... 257.
- MicroBoard ................. 517.
- M911 Utilities ............... 55.
- Vexta 2.8 .................... 58.
- Micrelitics
- Goler 2.0 .................. 44.
- Microseeds
- I.M.T. Picker 2.0 ........... 35.
- Redux ...................... 48.
- Screen Gens 1.0 ........... 38.
- Rift 1.0 ..................... 48.
- Now Software
- Now Utilities ................ 78.
- Screen Locker ............. 44.
- Olduvai
- Mac II 2.0 ................... 68.
- On Technology
- On Location ................ 74.
- Power Up
- Calendar Creator ........... 34.
- Preferred Publishers
- Personality .................... 47.
- Screen Shot ................ 30.
- Salient
- Disk Doubler 3.0 ........... 44.
- Software
- Mac In Use 3.0 ............ 69.
- Software Innovations
- Hand Off II ................... 51.
- SuperMac Technology
- Disk Fix 1.5 .................. 85.
- Sentinel 2.0 ............... 85.
- Symantech
- S.A.M. 2.0 ................... 63.
- S.O.M. II ................. 90.
- Norton Utilities ........... 83.
- Total Systems
- Quick SANE ................ 45.
- Williams and Macias
- Disk Finder .................. 24.

ACCESSORIES

- American Power Conversion
- UPS 1105E ................. 208.
- Avery Labels
- Mac Label Pro ............... 48.
- The Mac Zone carries a large
- selection of Avery label
- products. Call for the product
- that fits your needs.
- Casio
- Casio B.D.S.S. .............. 219.
- CasioLink/Mac ................ 98.
- CoStar
- LabelWriter ................... 155.
- LabelWriter Labels (2pk) ... 11.
- LabelWriter Labels (Red) ... 62.
- Organizer ..................... 195.
- Organizer Jr. ................. 68.
- Equator
- Mouse Cleaner .............. 68.
- i/o Designs
- MacSleuth ................... 85.
- MacSleuth II ................. 106.
- MacPillow .................... 59.
- Magic Software
- Bookcase ..................... 59.
- MacShake .................... 68.
- iMac Software
- Clickshield ................... 45.
- Calculator Stat. Set. ........ 44.
- Menu Fonts 3.0 ............. 28.
- Fifth Generation
- Disk Lock 2.0 ............... 117.
- Fast Back II .................. 33.
- Powerstation 2.5 ............ 33.
- Print On 4.0 ................. 24.
- Surface II ........ 48.
- SuperSquel 3.0 ............... 57.
- SuperLaserSquel 2.00 ....... 20.
- single User ........... 85.
- 5 pack .................. 285.
- Hyperpress Publishing
- Stop Ahead .................. 56.
- ODM Simulations
- Mac Kern .................... 58.
- On Cue 1.3 ................. 34.
- Insight Development
- MacPrint 1.2 ............... 88.
- Kent Marsh
- MacSafe II .................. 106.
- Night Watch ................ 84.
- Quick Lock ................... 54.
- MacIvy Software
- Kiwi Finder ................... 64.
- Loop Software
- Picture Book ................ 38.
- Mac Master
- FedIt + ..................... 28.
- Magic Software
- AutoSafe II ................. 23.
- BackMagic ................... 47.
- Power ICONS ................ 37.
- Magna
- Empower II .................. 110.
- Empower II .................. 190.
- Mainstay
- Marco Polo single ........... 151.
- twin pack ............... 257.
- 5 pack ................... 257.
- MarkUp single ............. 127.
- twin pack ............... 257.
- MicroBoard ................. 517.
- M911 Utilities ............... 55.
- Vexta 2.8 .................... 58.
- Micrelitics
- Goler 2.0 .................. 44.
- Microseeds
- I.M.T. Picker 2.0 ........... 35.
- Redux ...................... 48.
- Screen Gens 1.0 ........... 38.
- Rift 1.0 ..................... 48.
- Now Software
- Now Utilities ................ 78.
- Screen Locker ............. 44.
- Olduvai
- Mac II 2.0 ................... 68.
- On Technology
- On Location ................ 74.
- Power Up
- Calendar Creator ........... 34.
- Preferred Publishers
- Personality .................... 47.
- Screen Shot ................ 30.
- Salient
- Disk Doubler 3.0 ........... 44.
- Software
- Mac In Use 3.0 ............ 69.
- Software Innovations
- Hand Off II ................... 51.
- SuperMac Technology
- Disk Fix 1.5 .................. 85.
- Sentinel 2.0 ............... 85.
- Symantech
- S.A.M. 2.0 ................... 63.
- S.O.M. II ................. 90.
- Norton Utilities ........... 83.
- Total Systems
- Quick SANE ................ 45.
- Williams and Macias
- Disk Finder .................. 24.

Apple Security Kit ............. 34.
- LaserWriter II Security Kit .... 32.
- A-B Box (56K) ................ 63.
- OneBox-Base ................ 31.
- PowerBaker 360 .............. 269.
- PowerBaker 460 .............. 337.
- PowerBaker 520 .............. 397.
- PowerBaker 800 .............. 746.
- PowerBaker 1200 .............. 946.
- Press Prot ................... 70.
- SideClip ..................... 6.
- Mac Packs - Linebacker
- Navy/Wine or Gray
- ImageWriter Bag .............. 45.
- MacPlus/SE Bag ............. 55.
- Mac SE Bag XI ............... 69.
- Mobius
- Fanny Mac .................. 55.
- P.L. - Carrying Case
- Infinity Turbo 49 Kit ....... 60.
- Smack-a-Mac
- Smack-a-Mac Stuffed Mac .... 8.
- Covers
- SEPlus w/soft. keyboard ...... 17.
- SEPlus w/soft. keyboard ...... 17.
- Apple 13 monitor & ext.
- keyboard ................... 18.
- Targus Bags
- Black or Blue
- Plus/SE Bag ................. 54.
- ImageWriter Bag .............. 45.
- Black, Navy, Gray or Wine
- Deluxe Plus/SE XKB ........ 68.
- Black
- Mac Ix/Ix
- 75.

STORAGE MEDIA

- Fujl Disks
- DS/DD 40k Rainbow ........ 12.
- HD 10pk .................. 20.
- Macell Backup Tapes
- DCD40 40mb Tape .......... 18.
- DD-90A data cartridge for 150
- tape backup ................ 19.
- Sony Disks
- DS 10pk .................. 13.
- Blu 35/50 (50 pk) .......... 39.
- HD (1.44 mb) 10pk ....... 22.
- Blu HD (59 pk) .............. 50.

Established 1986

MacZone VALUE PACK:

- 30-60 Day Money Back Guarantee on Most Products
- Low Prices
- Knowledgeable MacZone Advisor

Due to advance print deadlines, prices may vary. Call for most current prices.

Order Toll Free
1-800-248-0800

MacZone page 8 of 8
**New Correct Grammar 2.0 now checks style too!**

**$99**

Sometimes you get so involved in your writing that mistakes slip by you.

You can catch the wrong spelling with your spelling checker. But other mistakes have been tougher to catch—until now.

Now there's **Correct Grammar** for the Macintosh. It works like your own personal editor to correct mistakes in grammar, style, punctuation, usage...even spelling.

Instantly it identifies inconsistencies, split infinitives, awkward phrases, wordiness, cliches and other fine points of style. Then it suggests how you can correct them.

You can make the correction with a click of the mouse, leave it alone, or rewrite the sentence your own way. If you wish, Correct Grammar will explain the grammatical rule that applies. So you can learn more about good grammar every time you write.

**Guaranteed to catch 95% of your grammatical and spelling mistakes—or your money back!**

Works with all popular word processing programs. System requirements: Macintosh with 1MB of RAM and hard disk. System Version 4.2 or higher.

**Order from your favorite software dealer.**

Or call direct: 1-800-543-3673

**LETTERS**

**C Is for Cylinder**

Having been intimately involved with both hardware and software on mainframes since 1957, I was dismayed when the vacuum tube was put to rest and high-level languages were born. Nonetheless, I continued to feel that I had a pretty good grasp of things—until I saw Figure 1 for the article "The File System" (October '90, page 279), that is.

In my day, a cylinder consisted of all the platters directly under the read/write heads. Thus there would be one or two read/write heads for each platter, not one for each cylinder. We would therefore seek (move the heads) from cylinder to cylinder and endure rotational delay from sector to sector within a track.

Colin Jameson
Alturas, CA

**OOps, as the object-oriented programmers say. Let's just say we weren't firing on all our cylinders that day. —JB**

**Taking Apples to Market**

Why doesn't Apple make more direct comparisons between its products and those from other manufacturers? I see no apparent effort by Apple to refute the rampant and fallacious claims regarding the price/performance ratio of Macs vis-à-vis the DOS/Windows systems. I wish I had a dollar for every article in USA Today, The Wall Street Journal, BusinessWeek, and the rest claiming that Windows now gives the masses the same capabilities as the Macintosh does, for half the price. I'd also like to see Apple provide dealers with training and materials for the purpose of counteracting this perception.

The broadcast media have also jumped onto the Microsoft/Windows bandwagon. I never cease to be astonished at how far they go with outrageous absurdities. A writer appearing on a local TV show was asked which computer companies showed the most promise in the home-computer market. She replied, "IBM and Tandy." When the host asked, "What about Apple?" the "expert" responded, "Not everyone can afford to spend $10,000 for a home computer."

If Apple wants to reach the masses, it needs to put its computers into public places such as restaurants, grocery stores, bars, and shopping centers.

All it takes is imagination.

Hal W. Keeler
Jefferson City, MO

**The Old Gray Flair**

The cover of your October issue is striking! Even the address label fits into the design.

Your carefully planned layout is an inspiring example to desktop publishers that black-and-white (with or without limited color) can be bold, attention-getting, and beautiful at the same time. Thanks for reminding us.

Mary Corman
Livermore, CA

**How to Skin a C•A•T**

I almost completely agree with your review of C•A•T III (see review, October '90, page 83). You criticize the word processor's lack of features, and it is certainly no Microsoft Word. But it has one feature—automatic merging of names, addresses, and so on—that makes it my most-used word processor (I have three). It lets me get a letter out the door minutes after conceiving it. This ability alone leaves my officemate green with envy.

I feel that reviewers ought to rate programs by considering if the built-in functions can be provided by alternatives. For me, so far, nothing compares with C•A•T. It's not my favorite program, but it is my most useful one. The improvements that your review calls for would indeed be welcome.

Donald A. Smith
Coral Gables, FL

**Having read your review of C•A•T III, I found your three-mouse rating to be quite generous. As a C•A•T user from the time version 2.0 was first introduced—still the superior version in my opinion—I've witnessed a steady performance decline in each successive version, culminating in the infuriating, confounding version III.**

The current version is agonizingly slower than earlier ones, which, according to Chang Labs, is because more features have been added, making the program larger but ultimately more versatile. I'll take the speed, thanks.

Also, the manuals are unbelievably awkward and confusing. The authors of these masterpieces must have had a hand in producing the IRS' tax-simplification documentation.

But the claw that broke the kitty's back for me is the new version's inability to access and print database reports that use notes I've been accumulating for almost...
"If you have to worry about money, you might as well be poor."

"Quicken's reports tell me where my money goes and how much I have. Now I'm in control."

"I was making more money. But I wasn't worrying any less. Until I invested $59.95 in a copy of Quicken:
Now I always know exactly where my money went. Exactly how much I have. And exactly what I can afford. I never wake up wondering if a big purchase was a big mistake.
The uncertainty is gone. I've never felt so organized about money.

I'm in control now.
Where did my money go? As I pay my bills, Quicken automatically notes each type of expense — utilities, clothing, charity, whatever. Then a simple click gives me a report showing how much I spent in every expense category each month.

How am I doing? Another click shows my budget vs. actual. Credit application? In seconds I've got a financial statement showing income, expenses, and net worth. Tax time? No sweat. Quicken provides one report with all my itemized deductions.

It's fast.
Time to pay bills? Quicken has "memorized" all my regular payments. I just confirm the amounts and Quicken prints out checks for me to sign. I still use my regular checkbook when it's more convenient. Either way, Quicken instantly keeps my accounts balanced and organized.

It's easy.
Getting started is no problem. There is no set-up involved. No chart of accounts to create. No stacks of old records to enter. I was recording checks in 3 minutes. That simple. Someday I just might read the rest of the manual to see what else Quicken can do.

"Quicken's windows look just like my checkbook. There is nothing new to learn."

It's a powerful business tool.

SPECIFICATIONS
All Macs with 512K RAM. Works with all monitors and printers, including laser printers. Unlimited FREE technical support. Not copy-protected.

Try Quicken for 30 days at no risk.
Are you making more money and enjoying it less? Order Quicken now. You'll quickly see why it's the best selling financial software in the world. But if you're not satisfied for any reason, return it for a full refund. No questions asked.

"There are dozens of Macintosh programs on the market...but few are as elegant, comprehensive and eminently easy to use as Quicken."
— William Harwood, UPI 4/11/89

"Quicken is the best Macintosh tool for helping users manage home budgets or cash flow and do tax record keeping."
— Kim Landis, MacUser 10/31/89

Send in the Coupon, or call 1-800-624-8742
24 hours a day, 7 days a week in the U.S. and Canada.

□ Yes, I'm ready to take control of my finances. Send me the Macintosh version of Quicken for only $59.95. If I'm not completely satisfied, I can return it within 30 days for a full refund. Free shipping by air within the U.S. CA residents add sales tax. For coupon orders, allow 10 working days for delivery in U.S., slightly longer in Canada. International shipping extra.

Name __________________________
Address ________________________
City ____________________________
State ______ Zip ____________
Daytime Phone ( ) ____________

Preferred Payment Method (check one):
□ Check enclosed (no purchase orders or C.O.D., please)
□ VISA □ MasterCard □ American Express

Card No. ______ Exp. Date ________

Signature ______________________

Mail to: Or call:
Intuit
P.O. Box 3014
Menlo Park, CA 94026
1-800-624-8742

For more information about other Intuit programs, call:
1-800-488-8742

Suggested Retail Price $59.95
two years in earlier versions of the pro-
gram! That's like finding out that Excel
2.2 can't print a spreadsheet created in
Excel 2.0! When I called the technical-
support people about this problem, they
recommended I hand-transfer the notes
into the appropriate C•A•T III report
templates. Two years' worth of work?
Ludicrous.
Although I must commend the pro-
grammers at Chang Labs for the im-
provements they made to C•A•T III (bet-
ter word-processing functions, pop-up
menus, and so on), ultimately the pro-
gram fails to deliver the speed, ease of
use, and user-friendly documentation
found in version 2.0.
Sam White
Port Washington, NY

Optical Media Tour

John Rizzo's review of optical disc
drives ("Erasable Optical Drives," No-

tember '90, page 102) contained one

sentence that really caught my eye: "ISO-
compliant Sony, Ricoh, and Maxtor
mechanisms can all read each other's
cartridges."

According to my experience, this
couldn't be further from the truth. I've
spent four months testing various mag-
neto-optical drives from companies in-
cluding Ricoh, Sony, and Maxoptics
(Maxtor). I've found that the Ricoh drive
can read only Mitsubishi and 3M media,

and the Sony and Maxoptics can read

only their own media. I also have media
from PDO and Tosoh, but those can't be
read by any of these three drives, even

though PDO makes the media for
Maxoptics.

Unless some major changes were to
take place, or if you used different media
than I did, the issue of compatibility and
proprietary media will continue to be a
major one.

Sean Ward
Encinitas, CA

It's not the media that are your prob-

lem but the way they're formatted. We
can the same media on Sony, Ricoh,
and Maxoptics drives with good results. Some
vendors whose implementation of the ISO
formatting standard is not up to snuff will
have compatibility problems. Although
the MacnStor (Maxoptics) 650-mega-
byte format follows the spec, the 1-
gigabyte format doesn't follow the stan-
dard at all and is not compatible with
other drives. — JR

Foo's Rush In

I disagree with Scott Forbes' explana-
tion of the origin of the generic term foo
for a function (Letters, October '90, page
21). Obviously, a model function name
should begin with the letter f to signify
that it's a function, and I've always as-
sumed that the nonsense word foo was
chosen as a nod to Bill Homan's comic
strip "Smokey Stover." After all, the word
is always spelled foo, not fu (as in
FUBAR), and I have never seen bar used

Please circle 56 on reader service card.
"Controlling your computer by voice is a science-fiction fantasy that has finally become reality." MacWeek's Bob LeVitus goes on to say:

"**HIGHEST 'WOW' FACTOR OF ANY PERIPHERAL WE'VE SEEN**"

"With Voice Navigator II, your Mac will obey your every command; all you have to do is ask...you can't help being delighted when you see it responding to its master's voice. If that sounds sexy to you, it is." - MacWEEK 10/90

Just say "Open, Close, Print, Zoom, etc..." Voice Navigator II responds as quickly as you speak. Really. It works so well that our technology won MacUser's 'Most Significant Hardware Product of the Year 1989'.

"**WE WERE AMAZED**" - MacUser 3/90

Now imagine PageMaker, Word, Excel, FileMaker, MacDraw, all of your favorite applications running **Up to 50% faster**! So the next time you're next to a Macintosh, be careful what you say- it may be listening!

_for more information call toll free 1-800-443-7077_

---

**MAC USER EDITOR'S CHOICE**

**MOST SIGNIFICANT HARDWARE PRODUCT**

**Video Demo Tape $20 Rebate Offer**

Watch Voice Navigator II demo applications. Only $9.95 includes shipping. As a bonus we include a free $20 rebate certificate!

Call toll free to order VHS video.

In USA 1-800-443-7077

In Europe 41 22 42 96 47

---

**Articulate Systems**

the voice communication company

1999 Articulate Systems Inc. All Rights Reserved. The Articulate Systems logo is a trademark of Articulate Systems, Inc. 91 Erie Street, Cambridge, Mass. 02139

All other trademarks are the property of their respective companies. Advertising Design by Design Group, 707, Palo Alto, CA. Doug Baldwin Photography, Los Angeles.
as a function name (although I have seen goo).
Phil Miller
St. Paul, MN
We would dearly love to reproduce the
"Smokey Stover" cartoon that Mr. Miller
enclosed (which does indeed include the
word too in various locations), but we’re
still smarting from the time we acciden-
tally ran some Calvin and Hobbes icons.
Interested readers are referred to page
286 of Great Comics, which was edited
by Herb Galevitz (Crown Publishing).
—JB

Fuzzy Logic
What marvelous technological
breakthrough brought us the fine quality
of the little pictures of your columnists
(November ’90)? Did you have them lie
down on a scanner and modem the result
back to the office?
Daniel A. Koblish
Redondo Beach, CA
The technical term for the process is
FUBAR. —JB

Tech’ed Off
I read with interest Thom Hogan’s
“How to Get Tech Support” column
(November ’90, page 253). I have often
been the victim of software companies
that brag about their great on-line technical
help that turns out to be technical
“nonhelp.”
Write letters, Hogan recommends. To
be sure, I have written letters to address
software problems — as many software
companies would be willing to attest.
Usually, however, even these do not help
until the last paragraph, where I state that
my next step is to communicate these
software problems to all Mac users by
addressing letters of criticism to all Mac-
oriented publications.
As for the “technical” manuals pro-
vided with most software, almost all of
them are unintelligible, because they’re
apparently written by individuals who
have absolutely no interest in communi-
cating information.
Perhaps Hogan would consider writ-
ing an essay that would be directed to all
the technicians who work in his commu-
nity. In it he could suggest methods that
they could employ to provide the technical
assistance that users need. Then the
users will cease to be the victims in this
situation!
J. Michael Yeager
Waterford, CT

Weenie Beast
In response to John C. Dvorak’s
“Weenie Computers” article (November
’90, page 348), I would say he missed the
point entirely. There is such a thing as a
home computer, and I have had three of
them.
My first “weenie computer” was a
Commodore VIC-20 that I bought in 1982.
It may have had only 3K of available
memory to work with, but it was the most

The Organizer is not only a sturdy pedestal for your laser printer.
It’s an ideal place to store extra paper, paper trays, a hard-disk
font server and toner cartridges. Built-in cable guides neatly
organize your wiring, too.
Which also makes it an ideal place for a scanner, fax machine
or personal copier.
The new Organizer Jr. lets you stow your scanner, fax, copier
or personal laser printer under your desk. Just roll it out when
you need it. Two shelves hold extra paper.
The Organizer and Organizer Jr. come assembled and with a
lifetime warranty.
For the nearest dealer, call 1-800-4-COSTAR or
203-661-9700. Or write CoStar Corp., 22 Bridge
Street, Greenwich, CT 06830 (fax: 203-661-1540).


Please circle 22 on reader service card.
affordable computer you could buy. It offered color graphics, music, sound, and a price you couldn’t beat.

My second and third weenies were the Commodore 64s Dvorak mentioned in his article. Weenie computer — are you kidding?!? This computer had 38K of RAM to work with, which is plenty when you’re programming in BASIC. With it you had complete control of 16-color, high-resolution graphics and a three-voice, eight-octave music synthesizer. All with a price tag that was less than $500.

Now I use a Macintosh. I don’t even own it — it’s too expensive. I use the SE that Dad brought home from work (I’m 14). Now this is a weenie computer if there ever was one. Not that I don’t like it — I love it. But I don’t see how this computer can cost $2,000. And that doesn’t include the hard drive, FDHD, or the keyboard!

Jason Gosnell
Maryville, TN

John C. Dvorak states that the market for home computers has not been established. With this I will agree, but the reason the market has not been established is that sufficient attention hasn’t been given to encouraging and assisting those who would benefit from the use of home computers. A good market survey would find out what home users want.

Too little attention has been given to developing useful programs that would be attractive for those who use home computers. I am referring not only to those who have small home businesses but also to those who are interested in keeping their personal records in order and easily available. Why doesn’t a company include several basic applications on one disk (or include them on a small hard drive)?

Joseph Ringers
Charlottesville, VA

Bundling several basic applications at a bargain price is a good idea, and T/Maker is doing exactly that with its SmartBundle package. For $349, you get WriteNow 2.2, SuperPaint 2.0, RecordHolderPlus 3.1, and Full Impact 1.1. — JB

**Clarifications**

“Clip Artistry” (November ’90, page 168) listed some incorrect addresses and an incorrect price. The correct contact information for Dream Maker Software is 7217 Foothill Blvd., Tujunga, CA 91042; (818) 353-2297.

Dubl-Click’s address is 9316 Deering Avenue, Chatsworth, CA 91311; its phone number is (818) 700-9525.

The correct price for Image Club’s ArtRoom CD-ROM disc is $799.

The second line of code for Example 7 in “14 Excel Solutions” (November ’90, page 233) is missing a character. The correct code is:

```
+SUM (MINUTE (A1 : A3)) / 60
```
ColorPage™ T16 all business display. Full page, full price: $2995!*  

When you've got the world's top rated Mac II display, all you can improve is the price! ColorPage T16 from E-Machines now offers Macintosh business professionals the best for even less — the ultimate combination of compact size and big-screen impact, just judged #1 again by MacUser LABS. You get a whopping 70% more working space than on a 13" Apple. Don't settle for less when now you can afford the productivity of a full page color display. Call 1-800-34-GRAPHIC for your nearest dealer. Or write E-Machines, 9305 SW Gemini Drive, Beaverton, OR 97005.

If you live outside the U.S., call 503-646-6699 for the name of an E-Machines international distributor.  
Copyright © 1990, E-Machines. Macintosh is a trademark of Apple Computer. *Suggested list price for a complete system. Please circle 151 on reader service card.
Of Mice and Menaces

You've probably got your own name for them. We call them the mice, the mouses, the meesees, the whiskered wonders, the waseally wodents. I'm talking about the mouse dingbats that grace every MacUser review, of course. They number anywhere up to five mice in a litter, in increments of half a mouse, depending on how strongly our editors and lab staff recommend a product.

Over the years, we've awarded literally thousands of mice to Mac-product vendors. Whatever you call the little critters, they're undoubtedly the best known vermin in all of computerdom (aside from the legion of actual Mac mice themselves), and we're mighty proud of them.

But sometimes we—as someone once said—hates meeeses to pieces.

For starters, there's the issue of the half mouse: What do you do to graphically show half a mouse? Do you slice it in half—and if so, do you dissect it vertically or horizontally? (To avoid the wrath of dingbat antivivisectionists, we have opted for a one-half fraction instead, although we admire the aplomb of several vendors who have used a variety of shockingly explicit half-mice in their advertisements.)

Then there's the grammar question: Is it a four-mice product or a four-mouser?

I won't even mention the typographic hassles of getting the special mouse character to print—with proper kerning, leading, and wrapping—in our (and our vendors') DTP systems. Ever try to kern a mouse?

Don't forget the aesthetic issue: Do we stick with our more-or-less zoologically correct animal or switch to a representation of a mechanical mouse?

All of these are insignificant compared with the real issue: Is it meaningful and fair to slap a single numerical rating on complex, multifaceted hardware and software products?

It's a question that comes up like clockwork at our editorial-staff meetings. It tends to be triggered by vehement letters and phone calls from vendors or users of products that have recently received a relatively reduced rodent rating.

There's a mathematical truism at work here. In any comparative review of a group of products, 50 percent of the products score in the top half and 50 percent are rated below the median. (Guess which half send the letters and make the phone calls . . .)

It's not that we're shy about calling the shots—it's that we're shooting at a moving target. That target has three concentric circles: the universe of competing products, the capabilities of the Mac itself, and—the bull's-eye—the wants and needs of all our readers.

The Meaning of Mice

As the universe of Mac products expands, our ratings guidelines adapt accordingly. For example, copy-protecting application software used to cost products a full mouse. Today, although copy protection hasn't vanished off the face of the planet, it's generally done in unobtrusive and appropriate ways, so we no longer enforce an automatic “protect the disk and lose a mouse” policy. (As with any feature, however, if the copy-protection scheme is implemented in an awkward way, the product's rating can suffer.)

The passage of time tends to nibble away at mice ratings. Because the state of the art is continually improving, we go through our MiniFinders database of mouse-rated products regularly and downgrade products that haven't kept up with the times—and the competition. When these products are upgraded, the ratings are reviewed once again.

Occasionally we change product ratings because the installed base of Macintosh users (and MacUser readers) is changing. For example, a product whose sole benefit is that it works on a 128K Mac no longer wins Brownie points from our reviewers. (Sympathy and sentimental gratitude, yes, but Brownie points or mice, no.) Likewise, products are no longer rewarded merely for using color or for being fully Mac II-compatible, which was a big deal not so long ago.

See How They Run

The majority of the products we test and review are good, solid, quality products, and the differences in mouse ratings are based on an analysis of how a product fares against the competition. Most products are part of a pool of products aimed at similar users with similar budgets in similar markets.

That's why we've turned to a lab-based testing methodology for the majority of our reviews, particularly in the case of hardware. When the differences are measurable and objective, that review process and the meaning of the mouse ratings are straightforward.

It's no coincidence that more than half the products in our lab reports usually rate higher
than the three-mouse rating you might expect to be the median score. If everybody’s doing their job right, developers are putting their best efforts into the same hot product areas that MacUser Labs is investigating.

When a product mouses poorly, it’s generally for one of two reasons: It’s seriously flawed (or inferior to a comparably priced, similarly designed competitor), or the product is fine for a very, very specific type of user but certain aspects of its design—the interface, the feature set, the hardware requirements, and so on—render it unsuitable for a mass audience.

In other words, lower ratings don’t always mean lower quality. What they often mean is that although a product is nicely suited for some users, it’s the wrong choice for most.

A good review takes into account who will be using the product; the review can’t and shouldn’t be written in a vacuum. For example, in the pre-Mac II days, any product that tried to do heavy number-crunching or anything that required processor-or memory-intensive calculations was crippled by pathetically slow performance, and the tone of many reviews was along these lines: “Nice idea, but just too sophisticated for the Mac.”

With the arrival of the Mac II and beyond, the pendulum swung to the other extreme. An attitude of “Nice idea, but wastes the awesome power of the Mac” infiltrated many reviews. If an app didn’t blow away all your friends with 386s and Windows, it wasn’t worth the time of day. Apple had leapfrogged from making the computer for the rest of us (read: computer illiterates afraid of character-based interfaces who just needed to balance their checkbooks, file their recipes, and doodle new logos in MacPaint) to making the computer for the best of us (read: powerful computer jocks), and our reviews echoed that shift in sensibilities.

With the arrival of the new low-cost CPUs, Apple’s product line finally has all the price points needed to interest both ends of the spectrum—from the under-$1,000 Mac Classic for the casual user to the IIfx workstation that often runs deep into five digits for the power user. That makes it tougher for one mouse rating to cover all possible situations.

Take the categories of graphics software, for example. If you have an IIfx equipped with a color scanner, printer, and monitor, and you’re geared up to do high-end prepress work, you’ve made a substantial investment in hardware that you’re probably prepared to supplement with a reasonable investment in software. And most likely you’re willing to spend some time with the software, learning the ins and outs of several programs, each one optimized for a different step in your process or a different nuance in the result you’re aiming for.

On the other hand, if you’re a graphic artist who’s just picked up a Mac Classic,
Today, over 1.1 million hours will be tracked using Timeslips III. And every one of them will be billed.

It is the supreme irony of modern business. That until now, it has been impractical—and often unprofitable—for a business to treat its people’s time with the same respect automatically accorded its money.

What’s more, it’s a costly shame.

Because for most businesses, time is by far their most valuable resource.

Now you can track time for all it’s worth.

For today’s business, the answer is Timeslips III for the Mac. A complete, sensible, and surprisingly powerful software program that helps accurately track, analyze, and charge-out both time and expenses. And do so with unprecedented facility and speed.

Timeslips III for the Mac has an extensive security system. This option lets a supervisor choose from multiple levels of password security that restrict access to sensitive client information or confidential productivity and financial reports.

Timeslips III has a desk accessory stopwatch to quickly record time and activities in detail. With reporting that’s thorough and flexible. In a variety of formats you determine. And with instant graphing for performance and financial evaluation. It even produces custom invoices in the font of your choice, aging reports, mailing labels, and billing worksheets.

The Bill Layout Tool makes it fast and easy to alter the appearance of your bills. Use your mouse to move or change fields on the billing screen. You can also change fonts, include lines, add boxes and extra text, even import PICT format graphics.

Thanks to Timeslips, many people report up to a 25% increase in accountable time. Which means an equal improvement in productivity and income.

Best of all is that Timeslips III won MACUSER Editor’s Choice Award for Best New Professional Financial Package of 1989.

Get time on your side today.

Timeslips III for the Mac is just $299.95 at your software dealer or from TIMESLIPS Corporation. And ask about our network version which can support up to 255 stations. We also have a free HyperCard™ demonstration disk that shows you how effective Timeslips III can be for your bottom line.

Timeslips III II For the MAC

But don’t wait. Call today. Because Timeslips III on your computer is as good as money in the bank.

Call 1-800-338-5314

© 1990 TIMESLIPS Corporation, 259 Western Avenue, Essex, MA 01929.
SYSTEM REQUIREMENTS: System 6.0.2; Supports MultiFinder. Operates on a Mac Plus or higher with 1 MB of RAM. Hard disk is recommended.
See us at Macworld Expo Booth 1127, at Moscone Center.
hard disk, and printer for well under $2,000 total, the thought of spending more than a few hundred dollars on software is enough to lead you to thoughts of piracy.

Because we can give only one rating, we have to make some assumptions about what kind of hardware you have, what your pet peeves are, what features get you excited, and so on. Our research department does all kinds of surveys and market studies to find out precisely what kind of Mac user reads MacUser. But at the end of the day — and at the end of the review — we have to rely on instinct about who you really are and what you want.

Let’s get back to those two graphic artists. One of them is going to buy an entire library of software — perhaps Photoshop, Illustrator, TypeStyle, Metamorphosis, MacDraw II, PixelPaint Pro, and Swivel 3D, for starters — that’s going to cost more than the other artist’s hardware setup. The other person is looking for one product that does all it (or at least most of it) and doesn’t cost an arm and a leg — an UltraPaint or DeskPaint/DeskDraw. Both users are going to have to read the same reviews, and the same mouse ratings, for each of these products.

Escaping the Mouse Trap

You really need to look beyond the mice to decide which product is best for you. And although we sometimes like to feel that we’re the last word on the subject, we encourage you to check out other sources of information about the products you’re interested in; seek out word of mouth to complement word of mouse.

Read the ads; send in the reader-response card for the vendor’s literature; ask questions on bulletin-board services or at user-group meetings about other people’s experiences; and send for demo disks, or visit your local Mac product dealer for hands-on experience. And read this month’s “Buying Smart” for more tips on how to go beyond a review or a rating to make sure your software and hardware dollars are buying all they can.

But while the mice can’t possibly tell the whole story, they’re a good place to start — once you know what they mean.

A Mouse Manifesto

A five-mouse product belongs on the desktop of virtually every MacUser reader. Five mice means that all users who can imagine a way they’d use that product won’t be disappointed when they make the necessary investment in time and money. A five-mouser is probably worth buying even if you don’t yet know what you’d do with it.

Four and a half mice means that the product suffers from at least one significant flaw or missing feature or that there’s at least one competitor that implements at least one feature better — or costs less.

Four mice means you should seriously consider this product as you evaluate your options. Most four-mousers are
I'm good at desktop publishing. But desktop accounting scared me. The thought of doing bookkeeping for my design studio got me uptight.

When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books. No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar? But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside.

And deadbeats to collect from—only I had no idea who owed us how much or for how long. Some suppliers may have even thought of us as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar

atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home. Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices—and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!—realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

What I didn't know was costing my company

I discovered a key client who hadn't paid in two months. I called and collected and now he wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance sheet I printed out myself—no sweat.

From fear and loathing to passion. Now I even study the management reports atOnce! generates. I'm still an art director. But atOnce! helped me become a better businessman!

A hidden bonus that made my day

When our bookkeeper returned, I showed her atOnce! Now she's back doing the books, even makes sure my plants are green, and I can supervise like a boss should. Putting the books on the Mac gives me the numbers I need when I want them. It lets me take control of income and expenses.

Here's some free advice: Take control of your own business. Buy atOnce!

$395

Peachtree Software
1505 Pavilion Place
Norcross GA 30093
800 247-3224 OR 404-564-5800

SYSTEM REQUIREMENTS: Macintosh Plus or above with at least 1 MB RAM. SYSTEM VERSION 4.2 OR HIGHER. HARD DISK AND UNLOCKED COPY TWEK MAGICALMIND AND UNLOCKED APPLETWEK COMPATIBLE. APPELGARDEN TOPS COMPATIBLE. COPYRIGHT 1989 PEARLINE SOFTWARE, INC. ALL RIGHTS RESERVED. ATONCE IS A REGISTERED TRADEMARK OF PEACHTREE SOFTWARE, INC. MACINTOSH, HYPERCARD, IMAGEWRITER AND ADOBEWARE ARE REGISTERED TRADEMARKS AND APPELGARDEN IS A TRADEMARK OF SUN MICROSYSTEMS, INC.

Please circle 134 on reader service card.
The quick professional way to show who's boss

Org Plus" for Macintosh makes organization charts automatically, with tremendous time savings over draw and presentation programs.

Draw and presentation programs make you do the hard work of sizing boxes and fitting the chart on the page. Org Plus does the hard work automatically!

**Fast chart creation—no drawing required**

Simply select a box tool at the top of the window and click on the chart to add boxes. Org Plus automatically draws and spaces the boxes and precisely lays out the connecting lines. Then type in names, titles, and other information. Org Plus automatically expands or shrinks boxes to fit. Choose from over 50 different chart, box, and line styles to get exactly the look you want.

**Compact charts show lots of information**

You also want your chart to be as compact as possible—preferably on one page. Org Plus makes it easy. Change the arrangement of your chart with a couple mouse clicks. Or, use the unique Make Fit command to apply a number of space saving features automatically. Just tell Org Plus how big you want the chart to be.

**Updating charts is a snap**

Even simple updates can cause a chain reaction that drastically changes the entire chart. For example, merely choosing a larger font may require all boxes to grow in size and change location. Org Plus maintains a uniform box size and even spacing automatically, no matter what changes you make! The time savings are tremendous. Professional appearance is guaranteed.

Easily update charts to keep pace with changing organizations. With a few mouse clicks, you can add, insert, delete, or move boxes—even entire departments. Org Plus does the redrawing for you.

**Personalize, customize your chart**

Add your company logo, type notations anywhere in your chart, or change the way Org Plus draws something. A complete set of drawing tools lets you get any special effects you can't get automatically.

**Order today risk free!**

Org Plus is ideal for companies that use both Apple and IBM hardware. It easily exchanges information with the #1 selling IBM PC organization chart maker, Org Plus Advanced. System Requirements: Macintosh Plus (both 2 and 32k), SE, LC, Classic, and Macintosh II series computers. Requires System v.2 and Finder v.0. MultiFinder compatible. © Copyright 1990 Banner Blue Software Incorporated. All rights reserved. Macintosh is a registered trademark of Apple Computer, Inc.

Please circle 110 on reader service card.

Two mice: Watch out for this product. It may have anything from some severe bugs (bugs and mice are natural enemies), a confusing interface, and poor technical support to an exorbitant price.

One mouse: You may have noticed that *MacUser* doesn't run many reviews of one-mouse products. We'd rather use the space to tell you about products that are worth reading about. But if a one-mouser falls within the scope of a comparative lab report—or if we think it's important to warn you about a product's flaws—you'll see a lone mouse to ward you off.

When a product is beneath contempt even for the *MacUser* rat pack, we award a no-mouse rating. Only a handful of products have ever had a bomb dropped on them throughout *MacUser*'s history.

**Resolutions and Revolutions**

Last month I promised to say more about the revolution taking place in the changing realm of spreadsheets. Which means I've already broken my New Year's resolution not to promise today what I can't deliver until next month. But I did want to share a few other resolutions—ones I hope you'll adopt for yourself.

Resolutions: Let software publishers know you're not impressed when they bulk up their packaging so that a disk and a small manual come in a box that's bigger than a bread box, thanks to all the styrofoam, plastic, and other non-recyclable filler.

Resolutions: Let the mail-order companies that adopt environmentally sound shipping practices know you appreciate their concerns. (After MacConnection announced that it had stopped using styrofoam "peanuts" in its packing materials, Mac's Place announced that it would ship all products in—honest—popcorn.)

Resolutions: Use E-mail instead of paper mail and memos whenever possible. It's faster and easier, and electrons are 100-percent recyclable. Become a pixel pusher instead of a paper pusher.

Resolutions: If you want to write to point out that *MacUser* is a paper product (occasionally shrink-wrapped in plastic) that ought to clean up its own act, do it electronically; post your comments in the Editors On Line section (section 7) in the *MacUser* forum on Zmac. (If you're a CompuServe subscriber, just type GO ZMAC at any ! prompt. If you're not, look for information on how to sign up elsewhere in this issue.)
Let NewGen satisfy your hunger for high-resolution with an affordable 800 dpi printer!

Add powerful applications like PageMaker®, FreeHand® and Adobe® Type Fonts to produce typeset quality output at your own facility.

The NewGen TurboPS/480 can produce PostScript® language compatible output at 800 x 400 dpi, nearly four times the resolution of other laser printers. And when we say PostScript compatible, we mean it, including Type 1 fonts, special effects and EPS files from all your favorite applications and programs.

The NewGen TurboPS/480 is a complete printer with built-in AppleTalk®, parallel and serial ports. And unlike some printers, it works in mixed Mac-PC environments, and it doesn't require an internal PC processing board or dedicated server.

To show you how confident we are that you'll be impressed with 800 x 400 dpi output, we printed this page at actual size, including the menu which was output as color separations.

What does all this resolution and compatibility cost? Very little. The TurboPS/480 — with 800 x 400 dpi and RISC performance — lists for about 25% to 50% less than its competitors, while our TurboPS/400, TurboPS/360 and TurboPS/300 laser printers cost less than slower 300 and 400 dpi PostScript language printers.

If you have an appetite for high-speed, high-resolution PostScript language printing, call 714/641-8900 today to get your TurboPS evaluation kit.

Dealer inquiries welcome.
"There was Pantone 485 everywhere. She wiped a tear.

He didn't want just any colors. No, that wouldn't do. They had to be perfect. Pantone** perfect. His color monitor was a limitation. He knew that. Then along came this thing called Radius. It had colors down cold. The colors he saw on his display were the colors he got. A special Precision-Color™ Calibrator made certain of that. When his proofs got back from the printer, there weren't any surprises. He hated surprises. He hated gunplay, too. Now he had more time for his passion. No, not Brenda. Color.
From Her Big Process Blue. Her Skin Went Pantone 263.

He had a big 19" display and his choice of 8, 16, or 24-bit color. He chose 24. He also went with QuickColor, a graphics engine that allowed his screen to fill and scroll up to six times faster. That was good. It was all good. Except for Brenda’s evil twin. He was gonna fix her, all right. Make her hair gray. Turn her lips purple. He wasn’t sure, but he was gonna get that dame. For your nearest Radius reseller, or for a color systems brochure, call 1-800-227-2795. In Canada, call 1-416-738-3920.
Pull down a shortcut.

"Introducing QuicKeys\textsuperscript{2}.
The newest thing you'd hate to do without."

Before you had these modern shortcuts, you could still do everything you needed to do. It was just harder. Or took longer. You had to wait until Monday for cash. Get up to change channels. Balance your checkbook with pencil, paper and lots of swearing. It's hard to imagine going back.

Tens of thousands of people depend on QuicKeys\textsuperscript{2} as their modem shortcut for the Mac. Reviewers rate it "right up there with sliced bread, the Great Pyramid of Cheops, and others wonders."

"How 'bout a quickie?"

Now there's QuicKeys\textsuperscript{2} — an exponentially more powerful way to automate your Mac. It's the easiest way to speed up the slowest part of your Mac work — the time you spend launching, choosing, selecting, changing, and all the other commands you do over and over every day.

Say you just printed a letter and you need to print an envelope to go with it. Without QuicKeys\textsuperscript{2}, you select the address, copy it, open a new document, hit the return key 15 times, select Paste, select All, change the margin, select Page Setup, click landscape, OK, Print, manual feed, OK and close the document without saving changes — every time. As a QuicKeys Sequence, you just select the address and press a key — instant envelope! It's that simple. Think of all the shortcuts you could create.

"QuicKeys see, QuicKeys do."

Customize your Mac without learning to program. QuicKeys\textsuperscript{2} can watch what you do and record your every move. Have it duplicate your routine exactly, or edit out "unwanted" steps and add additional ones.

You can even instruct your Mac to play QuicKeys at pre-set times. Automatically save every 15 minutes. Pop up your "to do" list once an hour. Launch your backup program at 3:30 Friday. You'll never forget again.

Try QuicKeys\textsuperscript{2}. You'll wonder how you ever did without it.

― September 6, 1990
Call 1-800-523-7638 and ask for Dept. CE28
Suggested U.S. retail price $149.95.
Instability Index

It's hard to believe, but the Mac is seven years old this month. And although today's Macs seem far removed from the lowly 128K Mac of 1984, there are more commonalities than differences. The Mac interface is standing the test of time, so much so that even DOS diehards are looking at GUIs (graphical user interfaces) and Steve Jobs' brazen prediction that the Mac would become the "third standard" after the Apple II and the IBM PC has come true.

Seven years ago, the business marketplace laughed at the Mac, dismissing it as a toy. Only 128K of memory? No hard-disk drive? No expansion capabilities? No SCSI or other bus? When the Mac Plus appeared in 1986, it put a lot of these objections to rest with its 1 megabyte of memory (upgradable to 4 megabytes) and a SCSI bus for hard-disk drives and other expansion hardware. The Mac even got its own built-in network, AppleTalk, and an incredible laser printer that was reason enough for some business users to switch from DOS. Every model introduced since then has further demonstrated the power and flexibility of the Mac architecture.

After seven years of continual improvement and refinement, with more new and exciting changes looming on the horizon, the Mac has finally gained the widespread acceptance as a business computer that this column, for example, has been claiming was its due since 1985. But is the Mac the business machine for everyone? Or is it possible that some applications just weren't meant to go the Macintosh way?

For mainstream business applications, there's little doubt that the Mac is at least as good as any other platform and is in many ways superior. Why else would other machines be aiming GUIs at the Mac in self-defense? For word-processing, spreadsheet, and desktop-publishing applications, the Mac interface is liberating for many people, unleashing their creativity when a mouse is put into their hands. You may have noticed that the major Mac applications are also available for the IBM PC and sold well on both sides. But in the database arena, the Mac has both passed the PC and been left behind. Relational databases such as Double Helix II and 4th Dimension have given Mac business users incredible power, but no single Mac database program has become the driving force that dBASE is on the PC side. Yes, many developers are using Double Helix II, 4D, and other Mac database programs to create custom applications (and some very powerful and attractive ones, at that), but the kind of critical mass that dBASE has achieved on the PC has stayed out of reach.

The consistent Mac interface has also served as a barrier to market entry for many smaller firms that develop vertical-market software. When your expertise is primarily industry-specific and programming is only secondary, facing the Mac can be quite daunting. Programmers who are experienced on other platforms face a significant learning curve when moving to the Mac, because they are responsible for doing all the necessary work to make the product easy to use for the consumer, which is the Macintosh way of doing things. As a result, many companies in specific markets end up with IBM PCs, as the software for their industry is limited (if it's available at all) on the Mac.

Even if the software you need to run your business is available for Macs, there's the stability problem. As fast and hard as Apple works to make the Mac OS (operating system) rock-solid, third-party developers work even faster to make interesting and often powerful changes to the OS. These modifications can make life with the Mac easier or more fun, but almost every one of these changes increases the probability of instability. And when Apple introduces major changes to the OS, such as System 7.0, the stability gap can become a vast chasm.

The one thing users who depend on their Macs to run a business can't tolerate is increased instability. Sometimes it seems as if the Mac is architected for reduced stability. It's not, of course — quite the contrary — but when a system bomb or freeze-up trashes valuable business data — even if it can be retrieved — the pain can be major.

There are strategies you can follow to reduce your vulnerability to instability problems. Although it seems that this column tosses them up every few months, they're worth repeating again and again. Some people have to endure the agony of re-creating a week's worth of transactions before they pay attention to preventive measures, but you don't have to suffer to clean up your act.

Back up your data. Incremental backups, easily accomplished with packages such as Redux or Diskfit, can reduce the onerousness of the task. Even better, archive your data so you have multiple generations of backups.
How MacInTax Plays for You.

Kristin Kozlowski, National Account Manager for a Fortune 500 Company

On organizing her life...
“My job can be demanding, requiring a good deal of travel. There’s precious little time to organize my personal finances. In the past, I would begin my taxes about a week before the April 15 deadline. Poor Uncle Sam. Before using MacInTax®, I would spend an entire weekend organizing piles of receipts—frantically itemizing my expenses and deductions.”

On discovering MacInTax...
“My sister recommended MacInTax. She had been using a Macintosh® for years, so she knew best. MacInTax proved to be very simple to learn. I was up and running in about 5 minutes. I liked the fact that I could enter my tax information just once, because forms and schedules are linked together, and provide updates and calculations automatically. Make a change on any one of the IRS schedules that apply to you, and your 1040 is instantly updated. MacInTax is a great product—really fun to use.”

The difference MacInTax can make for you...
“You often hear companies making claims about supporting their customers. The MacInTax folks really stand behind their products. Last year I had a problem with my Schedule E. You know how complex real estate can be. I called tech support. They showed me some built-in features and walked me right through the problem.

MacInTax has more forms than I could ever use. All just a mouse click away. When I needed to itemize, I used its built-in itemizing capabilities. It seemed like every time I needed some feature, it was right there. MacInTax made even the most complicated part of my taxes seem simple. I know why MacInTax has won so many awards. It’s just the greatest program. Everyone should buy a Macintosh just so they can use MacInTax.”
MacInTax... the best selling tax product for the Macintosh.

MacInTax has been the best selling Macintosh-based tax product for 5 years in a row, with 750,000 returns filed. With over 80 commonly used tax forms, schedules, worksheets and statements, MacInTax will organize and complete your taxes whatever income bracket you happen to be in. Easy to learn and enjoyable to use, MacInTax continues to be the industry leader—and anyone of our customers will be glad to tell you why.

- Now with Forms Guide, a step-by-step interview that leads you to the specific tax forms that apply to you.
- Graphic tax forms on screen eliminate confusion and minimize learning time.
- Display and access multiple forms on screen—simultaneously. Watch instant calculations and linking between forms, and work just like you would at your desktop.
- Reach complete IRS instructions and helpful tax hints by double clicking the mouse on any line item.
- Completeness Checking and Auto-Find functions direct you to errors, missing information and estimates—for correction prior to final submission.

Critical acclaim!
- Software Publisher's Association —Excellence in Software Award for Best Personal Productivity, 1986.
- Software Publisher's Association —Best Vertical Market Application, MacInTax/Taxview®, 1988.

All forms shown above were printed using MacInTax. No other tax preparation program can do this!

Learn how MacInTax can make a difference for you. See an authorized MacInTax dealer, or call direct and get a free catalog that includes our entire line of tax products—including TaxView for professionals.

For information, call: 1-800-622-6829.
Please circle 38 on reader service card.

All registered marks and trademarksm are of their respective companies. ©1990 Softview, Inc.
If your statistical software is limiting your vision, who knows what you're missing?

Most statistics software makes you look at your data through rose-colored glasses. With procedures so rigid, you’re blinded to the odd exception or hidden relationship. But now there’s Data Desk® for the Macintosh. Created by Cornell Professor Paul Velleman, Data Desk is the only software that is true to the vision of Exploratory Data Analysis. Data Desk lets you view your data from new perspectives, without any pre-conceived notions. So you find out what you need to know—not just what your software lets you.

---

Odesta Corporation
4084 Commercial Ave.
Northbrook, IL 60062

Data Desk®
THE POWER TO EXPLORE

Please circle 130 on reader service card.

Try This at Home...
or from anywhere else.

Leave your office and you can use Carbon Copy Mac to get back there fast without having to return. With its remote features, Carbon Copy Mac lets your Macintosh visit another by viewing its screen, controlling input and output functions, using resources or you can use the file transfer feature to quickly send and retrieve files. You can use Carbon Copy Mac with your modem as well as using your on-site network.

Extensive use has proven Carbon Copy Mac to be both reliable and fast. It’s available in Single Pack, Twin Pack, NetPack (15 nodes) and with the Microcom MacModem. Site licensing is also available.

Carbon Copy Mac...
Remote Control Software and more!

Microcom
500 River Ridge Drive, Norwood, MA 02062
(617) 551-1999

©1991 Microcom, Inc. Carbon Copy Mac is a registered trademark of Microcom, Inc. Macintosh is a trademark of Apple Computer, Inc.

Please circle 77 on reader service card.
THERE'S MORE THAN ONE WAY TO SCAN A CAT

When you want to capture graphics for your Macintosh® there's no need to pussyfoot around with anything less than a low-cost scanner from Thunderware. ThunderScan® Plus and LightningScan® 400 let you turn any printed image into a high-resolution graphic. Then, with powerful software called ThunderWorks,™ you can change, enhance and save images in many ways.

FEED THE KITTY
Have an ImageWriter®? If you think it's just a printer, you're only half right. ThunderScan Plus replaces the ribbon cartridge to make it a high-resolution scanner. Just feed your image into the printer. ThunderScan zips back and forth, scanning with up to 64 levels of gray scale and 300 DPI resolution. Less than $200!

ROLL OVER KITTY
In one quick pass, LightningScan 400 scans any image. Just select a resolution up to 400 DPI. You're ready to roll! The exclusive snap-on guide makes it easy to scan straight. ThunderWorks software lets you combine scans for full page scanning with up to 37 levels of gray scale. Less than $400!

CAT'S UP
Or down. Use ThunderWorks to flip, rotate, re-size and edit in 256 levels of gray on all Macs. Painting tools, the histogram and the gray map editor give you complete control over all or selected parts of the image.

COOL CAT
Change contrast and brightness. Create hair-raising effects with 13 image filters. Have fun! Both Thunderware scanners come complete with ThunderWorks software to let you turn an ordinary house cat into a hip cat.

CAT PRINTS
Print images with striking detail at virtually any size. Put images into newsletters, reports, correspondence, personalized cards and more. Photos, drawings, diagrams, logos and text can be used in all paint, draw and publishing programs.

Whether you use a Mac in business, at home or at school, our low-cost scanners give you as many ways to scan a cat as you can imagine. So pounce on your phone and order one today!

Thunderware, Inc.
21 Orinda Way
Orinda, CA 94563

Orders only: 800/445-1166
415/254-6581
fax: 415/254-3047

Please circle 195 on reader service card.
The majority of products we carry are covered by 30-60 day Money Back Guarantees (as listed here in red). If you're not happy with one of those products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund check (or credit on your credit card). We reserve the right to limit quantities on such returns.

We only carry the very latest versions of products. The version numbers shown here are based on the best available information at press time. Also, all software is not copyrighted, unless indicated otherwise by (CP).

Softview
3470 MachinTax—four time "World Class" and "Eddy" Award Winner Jerry Poumelle, info World columnist says "... MacinTax makes it almost fun to do your taxes." Chock full of new features for 1990! $59.

DAILY BUSINESS

* Aatrix Software ... 30 day MBG
  5872 Checkwriter II 3.0 ... 32.
  8053 Aatrix Ultimate Payroll 1.0 ... 189.
* Abacus Concepts
  4482 StatView SE + Graphics 1.03 ... 179.
  4491 StatView II 1.03 ... 279.
  SuperANOVA 1.1 (for Plus/SE or II) ea ... 309.
  5907 StatView II/SupernoVA Bundle ... 569.
* Acius ... 30 day MBG
  6948 FileForce 1.0 ... 249.
  5618 4th Dimension 2.1 ... 489.
  4024 4th Dimension Runtime (4 user) ... 249.
  7836 4D Compiler 1.0 ... 285.
* Advanced Software ... 30 day MBG
  5608 DocuComp 1.5 ... 89.
  A Lasting Impression
  5465 ResumeExpert ... 48.
  Sales & Marketing, Students, Education, Computer Science & Engineering, Health Services, & Arts & Leisure ... ea ... 48.
  5749 Cover Letters ... 48.
* ASD Software ... 30 day MBG
  7619 Planisoft 1.0 (1 user) ... 139.
  Ashton
  1324 FullWrite 1.0 (while supplies last) ... 39.
  A Lasting Impression
  7446 MacLabel Pro 1.0 ... 49.
* Bravo Technologies ... 30 day MBG
  1539 MacCalc 1.2D ... 79.

Creative Software ... 30 day MBG
6645 Easy Color Paint 2.0—Macworld (9/90) finds it "satisfyingly strong!" MacUser (9/90) gives it 4 Mice, says "it's a pleasure." This new enhanced version makes a perfect holiday gift! $45.

* Chang Labs ... 30 day MBG
  1129 MacWrite II 1.1 ... 142.
  8216 FileMaker Pro ... 218.
  1125 MacProject II 2.1 ... 365.
* Deneba Software ... 30 day MBG
  4700 BigThesaurus 1.0 ... 65.
  1768 Coach Professional 3.1 ... 124.
* Dow Jones ... 30 day MBG
  1788 Market Manager PLUS 2.03 ... 189.
* Electronic Arts ... 30 day MBG
  1543 Thunder II 1.01 (Battery Included) ... 49.

T/Maker ... 30 day MBG
8206 SmartBundle—A total solution for first-time Macintosh buyers: A collection of four easy-to-use applications in one bundle at an incredible price—the best value in Macintosh software today! $215.

* Fox Software ... 30 day MBG
  5572 FoxBASE II/Mac 2.01 ... 292.
* Franklin Software ... 30 day MBG
  7070 Language Master 2.0 ... 59.
  Informix
  4955 Wingz 1.1A ... 245.
* Intuit ... 30 day MBG
  2425 Quicken 1.5 ... 35.
* Leonard Development ... 30 day MBG
  8039 SmartWorks 1.0 ... 185.
  8227 SmartWorks Upgrade (MS Works) ... 99.
* Lifetree Software ... 30 day MBG
  6984 Correct Grammar 1.07 ... 49.

* Mainstay ... 30 day MBG
  7718 MacFlow 3.1.5 ... 125.
  7716 MacSchedule 2.0.4 ... 125.
  7719 Mark Up 1.0.3 ... 152.
* MECA ... 60 day MBG
  2796 Managing Your Money 3.0 ... 135.
* Microlytics ... 60 day MBG
  7233 WordFinder 2.0 ... 34.
  7506 Inside Information ... 68.
  7820 Random House Encyclopedia ... 68.

Softstream Int'l ... 30 day MBG
8175 HyperTax Tutor—Quickly answers your tax questions and leads you thru the jungle of income tax laws. Full explanations for filing tax returns are available at the click of a mouse. $62.

* Microsoft ... 30 day MBG
  2866 File 2.0A ... 123.
  2884 Works 2.06B ... 179.
  4969 Word 4.0A ... 245.
  2865 Excel 2.2A ... 245.
  5434 The Microsoft Office ... 525.
* Microsoft Press
  7680 Word on Apple Mac Book ... 18.
  6500 Excel Money Mgr. Book (incl. disk) ... 25.
* New Horizons ... 30 day MBG
  6262 WordMaker 1.0 ... 65.
* Niles & Associates ... 30 day MBG
  5048 EndLink 1.1.3 ... 58.
  4602 EndNote 1.3 ... 85.
  8010 EndNote Plus 1.0 ... 145.
* Nolo Press ... 60 day MBG
  4228 For the Record 2.0 ... 30.
  2981 WillMaker 4.0 ... 37.
* Odessa ... 30 day MBG
  5621 Double Helix III 3.0R6 ... 389.
  8468 Database 3.0 ... 459.
* Peachtree ... 30 day MBG
  5683 Naus 3.0 ... 245.
  5207 atOnce! 1.1 (formerly Layered) ... 285.

Would you be
a little impressed

Williams & Macias ... 30 day MBG
4976 StickyBusiness 1.3—Mail merge! Supports over 300 labels, cards, & envelopes from all major suppliers. Designs customized templates $51. 6926 myDiskLabeler III 3.0—Reads disks & prints labels & reports with graphics in seconds $42.

MacConnection, 14 Mill Street, Marlboro, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

MacConnection, 14 Mill Street, Marlboro, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

Adobe Systems
1137 Illustrator 3.0—Direct, on-screen entering & manipulation of text. Control every aspect of the characters, including kerning, text on a corner & more. Currently bundled with ATM 2.0 $349. 5750 Adobe Type Manager 2.0 $55.

Adobe Systems
1137 Illustrator 3.0—Direct, on-screen entering & manipulation of text. Control every aspect of the characters, including kerning, text on a corner & more. Currently bundled with ATM 2.0 $349. 5750 Adobe Type Manager 2.0 $55.

Paracomputer
7441 Swivel 3D Professional 1.0—One of the best selling 24-bit 3D program available $439. 7839 FilmMaker 1.0—Features full animation, anti-aliased & transparent & for multimedia presentations $439.

Sensible Software ... 30 day MBG
Sensible Grammar or Bookends ea. 51.

Sensible Software ... 30 day MBG
Sensible Grammar or Bookends ea. 51.

STAR Reference Software ... 30 day MBG
6268 Grammatik Mac 2.0 $50.

STAR Reference Software ... 30 day MBG
6268 Grammatik Mac 2.0 $50.

Softview
3470 MacinTax

Softview
3470 MacinTax

Graphics & Design

Aapps ... 30 day MBG
7117 DigiVideo 1.0 (black & white) .. 398.
7114 DigiVideo Color .. 639.

Aapps ... 30 day MBG
7117 DigiVideo 1.0 (black & white) .. 398.
7114 DigiVideo Color .. 639.

Adobe Systems
Adobe Type Library .. call
Adobe Type Reunion 1.0 .. 38.
Adobe Type Manager 2.0 .. 55.
Adobe Plus Pack/ATM .. 159.
TypeAlign for ATM 1.0 .. 59.
Adobe AT/M/TypeAlign Pack .. 89.
Adobe Type Set 1, 2 or 3 .. call
Adobe Type Sets 1-2-3 Bundle .. 199.

Adobe Systems
Adobe Type Library .. call
Adobe Type Reunion 1.0 .. 38.
Adobe Type Manager 2.0 .. 55.
Adobe Plus Pack/ATM .. 159.
TypeAlign for ATM 1.0 .. 59.
Adobe AT/M/TypeAlign Pack .. 89.
Adobe Type Set 1, 2 or 3 .. call
Adobe Type Sets 1-2-3 Bundle .. 199.

STAR Reference Software ... 30 day MBG
6268 Grammatik Mac 2.0 $50.

STAR Reference Software ... 30 day MBG
6268 Grammatik Mac 2.0 $50.

Softview
3470 MacinTax

Softview
3470 MacinTax

Graphics & Design

Aapps ... 30 day MBG
7117 DigiVideo 1.0 (black & white) .. 398.
7114 DigiVideo Color .. 639.

Aapps ... 30 day MBG
7117 DigiVideo 1.0 (black & white) .. 398.
7114 DigiVideo Color .. 639.

Adobe Systems
Adobe Type Library .. call
Adobe Type Reunion 1.0 .. 38.
Adobe Type Manager 2.0 .. 55.
Adobe Plus Pack/ATM .. 159.
TypeAlign for ATM 1.0 .. 59.
Adobe AT/M/TypeAlign Pack .. 89.
Adobe Type Set 1, 2 or 3 .. call
Adobe Type Sets 1-2-3 Bundle .. 199.

Adobe Systems
Adobe Type Library .. call
Adobe Type Reunion 1.0 .. 38.
Adobe Type Manager 2.0 .. 55.
Adobe Plus Pack/ATM .. 159.
TypeAlign for ATM 1.0 .. 59.
Adobe AT/M/TypeAlign Pack .. 89.
Adobe Type Set 1, 2 or 3 .. call
Adobe Type Sets 1-2-3 Bundle .. 199.

Williams & Macias ... 30 day MBG
4976 StickyBusiness 1.3—Mail merge! Supports over 300 labels, cards, & envelopes from all major suppliers. Designs customized templates $51. 6926 myDiskLabeler III 3.0—Reads disks & prints labels & reports with graphics in seconds $42.

Williams & Macias ... 30 day MBG
4976 StickyBusiness 1.3—Mail merge! Supports over 300 labels, cards, & envelopes from all major suppliers. Designs customized templates $51. 6926 myDiskLabeler III 3.0—Reads disks & prints labels & reports with graphics in seconds $42.
If your order came

Broderbund Software
1427 The Print Shop 1.3.1 35.
6281 TypeStyler 1.5 115.
**CE Software 30 day MBG
7481 Amazing Paint 1.0 65.
1123 MacPaint 2.0 92.
1117 MacDraw II 1.1 289.
8007 Claris CAD 2.0 649.
**Computer Associates/Cricket
1668 CA-Cricket Graph 1.3.2 119.
**Creative Software 30 day MBG
6645 Easy Color Paint 2.0 45.
**Custom Applications 30 day MBG
8037 Freedom of Press Light 17 fonts 56.
6517 Freedom of Press 3.0 255.
**DeltaPoint 30 day MBG
6095 DeltaGraph 1.5 109.
**Deneba Software 30 day MBG
6365 UltraPaint 1.0 125.
1769 Canvas 2.1 169.
**Design Science 30 day MBG
8205 Parafont 59.
**Dream Maker 30 day MBG
MacGallery (Paint or HyperCard) ea. 27.

Tactic Software 30 day MBG
8251 Icon It! Quickly creates custom icons for all applications $45.
8253 Magic Typist A time saving utility to relieve you from typing long words, sentences and paragraphs over again $50.

Cl iptures: Business 1 or 2 ea. $69.
Cl iptures: Sports 3 ea. 69.
**Dubl-Click Software
WetPaint Clip-Art ea. 42.
**Electronic Arts 30 day MBG
6056 Studio/32 .... 449.
**Farallon Computing 30 day MBG
6770 MacRecorder Voice Digitizer 69.
2109 MacRecorder Sound System 2.01 169.
**Foundation Publishing 60 day MBG
6728 Comic Strip Factory 1.6 37.
7454 Generic CADD 1.0 375.
**Innovative Data Design
2417 MacDraft 2.1 279.
4707 Dreams 1.1 319.
**Jericho 30 day MBG
2619 ImageStudio 1.5 139.
2621 Ready Set Go! 4.5A 165.
4709 LetraStudio 1.5 275.
6300 FontStudio 1.0 359.
6301 ColorStudio 1.0 649.

Reality Technologies 30 day MBG
6929 WealthBuilder 1.0 Earn more, invest wisely & save effectively with WealthBuilder, your complete personal planning & investment system. Objective information on up to 1,200 mutual funds & 10,000 stocks & bonds $145.

**Linguist's Software 60 day MBG
Over 100 language fonts call MacKanj 6.0 or LaserVietnamese ea. 79.
**MacroMind 30 day MBG
6159 MacroMind Accelerator 125.
5087 MacroMind Director 2.0 439.
**Mainstay 30 day MBG
7714 Capture 3.0 $45.
**MediaLab Tech. 30 day MBG
8218 Picture Link 225.
**Microsoft 30 day MBG
7886 ENHANCE 1.0 389.
**MicroMaps 30 day MBG
7554 MapArt (Paint) MapArt (EPS) or MapArt (PICT) $41.
**MicroFrontier 30 day MBG
2878 PowerPoint 2.01 245.
**PANTONE
7466 Process Color Imaging Guide 49.
Paracompa
7421 DrawTools 1.0 82.
7728 Swivel 3D 1.1 295.
4597 Swivel 3D Professional 1.0 439.
7441 Swivel 3D Professional 1.0 375.
5028 Model Shop 1.1 375.
7839 FilmMaker 1.0 439.

JAM Software 30 day MBG
6089 Smart Alarms with Appointment Diary 3.0 A Macintosh reminder and calendar system featuring: auto backup, variable snooze, multiple reminders, weekly and monthly views, and zoom. Multiple users available $63.

**Preferred Publishers 30 day MBG
7828 Exposure Pro 69.
8055 Screenshot 31.
**Quark
7612 Quark XPress 3.0 529.
**Softview
7499 iX Forms Designer 1.0 169.
**Strata
7773 StrataVision 3D 369.
7772 StrataVision 3D/Renderman Bundle 999.
**Strategic Mapping
6518 ATLAS+MapMaker 4.5 369.
**SuperMac Tech. 60 day MBG
5625 PixelPaint Professional 2.0 465.
**Symmetry 30 day MBG
8172 Mariah 1.0 94.
**Tactic Software 30 day MBG
8251 Icon It $45.
5236 CanOpener 1.1 63.
**Advanced Software 30 day MBG
8051 In Touch 1.0 40.
<table>
<thead>
<tr>
<th>Product Name</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TurboTax Personal/Quattro Pro 1.0</td>
<td>Easy to use and the most complete software for preparing individual tax returns. TurboTax provides on-line help, IRS instructions and comprehensive tax assistance. $50.</td>
<td></td>
</tr>
<tr>
<td>Affinity Microsystems</td>
<td>60 day MBG</td>
<td></td>
</tr>
<tr>
<td>Tempo II 1.2.2</td>
<td></td>
<td>93.</td>
</tr>
<tr>
<td>Tempo II Plus</td>
<td></td>
<td>105.</td>
</tr>
<tr>
<td>Aladdin Systems</td>
<td>30 day MBG</td>
<td></td>
</tr>
<tr>
<td>Shortcut 1.5</td>
<td></td>
<td>46.</td>
</tr>
<tr>
<td>Programmer's Assistant 1.0</td>
<td></td>
<td>57.</td>
</tr>
<tr>
<td>StuffIt Deluxe 1.1</td>
<td></td>
<td>62.</td>
</tr>
<tr>
<td>Aldus/Silicon Beach 30 day MBG</td>
<td></td>
<td>199.</td>
</tr>
<tr>
<td>ASD Software 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileGuard Extended 2.1 (1 user)</td>
<td></td>
<td>145.</td>
</tr>
<tr>
<td>BASELINE Publishing 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INIT Manager</td>
<td></td>
<td>35.</td>
</tr>
<tr>
<td>Berkeley Systems 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Dark 2.0</td>
<td></td>
<td>22.</td>
</tr>
<tr>
<td>Stepping Out II 2.0</td>
<td></td>
<td>49.</td>
</tr>
<tr>
<td>Bravo 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAMM 1.1</td>
<td></td>
<td>48.</td>
</tr>
<tr>
<td>Casady &amp; Greene 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QuickDEX 1.4</td>
<td></td>
<td>34.</td>
</tr>
<tr>
<td>A.M.E. 1.1</td>
<td></td>
<td>159.</td>
</tr>
<tr>
<td>CE Source 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MockPackage Plus Utilities 4.4</td>
<td></td>
<td>31.</td>
</tr>
<tr>
<td>CalendarMaker 3.0</td>
<td></td>
<td>31.</td>
</tr>
<tr>
<td>DiskTop 4.0</td>
<td></td>
<td>63.</td>
</tr>
<tr>
<td>Alarming Events 1.0</td>
<td></td>
<td>85.</td>
</tr>
<tr>
<td>QuickKeys 2.0</td>
<td></td>
<td>94.</td>
</tr>
<tr>
<td>Central Point 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copy II Mac 7.2</td>
<td></td>
<td>23.</td>
</tr>
<tr>
<td>Mac Tools Deluxe 1.0</td>
<td></td>
<td>75.</td>
</tr>
<tr>
<td>Connectix 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maxima 1.0</td>
<td></td>
<td>69.</td>
</tr>
<tr>
<td>Virtual 2.03 (for SE/30, Iicx, IIx, &amp; IIc)</td>
<td></td>
<td>115.</td>
</tr>
<tr>
<td>Virtual 2.02 (for Mac II, incl, PMMU)</td>
<td></td>
<td>188.</td>
</tr>
<tr>
<td>antz Development 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retrospect Remote 1.2</td>
<td></td>
<td>148.</td>
</tr>
<tr>
<td>Remote (10 Pack)</td>
<td></td>
<td>148.</td>
</tr>
<tr>
<td>Design Science 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MathType 2.0</td>
<td></td>
<td>89.</td>
</tr>
<tr>
<td>Digiktal 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SmallTalk/V Mac 1.1</td>
<td></td>
<td>$124.</td>
</tr>
<tr>
<td>Dubl-Click Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ClickChange</td>
<td></td>
<td>41.</td>
</tr>
<tr>
<td>Calculator Construction Set 2.05</td>
<td></td>
<td>45.</td>
</tr>
<tr>
<td>Fifth Generation 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PYROI 4.0 (screen saver)</td>
<td></td>
<td>25.</td>
</tr>
<tr>
<td>Suitecase II 1.2.6</td>
<td></td>
<td>49.</td>
</tr>
<tr>
<td>File Director 1.0</td>
<td></td>
<td>82.</td>
</tr>
<tr>
<td>FastBack II 2.5 or DiskLock 2.0</td>
<td></td>
<td>118.</td>
</tr>
<tr>
<td>SuperSpeed 5.0</td>
<td></td>
<td>62.</td>
</tr>
<tr>
<td>SuperLaserSpeed 2.0</td>
<td></td>
<td>93.</td>
</tr>
<tr>
<td>SuperLaserSpeed 5 Pack 2.02</td>
<td></td>
<td>315.</td>
</tr>
<tr>
<td>Foundation Publishing 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HyperSpeller 1.0</td>
<td></td>
<td>29.</td>
</tr>
<tr>
<td>HyperGlot 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ReflexBase 1.0</td>
<td></td>
<td>105.</td>
</tr>
<tr>
<td>Hyperpress Publishing 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Icon Factory 1.0</td>
<td></td>
<td>45.</td>
</tr>
<tr>
<td>Symmetry 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 1.0 The “put everything...find anything” multimedia organizer! Combine sounds, graphics, text and animation in the same customized catalogue. Search volumes in seconds! 14 image formats supported. $94.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magic Software 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AutoSave II 1.1</td>
<td></td>
<td>28.</td>
</tr>
<tr>
<td>POWERIcons 1.0</td>
<td></td>
<td>39.</td>
</tr>
<tr>
<td>Backmarric 1.1</td>
<td></td>
<td>50.</td>
</tr>
<tr>
<td>MainStay 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marco Polo 1.0</td>
<td></td>
<td>152.</td>
</tr>
<tr>
<td>Microcom 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>View 2.8</td>
<td></td>
<td>56.</td>
</tr>
<tr>
<td>Microlytics 60 day MBG</td>
<td></td>
<td>45.</td>
</tr>
<tr>
<td>GOfer 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microseeds Pub. 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INITPicker 2.0</td>
<td></td>
<td>35.</td>
</tr>
<tr>
<td>Redux 1.62 or Rival 1.1.4...ea. 49.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QuicBasic 1.0</td>
<td></td>
<td>64.</td>
</tr>
<tr>
<td>Millenium Software 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HyperX 4.0</td>
<td></td>
<td>99.</td>
</tr>
<tr>
<td>Portfolio Systems 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamo 2.0. For FiloFax, Day-Timer, or any personal organizer. Manages &amp; prints addresses, labels, &amp; rolodex cards tool includes free DA. $57.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9921 Dynastage 1.0-Prints any Macintosh file to personal-organizer pages. Just insert and go! $57.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICQ Simulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On Cue 1.3</td>
<td></td>
<td>35.</td>
</tr>
<tr>
<td>HyperTMON 1.0</td>
<td></td>
<td>57.</td>
</tr>
<tr>
<td>TM0N 2.8.4</td>
<td></td>
<td>96.</td>
</tr>
<tr>
<td>Individual Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Macros Excel or MS Word ea. 26.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>101 Scripts &amp; Buttons HyperCard 1.2 35.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insight Development 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacPrint 1.23</td>
<td></td>
<td>94.</td>
</tr>
<tr>
<td>JAM Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smart alarms 3.0 w/Appnt. Diary 3.1</td>
<td></td>
<td>63.</td>
</tr>
<tr>
<td>Smart alarms 3.0 (14 users)</td>
<td></td>
<td>125.</td>
</tr>
<tr>
<td>Kent Marsh Ltd. 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QuickLock 2.0</td>
<td></td>
<td>34.</td>
</tr>
<tr>
<td>The NightWatch 1.0</td>
<td></td>
<td>85.</td>
</tr>
<tr>
<td>MacSafe II</td>
<td></td>
<td>107.</td>
</tr>
<tr>
<td>Kiwi Software 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KiwiLorer 3.0</td>
<td></td>
<td>33.</td>
</tr>
<tr>
<td>KiwiFinder Extended 1.0</td>
<td></td>
<td>65.</td>
</tr>
<tr>
<td>Loop Software 30 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PictureBook 3.2</td>
<td></td>
<td>39.</td>
</tr>
<tr>
<td>FastBack 1.5 or Disklock 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CrunchBase 3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileGuard 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NetWork DiskFit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network DiskFit for AppleShare and TOPS Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuperMacTech 60 day MBG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3377 DiskFit 2.0-Simple, reliable backup to all types of media. New 2.0 version now has enhanced folder selection, unattended backup, and more. Try Network DiskFit for AppleShare and TOPS Networks $58.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Shipping 'til 3:15 (AM)

Now Software ... 30 day MBG
6925 Now Utilities 2.0 .................................. $75.
6739 Prototyper 3.0 .................................... 194.
Olduvai
4503 MultiClip 2.0 ...................................... 72.
★ON Technology ... 1 year MBG
3379 Network DiskFit 1.5 ................................ 225.
6385 On Location 1.0.2 ................................ 75.
Palomar Software
8210 Plottergeist 1.0 ..................................... 199.
8120 Plottergeist 2.1 ...................................... 56.
8449 SuperGlue II 2.01 ................................... 75.
6647 HandOff II ............................................ 52.
6656 Personality 1.1 ...................................... 49.
★Sallent Software ... 30 day MBG
6656 Personality 1.1 ...................................... 49.
7404 DiskDoubler 3.0 ..................................... 45.
7403 Partner 1.01 .......................................... 56.
★Softstream Int'l ... 30 day MBG
5440 HyperKit 2.2 ........................................ 119.
7450 HyperKit Relative .................................. 269.
★Software Innovations ... 30 day MBG
6647 HandOff II ............................................ 52.
3448 SmartScrap & The Clipper 2.1 .................... 56.
3449 SuperGlue II 2.01 ................................... 75.
★Somak Software ... 30 day MBG
ScriptEdit 2.0 or SharpenUp 1.0 ea. 62.

Penton Overseas ... 30 day MBG
Vocaluniversity—Building blocks of language.
New version features: type answers, user
modifiable options, create personal data stacks,
keep statistics, & more. 3 hours of sound.
Includes free HyperCard 2.0. see line listing.
6927 StickyBusiness Plus 1.3 (bar codes) .......... 91.
Wolfram Research
8276 Mathematica ........................................ 449.
8273 Mathematica Enhanced .......................... 699.
★Zedcor ... 60 day MBG
3985 ZBasic 5.0 .......................................... 99.

CD-ROM
Activision
5127 Manhole (CD-ROM) ................................ 34.
5825 Cosmic Osmo (CD-ROM) ......................... 40.
Broderbund Software
5237 Whole Earth Catalog (CD-ROM) ............... 89.
CD Technology
8057 CD-ROM Ports Drive ............................... 649.
★Farallon Computing ... 30 day MBG
6767 MediaTracks Multimedia CD Pack ............ 319.
★Highlighted Data ... 30 day MBG
7771 Webster's Dictionary (CD-ROM) .............. 159.
★HyperGlot ... 30 day MBG
7473 Learn to Speak French (CD-ROM) .............. 175.
7829 Learn to Speak Spanish (CD-ROM) ............ 175.
★Macromind ... 30 day MBG
7712 MacroMind CD-ROM ................................ 125.

Televare ... 30 day MBG
7616 M.Y.O.B. 2.0—Incredible accounting
software. “Best business deal on the Mac” —
MacUser Eddy Awards. A/R, A/P, G/L,
Inventory, and Card File. Easy to set up
and use, full integration, custom forms. $145.

EDUCATION & RECREATION
Accolade
8221 Balance of the Planet ............................. 29.
8217 Ishido: The Way of the Stones ................. 32.
8220 Jack Nicklaus Greatest 18. ................. 18.
Activision
4486 Manhole ............................................. 28.
★Aldus/Silicon Beach ... 30 day MBG
5825 Cosmic Osmo (CD-ROM) ......................... 40.
Dark Castle or Beyond Dark Castle ea. 32.
★Ars Nova ... 30 day MBG
1215 Practica Musica 2.2 .............................. 99.
★Baseline Publishing ... 30 day MBG
7785 Talking Moose .................................... 23.
★Beacon Technology ... 30 day MBG
6135 Super Studio Session w/Music Library 99.
★Bright Star Technology
1402 Alphabet Blocks 1.0 ............................ 30.

MICROSOFT - 30 day MBG
6392 The Microsoft Office (CD-ROM) .......................... $599.
NEC
Image Gallery, Image Folio, Type
Gallery PS, Photo Gallery or Clip-Art 3D
(CD-ROM) ...................................................... ea. 246.
6744 CDR35 CD-ROM Portable Drive ............... 399.
7352 Battery Pack for CDR35 ......................... 59.
6743 Mac Driver Kit ...................................... 64.
8255 Desktop Music Creativity (CD-ROM) .......... 189.
★Somak Software ... 30 day MBG
LaserArt CD-ROM Vol. 1 or 2 ea. 62.
Toshiba
6749 XM 3201 CD-ROM Drive .......................... 779.
★Wayzata Tech. ... 60 day MBG
8219 CD FunTime .......................................... 35.
6576 Vietnam Remembered (CD-ROM) ............... 69.
7678 USA Factbook (CD-ROM) .......................... 75.
7679 Disc Trac Prog. Detective (CD-ROM) .......... 75.
7685 Best of MacTutor (CD-ROM) ...................... 99.
7374 Sport News Baseball Stats (CD-ROM) .......... 139.
6370 QuickArt (CD-ROM) ................................... 175.
7864 N. Amer. Facsimile Book (CD-ROM) ............ 269.

Microsoft ... 30 day MBG
6392 The Microsoft Office (CD-ROM) .......................... $599.
NEC
Image Gallery, Image Folio, Type
Gallery PS, Photo Gallery or Clip-Art 3D
(CD-ROM) ...................................................... ea. 246.
6744 CDR35 CD-ROM Portable Drive ............... 399.
7352 Battery Pack for CDR35 ......................... 59.
6743 Mac Driver Kit ...................................... 64.
8255 Desktop Music Creativity (CD-ROM) .......... 189.
★Somak Software ... 30 day MBG
LaserArt CD-ROM Vol. 1 or 2 ea. 62.
Toshiba
6749 XM 3201 CD-ROM Drive .......................... 779.
★Wayzata Tech. ... 60 day MBG
8219 CD FunTime .......................................... 35.
6576 Vietnam Remembered (CD-ROM) ............... 69.
7678 USA Factbook (CD-ROM) .......................... 75.
7679 Disc Trac Prog. Detective (CD-ROM) .......... 75.
7685 Best of MacTutor (CD-ROM) ...................... 99.
7374 Sport News Baseball Stats (CD-ROM) .......... 139.
6370 QuickArt (CD-ROM) ................................... 175.
7864 N. Amer. Facsimile Book (CD-ROM) ............ 269.

Teleware ... 30 day MBG
7616 M.Y.O.B. 2.0—Incredible accounting
software. “Best business deal on the Mac” —
MacUser Eddy Awards. A/R, A/P, G/L,
Inventory, and Card File. Easy to set up
and use, full integration, custom forms. $145.

Broderbund Software
8266 SimEarth—Simulates many different aspects
of a planet including climate, evolution, atmosphere
composition and civilization. Manipulate
atmospheric, geospheric, climatic and life pro­cesses while watching your planet evolve. $40.

★Spinnaker ... 30 day MBG
6692 PLUS 2.0 ............................................. 115.
★SuperMac Tech. ... 60 day MBG
3377 DiskFit 2.0 ........................................... 58.
3379 Network DiskFit 1.6 ................................ 255.
★Symantec ... 30 day MBG
5176 Symantec AntiVirus for Mac (SAM) .......... 67.
5724 Symantec Utilities for Mac (SUM II) .......... 99.
3421 THINK PASCAL 3.0 ................................... 165.
3420 THINK C 4.0 .......................................... 165.
6748 Norton Utilities for the Mac 1.0 .................. 84.
★Syntex ... 30 day MBG
7147 MacEnvelope 5.0 .................................... 57.
6668 MacEnvelope Plus 2.0 ................................ 159.
★Systems Compatibility ... 30 day MBG
7872 Software Bridge 1.0 ................................ 79.
★Teletypingest ... 30 day MBG
8058 TScript ................................................ 92.
★TGS Systems ... 30 day MBG
6667 Prograhm 2.0 Compiler Version ................ 245.
6667 Prograhm 2.0 Interpreter Version ................ 245.
3781 LaserWriter Label Pack (21s) ................... 18.
6926 myDiskLabeler 3.0 .................................. 42.
4976 StickyBusiness 1.3 ..................................... 51.

Microseeds Pub. ... 60 day MBG
7116 Rival 1.4.4—Affords complete protection
from viruses without tedious disk scans. Just
put Rival into your System Folder and you’re
totally safe. User groups get new vaccines for free. $49.

EDUCATION & RECREATION
Accolade
8221 Balance of the Planet ............................. 29.
8217 Ishido: The Way of the Stones ................. 32.
8220 Jack Nicklaus Greatest 18. ................. 18.
Activision
4486 Manhole ............................................. 28.
★Aldus/Silicon Beach ... 30 day MBG
5825 Cosmic Osmo (CD-ROM) ......................... 40.
Dark Castle or Beyond Dark Castle ea. 32.
★Ars Nova ... 30 day MBG
1215 Practica Musica 2.2 .............................. 99.
★Baseline Publishing ... 30 day MBG
7785 Talking Moose .................................... 23.
★Beacon Technology ... 30 day MBG
6135 Super Studio Session w/Music Library 99.
★Bright Star Technology
1402 Alphabet Blocks 1.0 ............................ 30.
<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timbuktu 3.1.30-Pack</td>
<td>$128.5</td>
</tr>
<tr>
<td>Timbuktu/Remote 2.0</td>
<td>$123</td>
</tr>
<tr>
<td>Timbuktu/Remote Access Pack</td>
<td>$84.5</td>
</tr>
<tr>
<td>PhoneNET StarConnector</td>
<td>$17</td>
</tr>
<tr>
<td>PhoneNET StarConnector 10-Pack</td>
<td>$129</td>
</tr>
<tr>
<td>PhoneNET Connector (DIN-8)</td>
<td>$31</td>
</tr>
<tr>
<td>PhoneNET Connector 10-Pk (DIN-8)</td>
<td>$198</td>
</tr>
<tr>
<td>PhoneNET StarController 360</td>
<td>$825</td>
</tr>
<tr>
<td>PhoneNET StarController-EN</td>
<td>$1599</td>
</tr>
<tr>
<td>MediaTracker MediaPack</td>
<td>$189</td>
</tr>
<tr>
<td>MediaTracks Multimedia Pack</td>
<td>$319</td>
</tr>
<tr>
<td>Fastsoft 60 day MBG</td>
<td>$145</td>
</tr>
<tr>
<td>White Knight 11</td>
<td>$85</td>
</tr>
<tr>
<td>Smartcom II 3.1C</td>
<td>$84</td>
</tr>
<tr>
<td>Smart modem 2400</td>
<td>$349</td>
</tr>
<tr>
<td>V2400 Baud Modern</td>
<td>$489</td>
</tr>
<tr>
<td>V9600 Baud Modern</td>
<td>$719</td>
</tr>
<tr>
<td>Personal Server Network (PSN)</td>
<td>$108</td>
</tr>
<tr>
<td>In/Out</td>
<td>$195</td>
</tr>
<tr>
<td>Rapport</td>
<td>$195</td>
</tr>
<tr>
<td>SoftPC-AT/EGA Module</td>
<td>$125</td>
</tr>
<tr>
<td>SoftPC 1.3</td>
<td>$245</td>
</tr>
<tr>
<td>Timeworks 30 day MBG</td>
<td>$145</td>
</tr>
<tr>
<td>[Other products listed]</td>
<td></td>
</tr>
</tbody>
</table>

**Software Tools**

- Chessmaster 2100 1.1: $32
- Mavis Beacon Typing 1.3 (CP): $32
- Life & Death (CP): $32
- Cribbage King-Gin King: $39
- Spectr Hornolyte 30 day MBG: $19
- Text 1.1 or WritCrin 1.1: $19
- Faces: $22
- Falcon 2.2: $30
- Spinnaker 30 day MBG: $28
- Sargon IV: $52
- MacSci: $40

**Networks & Communications**

- Abaton 30 day MBG: $6266
- InterFax 24/66 Modern: $418
- Flash 1.1: $127
- Browser Bros. 30 day MBG: $187
- QuickMail 2.2.3 (10 user): $155
- CompuServe 60 day MBG: $315
- Macintosh Membership Kit: $23
- CompuServe Navigator 3.0: $49
- Membership Kit/Navigator Bundle: $69
- DataVault 60 day MBG: $117
- MacLink Plus/PC 4.5: $98
- MacLink Plus/Translators 4.5: $98
- Dove Computer 60 day MBG: $299
- Dow Jones 30 day MBG: $299
- NewsRetrieval Membership Package: $24
- AllShare 1.0: $139
- Farallon Computing 30 day MBG: $95

**Intel Corporation**

- 2400EX Modern: $179
- 2400EX with QuickLink II: $195
- 2400EX MNP Modern: $229
- 2400EX MNP with QuickLink II: $249
- 2400EX MNP with FastBack II: $325
- Drive 360 or Drive 1200: $249
- Drive 2.4 (includes FastBack II): $325
- CarbonCopy Mac (Single 2 req.): $117
- CarbonCopy Mac (Twin Pack): $169
- MacModem V.32: $689
- NetBridge or TeleBridge: $339
- NetBridge or TeleBridge: $339
- NuvoTech 60 day MBG: $429
- TurboNet ST (DIN-8): $30
- TurboNet ST (12-Pack): $279
- NuvoLink II: $275
- NuvoLink SC: $309
- NuvoBridge: $319
- Oracle Technology 30 day MBG: $459
- OracleFax Modern: $459
- Practical Peripherals 30 day MBG: $179
- PM 2400SA MNP Modern: $209

**Software Ventures**

- Mac Communications Pack 1.5: $225
- Shiva 30 day MBG: $275
- NetBridge or TeleBridge: $339
- NetModem V2400: $429
- NetModem V.32: $1429
- EtherGate: $1629
- FastPath IV: $1899
- TOPS Teleconnector (DIN8): $23
- TOPS FlashBox: $118
- TOPS Flashcard: $155
- MacPrint TOPS Network Version 1.0: $165
- TOPS Networking Bundle: $300
- Solutions, Inc. 30 day MBG: $215
- MailMaker 5 User Pack 1.1: $119
- FAXGate Plus 1.1: $246
- BackFax 1.5: $153
- Synergy 30 day MBG: $88
- VersaTerm 4.1.1: $174
- VersaTerm-PRO 3.1.1: $174
- Traveling Software 60 day MBG: $93

**DiskDoubler**

- Macintosh: $45

**Sailent Software**

- DiskDoubler 5.0: $3729
- LapLink Mac III Connectivity Pac: $93
Dear MacConnection,

Your “last peanut” catalog prompts me to say how delightful it is to deal with a company that does so many things the right way. And now your prompt, accurate, and reliable delivery is being accomplished with environmental consciousness! My daughter (an attorney with the Environmental Defense Fund) will approve wholeheartedly. I find it striking that all this good stuff comes from a little town in the middle of New Hampshire. It’s too bad some U.S. companies haven’t learned the lessons that your company exemplifies. Have you ever considered going into automobile manufacturing?

James R. Florini, Ph.D.
Professor of Biochemistry
Syracuse University

Have you ever considered going into automobile manufacturing?

James R. Florini

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444  603/446-7711  FAX 603/446-7791

Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!
Same-day delivery.

Curtis Manufacturing
9046 MVP Mouse 29.
★Goldstein & Blair ... 30 day MBG
8198 "What Do I Do Now?" Book 9.
2267 The Macintosh Bible (3rd Ed.) 19.
★I/O Design ... 30 day MBG
2379 MacLuggage ImageWare II 49.
2381 MacLuggage Macinware SE 75.
6129 Ultimate SE Carrying Case 79.
★Kensington ... 30 day MBG
2559 Apple Security Kit 33.
2566 System Saver Mac (platinum) 63.
6763 SE Radiation/Anti-Glare Filter 52.
5064 Apple Color Monitor Polarizing Filter 63.
★MacConnection ... 60 day MBG
4623 Solid Oak Disk Case (holds 80 disked) 32.
★Mobius Technologies ... 60 day MBG
4470 Fanny Mac QT 55.
★Moustrak ... 60 day MBG
Available in blue (listed) or gray.
2694 Moustrak Pad (standard 9" x 9") 8.
2692 Moustrak Pad (large 9" x 11") 9.
2693 Moustrak Pad/LF (large 9" x 11") 10.

Practical Peripherals ... 30 day MBG

ACCESSORIES

Apple Computer
6717 MID Interface 84.
7748 Personal LaserWriter Toner Cart 89.
1114 LaserWriter Plus Toner Cartridge 99.
1115 LaserWriter II Toner Cartridge 105.
★Avery ... 60 day MBG
4807 Laser Labels 1" x 2½" (Qty. 3000) 24.
4864 Disk Labels 3½" (Qy. 250) 13.
5392 Disk Labels 3½"- "Laser (Qy. 630) 29.
4865 Address Labels 3½" x 15½" (3750) 15.
4811 Transparencies 8½" x 11" (Qy. 50) 22.
★Basic Needs ... 60 day MBG
Dust Covers ... 60 day MBG
Hot Top Keyboards ... ea. 15.
7413 Mac IIcx/CI Monitor Stand 40.
7417 Cordless Mouse 89.
★Computer Coverup ... 60 day MBG
1723 ImageWriter II Cover 8.
★CosStar ... 30 day MBG
7453 The Organizer Jr 79.
6091 The Organizer 199.

MegaGraphics
19" Rival Monochrome System for SE, SE/30 or II—Macworld Editors' Choice in large screens. 1024 x 826 resolution with flicker-free 75 Hz refresh and perfect contrast. 19" display with tiltable swivel base. Includes interface card. each $1269.

Ribbons
3255 ImageWriter II Ribbon Black 4.
3261 ImageWriter II Ribbon Multi-4-Color 9.
★Sopris Softworks ... 60 day MBG
4019 Mac SE & Ext. Keyboard Cover (navy) 15.
4017 ImageWriter II Cover (navy) 11.
★Targus ... 60 day MBG
3618 ImageWriter II Carrying Case 45.
3617 Mac Plus/SE Carry Case 55.
★Trip Lite ... 30 day MBG
6200 Isobar 6 (surge suppressor, 6 outlets) 59.

STORAGE MEDIA
★Sony ... 60 day MBG
3297 3½" DS/DD Disks (10) 13.
6148 3½" DS/DD Disks 3 Pak (30) 30.
3298 3½" HD Disks 1.44 Meg (10) 22.
6375 3½" HD Disks 3 Pak (30) 36.
6659 QR2040 40 MB Data Cartridge 19.
★MacConnection ... 60 day MBG
5892 44 Meg Removable Cartridge 85.

WordPerfect ... 60 day MBG
3800 WordPerfect Mac 1.0.5—Includes a lightning fast, 115,000-word spelling checker, thesaurus with 100,000 synonyms and antonyms, multiple headers and footers, auto-pagination and conditional search and replace. 229.

Curtis Manufacturing
9046 MVP Mouse 29.
★Goldstein & Blair ... 30 day MBG
8198 "What Do I Do Now?" Book 9.
2267 The Macintosh Bible (3rd Ed.) 19.
★I/O Design ... 30 day MBG
2379 MacLuggage ImageWare II 49.
2381 MacLuggage Macinware SE 75.
6129 Ultimate SE Carrying Case 79.
★Kensington ... 30 day MBG
2559 Apple Security Kit 33.
2566 System Saver Mac (platinum) 63.
6763 SE Radiation/Anti-Glare Filter 52.
5064 Apple Color Monitor Polarizing Filter 63.
★MacConnection ... 60 day MBG
4623 Solid Oak Disk Case (holds 80 disked) 32.
★Mobius Technologies ... 60 day MBG
4470 Fanny Mac QT 55.
★Moustrak ... 60 day MBG
Available in blue (listed) or gray.
2694 Moustrak Pad (standard 9" x 9") 8.
2692 Moustrak Pad (large 9" x 11") 9.
2693 Moustrak Pad/LF (large 9" x 11") 10.

Practical Peripherals ... 30 day MBG

ACCESSORIES

Apple Computer
6717 MID Interface 84.
7748 Personal LaserWriter Toner Cart 89.
1114 LaserWriter Plus Toner Cartridge 99.
1115 LaserWriter II Toner Cartridge 105.
★Avery ... 60 day MBG
4807 Laser Labels 1" x 2½" (Qty. 3000) 24.
4864 Disk Labels 3½" (Qy. 250) 13.
5392 Disk Labels 3½"- "Laser (Qy. 630) 29.
4865 Address Labels 3½" x 15½" (3750) 15.
4811 Transparencies 8½" x 11" (Qy. 50) 22.
★Basic Needs ... 60 day MBG
Dust Covers ... 60 day MBG
Hot Top Keyboards ... ea. 15.
7413 Mac IIcx/CI Monitor Stand 40.
7417 Cordless Mouse 89.
★Computer Coverup ... 60 day MBG
1723 ImageWriter II Cover 8.
★CosStar ... 30 day MBG
7453 The Organizer Jr 79.
6091 The Organizer 199.

MegaGraphics
19" Rival Monochrome System for SE, SE/30 or II—Macworld Editors' Choice in large screens. 1024 x 826 resolution with flicker-free 75 Hz refresh and perfect contrast. 19" display with tiltable swivel base. Includes interface card. each $1269.

Ribbons
3255 ImageWriter II Ribbon Black 4.
3261 ImageWriter II Ribbon Multi-4-Color 9.
★Sopris Softworks ... 60 day MBG
4019 Mac SE & Ext. Keyboard Cover (navy) 15.
4017 ImageWriter II Cover (navy) 11.
★Targus ... 60 day MBG
3618 ImageWriter II Carrying Case 45.
3617 Mac Plus/SE Carry Case 55.
★Trip Lite ... 30 day MBG
6200 Isobar 6 (surge suppressor, 6 outlets) 59.

STORAGE MEDIA
★Sony ... 60 day MBG
3297 3½" DS/DD Disks (10) 13.
6148 3½" DS/DD Disks 3 Pak (30) 30.
3298 3½" HD Disks 1.44 Meg (10) 22.
6375 3½" HD Disks 3 Pak (30) 36.
6659 QR2040 40 MB Data Cartridge 19.
★MacConnection ... 60 day MBG
5892 44 Meg Removable Cartridge 85.

WordPerfect ... 60 day MBG
3800 WordPerfect Mac 1.0.5—Includes a lightning fast, 115,000-word spelling checker, thesaurus with 100,000 synonyms and antonyms, multiple headers and footers, auto-pagination and conditional search and replace. 229.
Suitcase II is the award-winning software that gives you unlimited access to all your fonts and desk accessories, all the time. Without having to use Font/DA Mover to install and deinstall them. Without cluttering up your system file.

Suitcase II lets you view an unlimited number of fonts in their own typefaces at any moment, so you can pick the right face at the right time, without breaking stride. You'll never have to reboot your Macintosh to install a new font, or search through a cluttered System File to find what you need. Font ID conflicts are a thing of the past with Suitcase II.

And you'll never have to restart your system to install a Desk Accessory, because whatever you need will be right in your face, whenever you need it!

So why spend your time juggling fonts and DAs any longer? Now is the time to put Suitcase II on your Macintosh!
The Best Little Mac Book

Up to now, I haven’t reviewed any products, because it takes too much work, but I’ve finally found a product that was easy and fun to review. Also, the timing for doing a review is good, because this product is an ideal last-minute stocking stuffer for Macintosh owners who have, and think they know, everything. The product is a book called The Mac Is Not a Typewriter. I hope I don’t antagonize any NRA members, civil libertarians, or Apple honchos by reviewing it; I’m tired of getting hate mail.

The Mac Is Not a Typewriter is a book about how to tweak Mac documents and, according to its jacket, how to “achieve professional-quality type on your Macintosh.” Its author is Robin Williams, a teacher, consultant, and desktop publisher in Santa Rosa, California. No, she doesn’t make movies about dead poets or selling cars, and she doesn’t watch herself in reruns of “Mork and Mindy.”

If you think I gush too much about this book, let me tell you in advance that Peachpit Press, the book’s publisher, rejected my book, The Macintosh Way, so it’s not as if I’m doing a favor for a company I like.

Writing Style

It’s easy to review her book, because it is short, elegantly laid out, and delightfully unpretentious in tone. You can hear Williams softly and patiently explaining smart quotes and apostrophes, en (−) and em (−) dashes, and special characters. (I wish I could write like she does. She writes like someone playing the violin. I write like someone playing a chain saw.) This is a sample:

The accent marks are a little sneakerier than the special characters—easy, but sneaky. If you’ve ever tried to use the tilde key to type the word phatwa with the tilde over the n, you’ve noticed that it doesn’t work—you get pin-ata. That doesn’t look very intelligent.

In a mere 70 pages, Williams explains how to make your documents acceptable to Macintosh typography aficionados. Incidentally, these typography aficionados are not nearly as ubiquitous as one might think. (I just learned the word ubiquitous, so by golly, I’m going to use it everywhere.) Take a look at your manuals and the upgrade announcements from developers, and you’ll see what I mean. Most are typographically awful.

If you think you don’t need this book, take this test. If you’re too lazy to take this test, look at some of your existing documents and see if you violated these rules. (I already know you need it, so here is the book’s ISBN number to help you order it: 0-938151-31-2.)

1. How many spaces should go between sentences? (Answer: One.)
2. What’s wrong with this sentence? “Apple is going to eat IBM’s shorts.” (Answer: The quotes and apostrophe are all dumb.)
3. This sentence has three errors. What are they? “The new System shipped for what it’s worth with only 300-400 bugs.” (Answer: An em dash (Option Shift -) should replace the --, and the dash between 300 and 400 should be an en dash (Option -).)
4. True or false: Underlining is a cool way to emphasize words. (Answer: False; use italics, bold, a larger point size, or a different font.)

Here’s a complete list of the book’s topics, so you can see what you’re missing if you don’t buy it: spacing between sentences, quotation marks, apostrophes, dashes, special characters, accent marks, underlining, capitals, kerning, fonts, tabs and indents, widows and orphans, hyphenation and line breaks, leading, justified text, hanging punctuation, and serif and sans serif fonts.

Picky, Picky

There is one picayune shortcoming in Williams’ book. Although it points out the right things to do, it could also provide more information about the right way to fix them. The common scenario I foresee is that people will buy the book and want to immediately “fix” their documents.

For example, Williams could have told readers to use their word processor’s Search and Replace feature to automatically search for double spaces and replace them with single spaces. A similar technique is applicable to dumb quotation marks, dumb apostrophes, and em and en dashes.

Maybe she thought these kinds of remedies were so obvious that she didn’t have to tell her readers. I don’t think they are that obvious. I bet that Williams just never thought of it, and I hope that she’ll put this into the next version of her book.

The Dream

OK, I’ve done the obligatory “point out something negative” part of a review. Now let me explain my dream for a second version of the book. (In a product review, a dream is when a reviewer would have liked to see
Champagne taste. Beer budget. Crisp type, sparkling graphics, and a price that's easy to swallow.

Try Freedom of Press® Light with Quark XPress, PageMaker, Freehand, or Illustrator and your Apple, GCC, Hewlett Packard or other printer. Be intoxicated with the clarity. Includes 17 fonts for more enjoyment.

Buy Freedom of Press Light now and savor the pleasures of the PostScript® language.

Call us or ask your dealer for all the printers supported by Freedom of Press Light, Freedom of Press, and Freedom of Press Professional.

Custom Applications Inc. • 900 Technology Park Drive
Billericia, MA 01821 • 508-667-8585 • 800-873-4367

Freedom of Press is a registered trademark of Custom Applications Inc. PostScript is a registered trademark of Adobe Systems, Inc. Product names are registered trademarks of their manufacturers.

SUGGESTED RETAIL PRICE

$98

See us at MacWorld Expo, San Francisco

something in the current version but realizes he would be a jerk to ding the product for not having it.) Williams has admirably covered the art of Macintosh typography; now I’d like her to write a book about how the Macintosh can improve one’s writing style.

Let me explain. Ever since our English classes taught by Miss Burdbottom, we’ve all heard the rules of good grammar and word usage. However, few of us have the time, energy, or discipline to manually search for mistakes.

Now we have tools that tighten up and correct our writing. Some examples:

1. Trailing prepositions. “Reorganization after reorganization has made Apple a difficult place to work at.” Search for all instances of at, up, on, of, to, and so on. Some trailing prepositions may be unavoidable, but at least this method will help you find them so that you can decide.

2. That versus which. “That” is defining, or restrictive; which is nondefining, or nonrestrictive. Wrong: “The computer which is not being used is a PC.” Right: “The computer that is not being used is a PC.” It’s easy to go on a which hunt with a word processor’s Find feature.

3. Excessive adverbs. Many are unnecessary. “He angrily trashed Windows.” It’s difficult to see how anyone could trash Windows and not be angry. Search for ?ly (? is the wildcard character) in your word processor.

4. More excessive verbage. The ubiquitous word very usually doesn’t add (very) much to your writing. Cut it out and see if your sentence isn’t as strong — perhaps stronger. Try this with kind of and sort of. In fact, kind of should not be used to mean somewhat. The correct usage is “Macintosh is a kind of computer,” not “An IBM PC is kind of hard to use.”

You get the idea. Williams is the perfect person to explain these rules and how we can use a Mac to improve our grammar and style. I think it’s her moral duty.

The bottom line: Buy this book. Buy two so you can keep one when you give the other as that last-second Christmas gift. (It’s only $9.95.) Then write Williams and ask her to do the style and grammar book. (If you do, be sure you observe all her rules.) One more thing: If you see me breaking any of Williams’ rules, don’t point it out to me.

[Fortunately for Guy, the MacUser copy desk is able to correct the ubiquitous occurrences of grammatical and stylistic infractions. — Ed.]
Now you can travel from here to there with twice the horsepower.

Getting from your Macintosh to virtually any fax machine in the world is now a lot faster.

Because the new 9600-bps Abaton InterFax™ 24/96 gets your message across twice as fast as before. And since the InterFax software compresses the file before sending it out, you spend even less time faxing than with any other 9600-bps fax/modem.

But we didn't just double the raw output speed, we made it easier to use. We included direct scan support, so you can fax art and photos straight from the scanner with excellent resolution. We also made the software easier to use — it's as simple as printing to any printer. And we made the InterFax work in background (with or without Multifinder), so you can get back to work while your Mac faxes. You can even schedule when faxes are sent to take advantage of lower phone rates.

As an added plus, the new InterFax also works as a 2400-bps Hayes-compatible data modem with MNP5 error correction. All these features together made MacUser name the InterFax 24/96 the best communication product of 1989.

If you want to get from here to wherever with twice the horsepower, call Abaton at 1-800-444-5321 (In Canada, 1-800-663-5161) or fax a note and your business card to (415) 683-2956. The new InterFax 24/96 will make your ideas easier to publish. Anywhere.

Introducing the InterFax 24/96

Please circle 61 on reader service card.
Not an unusual claim for a 4-star restaurant. But for a monitor, it's quite a story. With NEC's multiple-frequency technology, our monitors can accept all kinds of video cards for applications ranging from standard desktop software to large-screen graphics design. And your NEC dealer has several different Macintosh-compatible MultiSync monitors he'd be glad to show you. In fact, he might even take plastic.

**MultiSync GS2A Superior gray-scale monitor, 14" flat-surface screen. Supports the Macintosh II video card and compatibles. Ideal for desktop publishing.**

**MacSync Series** Designed exclusively for Macintosh II video card and compatibles. Available in both non-glare and new high-contrast 14" screens.

_CoC_ Computers and Communications
cards accepted.

**MultiSync 3D Supports Macintosh**


**MultiSync 4D Resolution from standard Macintosh II card, 800 x 600, up to 1024 x 768. Choose your own dpi on a 16" screen. Microprocessor digital controls.**

**MultiSync 5D Resolution from Mac II card and compatibles up to 1280 x 1024 on a 20" screen for graphics design. Microprocessor digital controls.**
**Kodak XL7700**

Finally, a color printer that brings photographic quality to the Mac — albeit at a price.

When it comes to color output, Macintosh users have been like a fly trapped under a glass. Although the Mac can handle and display millions of colors — far more than the eye can discern — accurately printing those colors has been nearly impossible.

There are a few dozen color printers that do a good job of printing color type, bar charts, and simple PostScript art. But when it comes to reproducing the subtleties of a color photograph, none of them have been up to the task.

The Kodak XL7700, however, heralds a new era in color printing, with output so good that you'd be hard-pressed to tell it from the original photograph (see the examples below).

By using dye-sublimation technology, the Kodak XL7700 produces prints (bottom) that are nearly indistinguishable from the photo original seen here (at left). The highlighted areas are shown for comparison.

---

Three-Color Printing. All color printers use three primary-color dyes (cyan, yellow, and magenta) to simulate millions of colors. By laying down individual dots of these primaries, most printers fool your eye into mixing the primaries into the desired hues. This process, called *dithering*, is how all traditional printing is achieved, including every image in this magazine.

The XL7700 doesn't have to fool the eye, because it uses the latest development in color printing: *dye sublimation*. Instead of laying down individual dots of colors, the XL7700 heats the cyan, yellow, and magenta dye layers on its ribbon into a gas. The gaseous dyes are then blended into a true color and placed on the paper.

The prints look like photographs because the XL7700 prints are *continuous-tone*, meaning that the colors have a range of intensities. Dithering printers simulate ranges of hues and intensities with patterns of color dots.

What's amazing about the image quality of an XL7700 print is the fact that it's only 200 dpi. But because the XL7700 doesn't dither, it doesn't lose resolution to create its colors. To the naked eye, the XL7700's prints look better than any image in this magazine.

**Printing Process.** I used an Adobe Photoshop plug-in driver for the XL7700. During testing, the Photoshop driver was the only software available for the XL7700, so I could print only images that opened with Photoshop. Fortunately, Photoshop can open virtually every file format, but a PostScript solution is lacking. The XL7700 is primarily for printing continuous-tone photos and images, but Kodak must address PostScript as well.

At press time, two third-party drivers had been released and a few more were waiting in the wings. CAI now offers a driver for the XL7700 in Freedom of Press Professional, which lists for $1,295. Media Publishing Group offers a Mac-based software RIP, written by Knowledge Software, called Magic Rip, which prints directly from several of the top graphics applications, including QuarkXPress 3.0, Adobe Illustrator, and Aldus FreeHand. Kodak also announced plans to develop its own hardware PostScript RIP, complete with an Ethernet connection.

Because the XL7700 doesn't dither, you are able to use the full resolution of...
XL7700's prints look much sharper, thanks to continuous-tone technology. Kodak's XL7700 is a rugged piece of rack-mountable equipment that produces the best color prints you've ever seen. Even though its actual resolution is 200 dpi, the Kodak XL7700's prints look much sharper, thanks to continuous-tone technology.

At a starting price of about $25,000, and with high media costs noted earlier, the XL7700 is clearly not going to be your everyday printer of choice. In fact, the XL7700 is best used in conjunction with a more conventional, thermal color printer. The thermal printer has the advantage of being less expensive to purchase and operate, so you can use it for making quick color checks and reserve the Kodak unit for final color proofs. Considering how much conventional color proofing can cost, the XL7700's initially high price tag may prove economical in the long run — especially for companies that do a lot of color work. The Kodak XL7700 signals a new standard for color printing and urges Macintosh users into the world of true color.

— Paul Yi

Get Info

Kodak XL7700

Manufactured by: Eastman Kodak, 343 State Street, Rochester, NY 14650; (800) 445-6325.
List Price: $24,895.

Apple Seeking Japanese Partners?

TOKYO, JAPAN — Responding to the increasing importance of global markets, Apple Computer executives broadly hinted that Apple may soon form a formal relationship with Sony. At the first Apple board of directors' meeting held in Japan, Apple CEO John Sculley stressed the importance of international markets and hinted that Apple may look favorably on a Japanese business partner. Reports coming out of the meeting strongly suggested that one of the first results of an Apple/Sony teaming would be that Sony would manufacture a low-cost "notebook" Mac that Apple would design and sell. Although no formal announcement was made, both Sculley and CEO Mike Spindler acknowledged that there are no more "sacred cows" at Apple, which suggests that Apple may license its Macintosh technology to Sony as part of the new portable deal. Shortly after news of the Sony negotiations circulated, a similar story involving Toshiba surfaced. Apple has never used an outside manufacturer for its computers.

Gassée to Be:

SAN MATEO, CA — Less than a week after his formal departure from Apple Computer, Jean-Louis Gassée, the flamboyant former president of Apple Products, has resurfaced with a new partnership with Be Labs, Inc. Gassée is the sole financier of Be Labs and has issued statements about what the company plans to manufacture or when its products will come to market.

Gassee to Be:

SAN MATEO, CA — Less than a week after his formal departure from Apple Computer, Jean-Louis Gassée, the flamboyant former president of Apple Products, has resurfaced with a new partnership with Be Labs, Inc. Gassée is the sole financier of Be Labs and has issued statements about what the company plans to manufacture or when its products will come to market.

LaserJet Warning

PALO ALTO, CA — Users of the Hewlett-Packard LaserJet II P should be aware of a U.S.-only toll-free number, (800) 233-5153, for advice on faulty power supplies. Approximately 70,000 of the first II P's manufactured may have power supplies that need repair, and the company is urging its customers to call and find out if they have a bad machine. HP says that the power supplies pose no safety hazard but that the control panel will flash the message "50 Needs Service," which prevents the printer from operating. Users with bad power supplies can either have the printer repaired free or can return the unit to HP for a remanufactured replacement.
CheckFree®
Electronically Pays All Your Bills
And Automates Your Recordkeeping.
No Checks, No Stamps, No Paperwork.

Specially Designed for The Macintosh.®
For the first time, Macintosh users can experience the speed, convenience, and simplicity of paying bills the CheckFree way. Now you'll discover that CheckFree is the superior bill-paying solution.

It Couldn't Be Easier.
All you do is enter payment information, and CheckFree software automatically records, categorizes, and sends the information to the CheckFree Processing Center via modem. Payments are then processed through the Federal Reserve System—the same system that banks use to clear your checks today. Fixed, recurring payments (such as mortgages) can be made automatically; once they're set up, you never have to bother with them again.

Pay Anyone Through Any Bank.
You can pay anyone with Check Free because the CheckFree Processing Center utilizes electronic transfers as well as laser printed checks to make payments. If a company or individual you are paying is not set up for electronic payments, the CheckFree Processing Center will print and mail a laser printed check for you. Because of its universal payment processing technology, CheckFree can process payments to anyone in the U.S. through the checking account you already have at any bank, credit union, or savings and loan.

No Loss Of Float.
You tell the CheckFree software when you want your bills paid and the CheckFree system pays them on the dates you specify. All we need is a few days advance notice to make sure your payments get processed on time.

Saves Time, Paperwork, And Money.
Your bill paying and other routine financial activities can be reduced to just a few minutes. Paperwork becomes virtually non-existent. Plus, the CheckFree service is only $9.00 per month—not much when you consider the savings in postage, bank charges, and late fees.

Organizes Your Finances.
CheckFree gives you a completely automated checking account register that updates automatically with each transaction. You can also record deposits or other non-CheckFree transactions. Bookkeeping is virtually automatic. There's an easy-to-use package of income, expense, and budget reports that keeps you constantly aware of what's coming in and what's going out. Plus, you can export CheckFree data to Excel® and MacIntefx®.

Completely Secure.
CheckFree is more secure than conventional check writing. Payments are processed through the Federal Reserve System, so CheckFree never requires access to your account. Only you have access to your funds and only you authorize payments.

Backed By The Nation's Leader In Electronic Payment Services.
CheckFree has been the leader in electronic payment processing since 1981, with current payment volume exceeding $1,000,000,000 annually.

Used By Thousands All Over The U.S.
See what experts have to say:

"The CheckFree electronic bill-paying service belongs to that rare class of product that is forward-looking, universally useful, and available today."
—PC Magazine, Best of 1989 Awards
January 16, 1990 issue

Call 1-800-882-5280
CheckFree

PC Magazine, Best of 1989 Awards
January 16, 1990 issue

CheckFree makes bill paying a quick, painless task rather than a monthly ritual to be dreaded...

CheckFree Corporation has been handling commercial electronic payments for companies such as CompuServe® for years, and its experience and professionalism showed in all aspects of my dealings with it.
—PC Magazine

"...CheckFree did not fail me. When my banking statement arrived the first thing to catch my eye was a CheckFree check...this laser-printed paper check was reassuring that someone else could be trusted to pay my bills..."
—Robert Cullen, Home Office Computing

Now that you know all about CheckFree, why would you pay your bills and handle your finances any other way? Why would you burden yourself with checks, stamps, and paperwork while your Macintosh® sits idly by? Besides, when you order by phone or mail, CheckFree comes with a money back guarantee. If you're not completely satisfied with CheckFree software, simply return it within 30 days of purchase for a full refund. You've got nothing to lose.

So order today. Call
1-800-882-5280
(ов)day through Friday from 9AM to 7PM EST)
or send $29.95 (plus $4 shipping and handling) to:
CheckFree Software
P.O. Box 897
Columbus, OH 43210

CheckFree is also available at leading retailers including Egghead Discount Software®, Electronics Boutique®, Babbage® and MediaFriend® Software. And Soft Warehouse®.

CheckFree Corporation is a registered trademark of CheckFree Corporation. All other trademarks are the property of their respective corporations.

Client Support: free access via Email. Hardware Requirements: Macintosh® 128K or higher, 800K drive and a Hayes® compatible modem. (Limitations: Over 30 monthly transactions involve a nominal surcharge ($3 per ten payments or portion thereof). CheckFree is a registered trademark of CheckFree Corporation. All other trademarks are the property of their respective corporations.

Copyright © 1989, 1990 CheckFree Corporation. All rights reserved. Reprinted from the Mac issue of Home Office Computing.
Databases

4D Compiler

ACIUS' compiler is the speed fix 4th Dimension has been waiting for.

Lack of speed has been the bane of 4th Dimension's existence ever since its initial release. Version 2.0's speed improvements took the program from the pedestrian to the airborne, however, and the new 4D Compiler takes the package into hyperspace.

Compiled, Not Interpreted. With an uncompiled 4D application, the Mac actually spends more time converting your code into machine language than it does performing tasks. Languages that perform this stepwise conversion are called interpreted. The 4D Compiler preorganizes your application into machine language, bypassing the interpreter and thus speeding up the application.

The 4D Compiler strips out everything you can read from your application, including the design environment. It creates and works on a copy of your database: your original source file is left intact. Whenever you make changes to the source file, you can recompile as needed. The compiler doesn't touch your data, and you can use the same data file simultaneously with a compiled and an uncompiled structure.

Compiling does not speed up disk- or network-access operations, only user-defined procedures. A routine that loops through an array and changes the values of variables shows a dramatic performance improvement, but a routine that loops through and updates records in the current selection is not significantly faster. You can probably see some improvement in the redraw times for output layouts that contain a layout procedure.

Using the compiler to develop a database requires more consistency than developing for the interpreter. For example, the interpreter lets you assign 0 to a variable called vTemp in one place and A to vTemp in a different place, but the compiler doesn't. The compiler will complain if you try to redefine variables. Generally, you won't produce a compiled application on your first try, but the 4D Compiler provides a wealth of information as it attempts to convert your application. To help trace your mistakes, the 4D Compiler can optionally generate a symbol table and an error file. These two diagnostic tools greatly simplify the process of making an application compiler-ready.

The symbol table tells you where the compiler first defined every global variable in your application and gives you the variables' data types. It also describes all the local variables and parameters associated with procedures and functions. The symbol table can tell you a lot about how tidily you use variables and more.

You can open and print the error file with a word processor, or you can use it in conjunction with 4D's design environment. When 4D sees an error file in the same folder with your structure file, it opens the error file and installs new menu items on the Use menu. The Next Compiler Error command opens each offending procedure and script and highlights the troublesome line.

The Range Checking option handles mistakes such as indirect reference to the 100th element of an array that has only 25 elements. Without range checking, your compiled application would simply crash rather than putting up a courteous error message. Range checking slows your compiled application, so you should add your own range-checking statements with an eye toward turning off Range Checking at some point.

You can set the compiler for script-manager compatibility to support writing forms such as Kanji. The Processor Type choice can further optimize certain routines by tailoring them for specific 68000-family processors.

You can now blend 4D Runtime into your compiled application, creating a double-clickable application, with your own icons. This feature should make "4th party" developers salivate. A new 4D 2.1 command, Set About, lets you specify the text for the About menu item on the Apple menu and the routine that runs when that item is chosen. A 30-pixel region at the top of your About box tells...
Buy our Mac-compatible color printer and get this IBM-compatible color printer free.

Introducing the new Phaser PX Color Printer from Tektronix. It's the first color printer you can hook up to Macs, PCs and workstations. At the same time. And for a mere $7995, you'll get all the features you could possibly want. Like PostScript-language compatibility. Brilliant thermal-wax color at 300 dpi. And certified PANTONE® Color. No other printer offers so much for so little.

Call 1-800-835-6100, Dept. 11A to find out more about the new Tektronix Phaser PX—the color printer anyone can use.

The New *Tektronix Phaser PX*

*Pantone, Inc.'s check-standard trademark for color reproduction and color reproduction materials. Phaser is a trademark of Tektronix, Inc. Copyright © 1990 Tektronix, Inc. All rights reserved.

Please circle 41 on reader service card.

the user that the application was created with 4D: Everything else about your application is your own.

The 4D Compiler lets you create a project file that remembers your compiler setup options and your source file. You can double-click on the project file and get right to compiling.

The compiler and 4D both make good use of the Mac RAM cache, and they work very well under MultiFinder. Compile times can be dramatically reduced with the RAM cache turned on. You can also get work done in another application while the 4D Compiler chugs along on your 4D project.

I often run 4D 2.1, the 4D Compiler, and Word simultaneously. That way, I can step between errors, recompile at will, and review the symbol table as needed. Word's Open Read Only option is handy—you don't have to worry about the compiler finding the symbol table busy!

The compiler has a couple of quirks I would like to see changed. The Next Compiler Error command does not handle general errors. You'll want to keep the compiler open or print the error file to locate and fix those errors. Also, Next Compiler Error doesn't skip warnings. Although errors prevent the compiler from creating a compiled structure file, warnings are not necessarily a problem.

General errors can prevent the 4D Compiler from compiling your project, so you're likely to be confounded when the error count increases after you've fixed the general errors. Sometimes, the compiler error message simply reads “Syntax Error” — not a particularly enlightening message. If an error occurs that's caused when a parameter of the wrong type is passed to a procedure or function, the compiler doesn't tell you which is the offending parameter.

It's a good strategy to recompile fairly frequently. This provides the ego feedback of seeing the error count drop and keeps the error information current. If you've got 200 errors, don't slog through them all at once. Changing one line of code can sometimes wipe out five errors. As you fix problems, the Next Compiler Error command continues to take you to related errors that have been fixed.

Unfortunately, the 4D Compiler is copy-protected. It asks for the key disk on the first launch after any install and asks for the disk again randomly (roughly once every 40 launches). If you're using
the 4D Compiler at home and at work, the only safe method of operation is to carry the key disk with you, which means a higher probability of corruption. With key-disk protection, there really isn’t much you can do to protect yourself from being accidentally locked out at a crucial moment.

The Bottom Line. At a list price of $1,000, the 4D Compiler isn’t a product that most users are going to rush out and buy — much less use. This is a serious developer’s tool. But it would be wrong to assume that the 4D Compiler will have no impact on average users. With the spate of new 4D-based applications that are sure to emerge as a result of the compiler’s release, users who otherwise might never even consider looking at 4th Dimension may find themselves becoming productive using a 4D application. Who knows — the 4D Compiler may finally help give the Mac the one thing it has always lacked: a de facto relational-database standard. It’s interesting to watch 4D evolve, incorporating what is clearly user-inspired features. The 4D Compiler and 4D 2.1 provide a sophisticated development environment that begins to rival language tools but does not require the skills of a MacApp developer to master. In a way, the compiler has completely stolen the show from 4D. This package is more important than just about any other 4D-related tool I’ve seen so far. If you’re serious about 4th Dimension development, you can’t afford to miss it.

— Louis E. Benjamin, Jr.

Get Info

4D Compiler

Published by: ACIUS, 10351 Bubb Road, Cupertino, CA 95014; (408) 252-4444.
Version: 1.0.
List Price: $1,000; registered-developer price, $700.

Why Sensible Grammar™ is first in its class.

Now anything you write, from a business letter to an annual report, can be stronger and clearer. With Sensible Grammar™, a professional proofreading program that uses artificial intelligence to check your punctuation, usage, phraseology and more.
Sensible Grammar scans your work for potential errors and automatically displays the sentences in which they appear. It explains what’s wrong and even suggests corrections. Making changes is easy — a simple click of the mouse, and you can do anything from inserting proper punctuation to rewriting entire sentences using the built-in sentence editor. And your formatting information remains unaffected.
Sensible Grammar compares your text against a library of over 4,500 phrases to identify informal, vague, racist, sexist and other faulty language. It catches embarrassing typographical errors like mistyped capitalization and repeated words, and alerts you to mismatched verbs and pronouns, needlessly long sentences and more. It even provides a readability analysis.

Sensible Grammar works with WordPerfect, Microsoft Word, Works, and Write, Apple/Claris MacWrite and MacWrite II, TMaker Write/Now and text files. And it costs just $99.95.
So get Sensible Grammar. And be the most effective communicator you can be.

Also available: Bookends™, the reference management database and bibliography preparation system ($99.95).

Sensible Software, Inc.
335 East Big Beaver, Suite 207
Troy, MI 48083
(313) 528-1950

Please circle 33 on reader service card.
Our valued customers think so. The experts agree. Let them tell you why.

**Higher Quality and reliability.** "Just a quick note to let you know how sturdy your hard drives are. I am a Navy A-6 pilot. Early this year I purchased a hard drive from you. I forgot to pack it with my Mac for shipment to the carrier before leaving on deployment for the Western Pacific Ocean region. As a result I had to stick it under the rudder pedal of my A-6 for the flight out to the boat. Just thought you'd like to know that your drive logged about 5 hours of flight time and 5 carrier landings and has worked flawlessly since. Not bad eh?"

Lt. Carl Oesterle, Navy A-6 pilot

"La Cie drives are the most reliable and convenient disks I've ever had." James J. Haf, Lansing, MI

"The best survival history of any drive purchased... quietest and most portable." Al Forster, Dow Chemical

**The experts agree.** "La Cie combines the lowest price, the best performance, the most flexible software and they pay good attention to support and hardware details." Macweek, January 1990

Designer's Choice Award - Industrial Design Review
Bronze Award - America's Industrial Design Excellence

**Excellent service and support.** "I now know why my friends suggested I buy La Cie, their backup and support was exceptionally good. Not only did La Cie provide intelligent articulate instruction and advice but they even called back to learn of my progress." Richard Woudenberg, Ridgewood, NJ

"Perhaps you can take satisfaction in knowing that your dedicated users are appreciative of the quality you put into your product and the service with which you back it up." Dr. David J. Hibler, Lincoln NB

"When I called La Cie, I was told someone would call me back. Would you believe after a few minutes, they called back?! Other calls I had made previously to La Cie were also returned promptly. The customer service and technical support people were patient and friendly." Rick Monteverde, Honolulu, HI

**The experts agree.** "Service star La Cie has up to a five year warranty, toll free support and guaranteed turnaround time for repairs. La Cie comes out on top in service and support." Macworld, June 1990

---

Tsunami actual size including universal power supply, silent fan and external termination switch.
Increased performance. "I love your Tsunami drive! It's fast, quiet, small and light and I can't emphasize how wonderful it is to turn the termination on and off. Of course, it doesn't hurt that you bundle Silverlining with it—the universal formatter with no competition that I know." Johnathan Braun, Palo Alto, CA

The experts agree. "La Cie offers the leading combination of software and performance." Macworld, March 1990

MacUser Labs show that La Cie drives are at the top of the pack in raw speed, best real-world performance, coolest temperature, quietest noise, and longest warranty (five years). MacUser, February 1990

More value and productivity. "My productivity has increased at least three-fold. My La Cie drive has performed beautifully. It is really fast, quiet and the documentation is very clear. When I had a question and called, I got a friendly, helpful person who really took the time to explain what I needed to know. This sounds like a testimonial. Yep, I guess it is. Thanks for giving such great value." Craig Turner, Chapel Hill, NC

"I create advertisements for movies. La Cie's Silverscanner has enabled us to sell a lot more jobs! Two thumbs up!" Dave Works, Los Angeles, CA

"I love these drives. The size is perfect, the response time is great, these are the best drives money can buy. I have searched and compared price, quality and performance with other products. La Cie is the best." Edwin E. Rivera-Juan, Hato-rey, PR

The experts agree. "If you are value conscious you'll be hard pressed to beat La Cie." Macworld, November 1990

"La Cie's longer warranties truly represent a good deal. The king of consumer choice." Macworld Sept. 1990

Since 1985 La Cie has offered you more benefits, quality, service and value than any other manufacturer. The experts and customers agree.

"I love this drive." David Kennedy, B.C. Canada. Call to order.

800 999-0143

Please circle 414 on reader service card.
Aldus PrePrint

Aldus PrePrint is the best color-separation utility for PageMaker, even though it still has a few bugs. To help create optimal separations, PrePrint includes some image-control functionality. You can see the impact of the Auto Enhance function in a before (left) and after (right) view.

When DTP output meant only laser-printed quality, PageMaker alone was enough. But now that the DTP envelope has been pushed all the way to full-color prepress, Aldus has released Aldus PrePrint, a utility that has only one purpose: to produce color separations.

Printing and PrePrint. Because PageMaker Color Extension and PageMaker 4.0 are as yet the only applications that support PrePrint’s full functionality, I’ll include them in this discussion of PrePrint. When you use PrePrint, the first step is to create a PostScript file with OPI (Aldus’ Open Prepress Interface) comments that conform to Adobe color-separation conventions. When you’re ready to separate, use the Print dialog box to select the printer your separations are to be printed to. Choose the Print PostScript to Disk option, with the For Separations radio button selected. PageMaker then creates an OPI file with the .SEP extension.

PrePrint’s primary window feels strange. When you first open a separated file, PrePrint finds the linked TIFF and MacPaint files, opens the images, and displays the primary window. This small window displays the names and locations of the different images in your document. You can select the images individually and mask those that need to be separated conventionally. But recreating a display from a PostScript file requires Adobe’s Display PostScript, which Apple doesn’t license. Images display, fortunately, and you can add minor enhancements to them, but PrePrint is no Photoshop.

Better Pictures. PrePrint’s image enhancement is basic but adequate for a color-separation program. A printed color image is essentially a combination of four superimposed half-tones. Images can be divided into three assemblages: darker tones are grouped as shadows, lighter tones are highlights, and the tones in the middle are called midtones. PrePrint lets you achieve various effects by manipulating shadows, highlights, or midtones. It also provides some global image controls. You can soften or sharpen an image.
Look Before You Weep

Only the Mobius One Page Display offers Zenith quality and built-in acceleration for just $795, complete.

Now you can afford to view an entire page of text or graphics, without wasting time scrolling or waiting for your screen to keep up with you. Only Mobius gives you image quality in the same league as Radius™, plus built-in acceleration for only $795. Complete with monitor, card, software, cables, and a precision tilt/swivel base. Unlike other displays at this price, the Mobius One Page is custom built by Zenith, the leading monitor supplier for the Macintosh market. Your page will appear razor sharp on the high-contrast, polished tube. But that's only half the picture.

The Mobius One Page Display pushes your SE to twice its normal operating speed with its built-in 16 MHz Accelerator. Which means you'll see your software run up to two times faster. At no extra cost.

It's easy to order a Mobius One Page Display. Just call us toll-free 800-669-0556. We welcome your Mastercard, Visa, American Express or corporate P.O. Every display comes with a full one year warranty backed by Zenith, plus a 30 day money-back guarantee. Installation is easier than adding memory. Our ExpertService™ provides unlimited toll-free support and immediate warranty replacements. At no extra cost.

To Order Call 800-669-0556

Mobius Technologies, Inc.

Please circle 67 on reader service card.
Why StatView is the #1 selling statistics package for the Macintosh.

With StatView II® or StatView SE+Graphics, you can perform a large variety of descriptive and comparative statistical operations at mainframe speeds.

And StatView has presentation color graphics that rival the best of the graphing and drawing programs on the Macintosh.

Now you can manage and analyze your data and then present your results all in one program. And when you consider the power of these features in a single package, it's easy to see why the StatView line is the three-time winner of the Macworld World Class Award for Best Statistics Program.

SuperANOVA — general linear modeling made accessible ... finally.

A perfect companion to StatView, SuperANOVA™ is the definitive program for general linear modeling.

Ideal for researchers and engineers, SuperANOVA allows you to easily perform ANOVA, ANCOVA, MANOVA, MANCOVA, repeated measures, and regression on your data.

And like StatView, SuperANOVA gives you all the tools you need to present your results.

That's why SuperANOVA is the winner of the 1989 MacUser Editors' Choice Award for Best New Data Analysis Product.

Find out more ...

For more information on StatView and SuperANOVA, or for a free demo kit, call Abacus Concepts at 1-800-666-STAT and ask for Carole Kester.

ABACUS CONCEPTS
1984 Bonita Avenue, Berkeley, CA 94704
(415) 540-1949

StatView and SuperANOVA run on the Macintosh Plus, SE, Classic, Portable, SE/30, LC, II, IIfx, IIfx, IIfx, and IIfx. StatView is a registered trademark and SuperANOVA is a trademark of Abacus Concepts, Inc. All other brand and product names are trademarks or registered trademarks of their respective holders.

and change the saturation and lightness.

Another noteworthy feature is PrePrint's ability to adjust contrast by globally changing the difference between light and dark pixels. Auto-balance is useful for images that have an overall cast, but it can be disastrous to images that have no neutral areas.

From PrePrint to Print. The Print dialog box is the heart of PrePrint; it has two related printing dialog boxes — Print Options and Press Controls.

The Print dialog box gives you the option of printing an image as color/gray scale or as monochromatic. You can also print separations or a composite of the image. Printing separations is the default for color TIFF and OPI files.

Selecting the Options button takes you to the next dialog box, Print Options, which is where you choose the printer type. Choosing a printer also selects the right PPD (PostScript-Printer Description) and PDX (Printer-Description Extension) files. PPD files, published by Adobe, carry the optimal screen angles and frequencies that reduce moirés. PDX files were created by Aldus to improve PPDs. They provide information, such as specific densities for screen tints, that is not provided by PPDs. It can make the difference between good and so-so separations.

Once you've selected an ink, PrePrint gets the optimized screen angle and frequency information from the PPD file to display in the Angle and Ruling boxes. If you are adventurous, you can change these to your liking.

PrePrint also lets you print your image as either a negative or a positive, with the emulsion up or down. Every printing house has a preference, so a phone call beforehand can save you time and money.

Selecting the Printer Marks option prints crop marks, registration marks, the filename, the ink name, the page number, and the date. If an image is too big to fit on your page, PrePrint rotates the separations 90 degrees. If your final output device is not available, you can use the Print to Disk option. PrePrint then creates an ASCII file with images represented in binary code (you can output a hexadecimal representation if you hold the Shift key down when issuing the Print command).

The Press button takes you to the Press Controls dialog box, where you select the optimal configuration for the paper stock you want to use for final printing.

Please circle 139 on reader service card.
PrePrint Problems. PrePrint does justice to TIFF and true EPS files, but results with PICT, PICT2, and non-conforming EPS files are unpredictable. Aldus recommends that these files be converted to EPS or TIFF before you import them into PageMaker.

Another problem is that PrePrint prints all its color separations one after another, so all the magenta separations are output together, all the cyans, and so on. This may cause registration problems. A workaround is to print only one page at a time. Aldus and at least one third-party vendor are working to fix this problem. PrePrint represents black with the three process colors, which increases the chance for moirés.

Division of labor between PostScript service bureaus and desktop publishers is still being worked out, so whether PrePrint is right for you will depend on your relationship with your service bureau. Service bureaus that are primarily output centers don’t like the extra work involved in creating PageMaker color separations. Customers who work with these service bureaus are better off creating their own PostScript files. This way the service bureau has only to open the PostScript files in PrePrint and output them. Service bureaus that provide a range of prepress services have imagesetters as just a small part of their overall services. These bureaus are only too happy to take your PageMaker pages, create PostScript files, and output them through PrePrint. Professional publishers are generally better off with bureaus of this kind.

The Bottom Line. Overall, PrePrint is an excellent production tool for color separations. My favorite separation program for PageMaker used to be Adobe Separator. No longer, though, because PrePrint gives consistently better separations for PageMaker documents than any other program does.

— Jim Quraishi

High Performance Storage Products For Power Users

MacWeek, MacWorld, MacUser, and InfoWorld agree: HAMMER™ is the leader in performance, speed, and value.

We build the finest high capacity drives available. Our products are extremely reliable, ultra-fast (through our proprietary HDToolKit™ system software), and represent superior value. Every product we offer is loaded with versatile high performance utility software and is backed by our long standing commitment to customer service.

• Internal and external hard drives
• Erasable magneto-optical cartridge drives
• Removable cartridge drives
• Tape and DAT backup systems
• Disk duplexing and mirroring
• Modular storage systems

All drives are fully AppleShare™ and A/UX™ 2.0 compatible. For information and the Hammer dealer nearest you, call FWB™ at 415/474-8055 or FAX us at 415/775-2125. Please circle 8 on reader service card.

Get Info

Aldus PrePrint

Published by: Aldus, 411 First Avenue S., Seattle, WA 98104; (800) 638-5078 or (206) 628-2320.
Version: 1.0.
List Price: $495.
Introducing EZ Vision, MIDI* software for recording and editing music. Have fun! Enhance presentations! Sound like a pro!

EZ Vision Only $149!

EZ Vision turns your Mac into a recordable "player piano." With any MIDI synthesizer and a MIDI interface, you can record up to 16 instrument parts. If you play a wrong note, click on the note and change its pitch! Change trumpets to violins. Even record parts slowly then speed up the music! Use auto-correct to shift the beat! Easy!

What You Need

- EZ Vision—$149
- MIDI synthesizer keyboard or module (like Roland's CM-32L)
- Opcode's MIDI Translator™ interface—$69!
- Mac Plus, SE, or any in the Mac II family

Also Available From Opcode

MIDIplay™—play MIDI from HyperCard, Director & more; Music Clips™—original MIDI files; Book of MIDI—interactive software for learning MIDI. Call for prices.

Get into making your own music on the Mac today! Call (415) 369-8131 for details.

OP CODE

3641 Haven Drive, Suite A Menlo Park, CA 94025-1010

*Musical Instrument Digital Interface

Trademarks: EZ Vision, MIDI Translator, MIDIplay, Music Clips, Opcode Systems, Inc.; Macintosh, Apple Computer, Inc.

Please circle 404 on reader service card.

January 1991 MacUser
The freedom to write and think is for all of us. Now, there is a new word processor that’s just right for us, too. It’s called MacWrite® II, and it’s made by Claris. MacWrite II makes it possible to share your ideas and thoughts with other computers and word processors. You’ll be free to open documents from over 50 word processors, on all kinds of computers, with all kinds of speech, and work on them without reformatting.

But there’s more you can do. (The feature is called XTND.) You can import graphics, not only from Macs, but many computers, guaranteed. And you can scale and crop them, one and all, in your MacWrite II document. In short, MacWrite II with XTND is a powerful word processor that lets you freely exchange text and graphics. You’ll find also that your MacWrite II lets you change fonts, styles, sizes and colors, as well as text with its find/change feature. And you can create custom styles and save them as stationery — with all formats preset. You’ll share your reports and letters quickly.

But what good is freedom of expression if you find your editing to be a hassle? That’s why the page layout and editing is fully WYSIWYG: the thoughts you see are the thoughts you get. This WYSIWYG feature, by the way, is found only with MacWrite II. It’s another way Claris simplifies word processing for you, whether you’re 52, 22, or 72.

Called upon daily MacWrite II smooths your writing assignments and other chores. There’s MacWrite II spell checking, for example, and foreign dictionary programs that are optional, and a host of other features that come standard. (Like a thesaurus, and a mail merge feature you’ll discover saves lots of time.)

What it adds up to, you’ll find, is a simple and powerful tool designed for people. All the people. It is for writers, and it is for business people. And it is for those of us in between. The freedom to write is liberating. Now technology is, too.
All video display terminals (VDTs) emit electromagnetic radiation (EMR) through the screen. The photo on the left is a visualization of EMR in red from the screen. The photo on the right shows that the NoRad Shield™ virtually eliminates screen-emitted E-Field EMR and better than half of the high frequency magnetic EMR.*

No Rad
Radiation Shield
No One Comes Close

**SHIELDING TECHNOLOGY COMPARISON TO 1 GHz**

- **CARBON MESH**
- **GLASS/ACRYLIC**
- **NoRad Shield™**

Figures are based on independent lab tests conducted to Military Specification MIL-STD 285 of the NoRad Shield™ and other commercially available radiation-blocking screens.

No other VDT screen comes close to the NoRad Shield™ when you're talking about blocking electromagnetic radiation (EMR). If you're thinking of buying a radiation shield, consider the facts:

- Only the NoRad Shield™ blocks virtually all E-Field EMR*
- Only the NoRad Shield™ blocks magnetic EMR*
- And, the NoRad Shield™ discharges the static field while eliminating glare and reflections.

The NoRad Shield™ — simply the best radiation shield available. Compare and you'll see that no one else even comes close. Call for free product information.

- Easy to install
- Color or monochrome
- Available in sizes to fit virtually all monitors, displays and terminals

NoRad
800-624-8999 Ext. 498
NoRad Corporation 1549 11th St.
Santa Monica, CA 90401 213-395-0800

CANADA: ECLECTIC PRODUCTS
604-624-5168

*99.9999% electric field attenuation from 20 KHz to 1 GHz.
*Greater than 50% magnetic field attenuation above 30 KHz.

NoRad Shield™ is a trademark of NoRad Corporation.

Please circle 104 on reader service card.
Menu commands specify the case of selected text: lowercase, uppercase, the opposite of what it is currently specified, and word or sentence capitalization. A feature unique to DeskWrite is its ability to print a document to the Clipboard. If you paste the document into a graphics program and save it as a PICT or TIFF file, you can share it with others who don’t have DeskWrite.

DeskWrite documents accept any graphic pasted from the Clipboard. When you resize a graphic by dragging, DeskWrite interactively displays the image’s current percentage relative to the original size. You can reposition and even overlap graphics by dragging them. Like a drawing program, DeskWrite has Bring to Front and Send to Back commands to control how graphics overlap. There are text-wrap and standoff-distance controls, but all graphics automatically paste as rectangles, so there is no way to wrap text around irregularly shaped graphics.

DeskWrite prints mail-merged letters, using data from a DeskFile database. Both the database and the DeskWrite document must be open together, and for each database field you want to include, you must enclose its exact field name in international quotes («»). Mail-merging is much easier in Works, because you select the fields you wish to merge from a window; there is nothing to remember or type.

**Appointments.** DeskSecretary reminds you of upcoming events. You enter the text that your Mac is to display at a future time and enter the date and time it should appear. You can optionally instruct DeskSecretary to remind you in advance of the event, to give you time to get to your appointment. A reminder can be set to repeat hourly, daily, weekly, every two weeks, monthly, quarterly, or yearly. As long as your Mac is on, a dialog box with your reminder will appear, at the specified time, on top of whatever application you’re currently running. If your Mac is off, the alert will appear immediately the next time you boot up. You can just acknowledge the reminder (deleting it) or tell DeskSecretary to remind you again later. Repeating reminders are automatically reset to their next interval.

DeskSecretary does a wonderful job of mimicking JAM Software’s Smart Alarms, but the improved Smart Alarms version 3.0 and CE Software’s Alarming Events are both better schedule keepers than DeskSecretary.

**Communication.** DeskCom is a basic communications program that is similar to the original MockTerminal DA. It sends and receives either text or Xmodem files in the background, with or without MultiFinder. Contemporary file-transfer protocols such as Xmodem/1K blocks, Ymodem, and Zmodem are not supported. DeskCom stores as many as nine phone numbers, each with its own settings. If it senses a busy signal, it will redial repeatedly until a connection is made. Its simplicity makes it ideal for users who are new to telecommunicating. There is, however, no macro or scripting language to automate log-on, password entry, and downloading of E-mail and new files—features you find in heavyweights such as White Knight, Smartcom, and MicroPhone.

**Numbers.** The DeskCalc worksheet encompasses 1,000 columns by 2,048 rows. It provides 45 formula functions. There are no macro or scripting capabilities, but it provides enough power to satisfy most users. DeskCalc’s operation DeskCalc may not be in the same category as Excel or WingZ, but it has enough functionality for most users. It isn’t as good as the spreadsheet program in Works, however, and not being able to open more than one spreadsheet at a time is a serious handicap.
Tuu could have the pleasure of
and capabilities are roughly equivalent to
those of Works’ spreadsheet program,
but DeskCalc runs slower and can open
only one spreadsheet at a time.

Data. DeskFile is a disappointing data
base manager. Although you can create
as many as 250 fields per record and
10,000 records per file, only four field
types are supported: text (up to 250
characters), numeric, picture, and long
text (up to 32K). Date and calculated
fields are not supported, and you can open
only one file at a time. Although
DeskFile can sort database files on up to
three fields, each in ascending or de-
skewing order, it sorts and searches only
on the text and numeric fields. You can’t
locate a phrase you entered in a long text
field.

In testing DeskFile, I duplicated a user-
group membership list and a sales-record
database I’ve kept in either Works or
Preferred Publisher’s DAtabase DA.
DeskFile could not properly sort mem-
bers in the membership list by their re-
newal date. Those whose renewal dates
fell in October, November, and Decem-
ber were sorted between January and
February, because the numeric equiva-
lent for those months begins with 1, which
is less than February’s 2. If DeskFile
supported date fields, this problem would
never have occurred. In the sales database,
the lack of calculated fields prevented
DeskFile from multiplying a quantity of
time by an hourly rate or subtotaling the
prices of several items and computing the
sales tax and total.

There are some nice things about
DeskFile. Three views are supported:
form (a separate index card for each
entry), list (a spreadsheet-like listing), and
label (for mailing). You needn’t mail-
merge to a word processor to print mail-
ing labels — DeskFile does it directly.
Unlike in Works, entries wrap to the
current width of the field and text fields
can be multiple lines. You can customize
the form and mailing-label views, using
DeskDraw. DeskFile’s ability to accept
any graphic from the Clipboard lets it
serve as a substitute for the Scrapbook.

The Bottom Line. Even though
DeskPaint, DeskDraw, and DeskWrite
justify the price you’d pay for Desk, I still
prefer Works as an integrated package.
As a second-generation product, Works
achieves its strength through the close
integration and matched capabilities of
its modules. Desk is a collection of seven
variable-quality DAs, none of which in-
tegrates with the others as well as Works’
modules do with each other. Also,
DeskCalc and DeskFile need serious
overhauls before they’ll be useful.

— Darryl Lewis

Get Info

Desk

1.0
Published by: Zedcor, 4500 E.
Speedway, Suite 22, Tucson, AZ
85712. (602) 881-8101.
Version: 1.0
List Price: $399.95.

You could have the pleasure of mixing and
matching software for your new Mac.

The MI•• ···· 2'95
Mr Speci.l 8i.f'ICI ---­ JOO .
TelePort A300

A novel 2,400-bps modem gives you ADB convenience and excellent performance.

Modem prices have been steadily declining. In 1984, a decent 1,200-bps modem set you back $500 or so. And 1,200 bps was the top reasonable speed. Not only were the few 2,400-bps modems outrageously expensive but all the pay-by-connect-time services (such as GENie and CompuServe) also had whopping 2,400-bps surcharges.

That's changed. You can now buy a 2,400-bps modem for less than $100, and surcharges for 2,400-bps on-line services are mostly history. No one should consider buying a modem slower than 2,400 bps. Not all 2,400-bps modems are created alike, however, and modem quality translates directly into ease of use and time saved (see "Thoroughly Modern Modems" in this issue).

A recent addition to the ranks of 2,400-bps modems is Global Village's TelePort. Its price is excellent, and its performance is solid. Small and very light, because an external power source or transformer is not required, it's an excellent modem choice to take on the road.

A Free Port. What really makes the TelePort an excellent 2,400-bps modem is that it doesn't require a serial port to work. The TelePort connects to any ADB port (so it's usable on Plus or earlier Macs). The ADB seems to be a bit sensitive, at least in my setup, and the TelePort worked perfectly while plugged into a port on my keyboard and less well when plugged directly into the Mac. There's

Or leave it to us.

Why put yourself through all of that when all you really need is this.

We've packaged Microsoft Works with Quicken in order to give you six powerful tools in one simple box. A word processing module. A spreadsheet module. One-for databases. Communications. And personal/small business finances.

Everything you need to get down to business on your Mac. Quickly and easily.

See your dealer before December 31st. And find out how buying this special package can save you money. Not to mention all those endless hours of frustration.
"YOU WANTED A BETTER DRIVE AT A LOWER PRICE. YOU GOT IT."

40 Improvements, And We Still Lowered The Price!

Just as the competition was catching up, we made over 40 improvements to our M-series drives. We beefed up our cabinet, added features (see diagram below), radically updated our disk management utilities, and bundled award winning utilities from CE Software and Microlytics. We did all of this and still lowered our prices!

EXCLUSIVE!
MediaManager™ Software With Every Drive.

MediaManager™ Mirror’s exclusive disk management utility lets you format and partition your drive into multiple volumes, and add password protection to each. Its Drive Spanning™ feature allows several drives to be viewed as one contiguous volume. In other words, two 650Mb drives can be turned into one 1.3Gb volume!

EXCLUSIVE!
VolumeBackup™ Software With Every Drive.

VolumeBackup’s sophisticated scripting feature lets you create custom backup procedures that automatically back up your data when it’s most convenient (like when you sleep). Back up to floppies, tape, another drive, or a SyQuest cartridge.

FREE!
Award Winning Microlytics And CE Software...A $400 Value!

With every drive, we’re including a collection of over a dozen CE Software utilities that includes QuickKeys Lite, DiskRip, MockPackage, Ask!, and Vaccine. And we’ve included Microlytics Gofer, a high-speed text search and retrieval utility, and Inside Information, the first hierarchical dictionary for the Macintosh. Several of these wonderful utilities received MacUser Eddy awards and MacGuide Golden Gavel awards.

The Anatomy Of A Truly Great Drive.

- Two Year Warranty backed up by our DriveCare Professional!
- Faster Quality Drive Mechanisms from Quantum, Fujitsu, Seagate, and SyQuest.
- External Termination Block is supplied to let you terminate your drive from the rear panel, the way Apple recommends.
- Gold Plated 50 Pin Connector ensure superior electrical connection.
- SCSI Address Switch lets you set your drive’s SCSI address from the rear panel.
- Dual AC Convenience Outlets are mounted safely away from the SCSI connectors, holding clips to protect you from electrical shock.
- Rear Panel Fuse Holder has an extra fuse tucked away in a hidden compartment, should you ever need it.
- 18 Gauge DriveShelf® is attached to the mechanism before installation to eliminate warping.
- Whisper Quiet Cooling Fan maintains cool operating temperature.
- Polystyrene Polymer Feet keep your desk scaffold free.

*Fixed hard drives only
Mirror Technologies, VolumeBackup and MediaManager are registered trademarks of Mirror Technologies, Inc. All other trademarks and logos are the property of their respective owners.

Ronald Eberstein, President/CEO

"Thank you for helping us design an even better drive. Through your input, 40 improvements were made to our already successful M-series drives.

But it was our idea to lower prices. The advantage of purchasing factory-direct is that when we negotiate lower prices we can pass the savings directly to you. No middlemen. No retailers. Period.

As always, you have my risk free ‘30 Day, Love It or Return It’ guarantee. Most orders ship the same day so you can be using your new Mirror Drive tomorrow. Try us and see for yourself."

Ronald Eberstein, President/CEO
A Complete Line Of Mass Storage Solutions.

Mirror Technologies helped pioneer Macintosh mass storage back in 1985. Since then we have developed the most comprehensive line of storage and backup solutions available. We offer internal and external hard drives, 45Mb removable drives, tape and DAT backup, rewritable optical, and CD-ROM.

Our T150 is a rugged European engineered tape drive based on 3M's DG600 format, allowing 150Mb to be backed up on each cartridge. Complete with automated software for unattended backup.

Our new T1200 incorporates the latest digital audio tape (DAT) technology that stores 1.3Gb of data on a pocket-sized cassette. Complete with Automated software for unattended backup. Tops and AppleShare compatible.

Our new CDR10 CD-ROM drive gives you access to a vast library of reference materials and clipart. And with full audio support, you can play any compact disc! Ships with our custom Remote Control Desk Accessory.

Our DriveCare Technicians Repair Our Competitors' Drives!

Since DriveCare's introduction in August 1988, our Technicians have repaired thousands of drives from almost every one of our competitors. And their data recovery expertise has earned them a place in the hearts of many MIS managers.

All of our drives are covered by generous warranties and come with free lifetime technical support by the same professionals that have made our DriveCare third-party repair service an institution.

Choose A Better Drive At A Lower Price.

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>M200(s)</td>
<td>20Mb</td>
<td>$247</td>
<td>$ 320</td>
</tr>
<tr>
<td>M300(g)</td>
<td>30Mb</td>
<td>$257</td>
<td>$ 337</td>
</tr>
<tr>
<td>M400(g)</td>
<td>40Mb</td>
<td>$377</td>
<td>$ 457</td>
</tr>
<tr>
<td>M450(s)</td>
<td>45Mb</td>
<td>$327</td>
<td>$ 417</td>
</tr>
<tr>
<td>M450(f)</td>
<td>45Mb</td>
<td>$367</td>
<td>$ 447</td>
</tr>
<tr>
<td>M800(g)</td>
<td>80Mb</td>
<td>$547</td>
<td>$ 647</td>
</tr>
<tr>
<td>M900(1)</td>
<td>90Mb</td>
<td>$527</td>
<td>$ 597</td>
</tr>
<tr>
<td>M105(g)</td>
<td>105Mb</td>
<td>$647</td>
<td>$ 797</td>
</tr>
<tr>
<td>M130(g)</td>
<td>130Mb</td>
<td>$747</td>
<td>$ 977</td>
</tr>
<tr>
<td>M180(g)</td>
<td>180Mb</td>
<td>$847</td>
<td>$ 987</td>
</tr>
<tr>
<td>M325(g)</td>
<td>325Mb</td>
<td>$947</td>
<td>$1,097</td>
</tr>
<tr>
<td>M650(£)</td>
<td>650Mb</td>
<td>$2297</td>
<td>$ 2,297</td>
</tr>
<tr>
<td>R142</td>
<td>45Mb</td>
<td>$627</td>
<td>$ 627</td>
</tr>
</tbody>
</table>

(s) = Seagate, (f) = Fujitsu, (g) = Quantum

Call Today! Order Factory-Direct.

1-800-654-5294

TECHNICAL SUPPORT HOTLINE: (612) 633-2105
Hours: Weekdays 8 a.m. - 6 p.m. CST
Telephone: (612) 633-4450
Fax: (612) 633-3136
2644 Patton Road, Roseville, MN 55113

Please circle 107 on reader service card.
no apparent reason for that, but that's the way it worked.

The ADB has a bandwidth of about 6,000 bps. The TelePort itself uses 4,800 bps, leaving 1,200 bps for the keyboard and pointing device. In theory, a speedy typist could see a tiny performance degradation, but in reality there are no ill effects.

Speed tests (modern races) on a wide variety of file types in Mac-to-Mac and Mac-to-on-line connections showed excellent results. Both straight-text transfers and protocol transfers ran at full speed virtually all the time. Whenever the other end of the connection could support 2,400 bps, the TelePort kept up easily.

The TelePort offers MNP (Microcom Networking Protocol) Level 4 error correction and MNP Level 5 data compression/error correction as options. These can be very useful in some cases, but they can degrade performance if used carelessly. CompuServe connections work best, for example, when both MNP options are turned off.

A nicely designed INIT/cdev, controls your serial ports. It didn’t conflict with any of my other INITS and cdevs, which include some notorious troublemakers. To select your setup, simply click on the desired connections.

The software adds a panel to the menu bar that gives information traditionally supplied by LEDs; it also shows the connection speed and the actual number of characters transmitted (in both directions) per second. I wish that all modems could display such a useful panel.

The manual says that Smartcom II —

With the HP DeskWriter, you can
the telecommunications software that ships with the TelePort — doesn’t allow the printer port to be shared with AppleTalk. That’s the only error I found — the latest versions of Smartcom work fine. This manual is notable for its excellent design and superb clarity — it’s so good that other manual writers could use it as a model.

Registration for domestic users is automated. When you first use the TelePort, it tells you whether it is hooked up correctly and whether you’ve registered it. To register, you simply fill out a simple dialog box and click on the Do It button. The software then makes a quick call to a toll-free number and registers you. Neat.

Support is available by phone and via America Online. A free America Online startup kit is included so you can reach Global Village there.

The Bottom Line. Planned TelePort enhancements include a 4,800-bps, Group III-compatible, send-only fax package and an address book/dialer. Both are software-only add-ons and will cost $60 each. The fax software should be available by the time you read this, and the address book should have been out by the end of 1990.

The TelePort comes with a short (9.5-inch) telephone cable and a wall mounting plate. It isn’t the fastest modem you can buy, but there’s more to it than sheer speed. It’s the best 2,400-bps modem I’ve ever used — and that includes all the excellent Hayes and US Robotics units.

— Steven Bobker

## HookUp!

HookUp! is the software equivalent of an electronic multimedia hobby kit.

HookUp! is billed as an iconic software kit for the Macintosh. Although the folks at Hip Software would like you to think of it as a software erecter set, a better comparison might be with the hobby-shop electronic-module kits of years past.

You remember those things: By plugging various electronic parts into a perforated circuit board, you could assemble radios, lighting networks, sixth-grade science-fair projects, and so on. None of the resulting devices worked terribly well — certainly your mother wasn’t about to have it all. (But keep it to yourself.)

The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $995* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and AppleTalk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter’s whisper-quiet operation, and keeping it to yourself will be that much easier. So call 1-800-752-0900, Ext. 1004 for your authorized HP dealer.

There is a better way.

### Multimedia

Get Info

**TelePort A300**

**Manufactured by:** Global Village Communication, 1204 O'Brien Drive, Menlo Park, CA 94025; (800) 736-4821 or (415) 329-0700.

**List Price:** $225 ($149.95 direct from manufacturer).
Ergit — a green, squishy sort of creature — is one of the characters you can animate in Hookup!, the software erect set from Hip Software. The Network window shows all the connections required for Ergit to schlump his way across the Animation window.

These mini-applications can perform a variety of functions, such as generating musical or visual output that responds to keyboard input or mouse movements. You can also create feedback loops so that the on-screen visuals respond to musical output or vice versa. For example, you could link a happy face to the notes in a major triad and a sad face to the notes in a minor triad. Input is available through number boxes, sliders, buttons, mouse-input boxes, and MIDI. The output appears in number boxes and graphs, as sounds and animation included in the program and as MIDI Out data.

You activate all icons by dragging the desired part from the icon palette to an open work space called the Network window. You then plug the different icons together with graphic "wires," which you draw with the wiring tool. HookUp! also supplies a scissors tool for severing any unwanted connections.

It's easy to understand the simple relationship between input and output devices. For example, drag the mouse-input icon to the window. Connect output boxes to the x- and y-axis outputs on the mouse icon with the wire tool. The resulting numbers appearing in the output boxes indicate your horizontal and vertical mouse positions. If you have a MIDI instrument and interface, try connecting input number boxes to the MIDI-output icon to select the note and determine the velocity at which your synth will play. To

---

**With the HP ScanJet Plus, you've**

**The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.**

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for $2,190, about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call 1-800-752-0900, Ext. 1005 for your authorized HP dealer.

There is a better way.

---

**HEWLETT PACKARD**
trigger a MIDI event in this configuration, attach an on/off button to the MIDI-trigger input.

Want to add animation? Simple. HookUp! includes animation cels (frames) created with MacroMind's VideoWorks II. By making the right connections, you can design small multimedia programs that include sound and animation. With little effort, I was able to make Ergit — a green, squarish sort of creature — tango across the screen to the accompaniment of the Pink Panther theme. Not a terribly useful routine but fun to make.

A Short Circuit. Learning the basics of HookUp! is not difficult. The manual contains a short tutorial that walks you through a simple animation exercise. The rest of the manual is devoted to a somewhat terse explanation of each icon's function. The program disk includes examples of each icon working on a rudimentary level as well as in combination with others to form more sophisticated structures. With the tutorial and software examples, you should be able to work through simple to intermediate tasks. Although HookUp! allows the creation of more-complicated networks, programming novices may find these routines intimidating. The manual could be improved by an expanded tutorial detailing the building of complex routines.

The Bottom Line. HookUp! only hints at things to come. There are severe limitations in the kind of software you can put together. You can't create your own animation without using VideoWorks II or MacroMind Director, so your immediate choices are limited to that green, squarish thing: a toddling pterodactyl in sneakers; a bouncing olive; and a few geometric and musical shapes. The supplied sounds are unlikely to cause Brian Eno to hunt for a day job, and the MIDI implementation is limited. This is not the package to use for that big sales presentation at MegaBucks Corp.

The point here is not the usefulness of anything you might create with HookUp! — it's the process of putting it together. After all, how great was the fidelity of that radio kit you assembled for the science fair? HookUp! introduces the basic concepts of programming in a nearly failure-free environment. You may become so enamored of building routines that you dash down to the local junior college and enroll in a programming class. Perhaps, in the near future, you'll even learn to design an extensive icon-oriented language that has some practical application.

— Christopher Breen

HookUp!

Published by: Hip Software, c/o CTM Development, 1013 S. Claremont, Suite 1, San Mateo, CA 94404; (415) 573-8945.
Version: 1.01.
List Price: $149.
Project Scheduler 4

Scitor's organizational powerhouse shows its developer's DOS roots a bit too much.

If you think you missed Project Schedulers 1 through 3, you're right — unless you also manage projects with a PC. Project Scheduler 4 is Scitor's first entry into the Mac project-management arena, and it brings some formidable features to the race. Unfortunately, it also brings some unintuitive DOS habits along for the ride.

DOS Project. From the second you start a new project, you are immediately struck by the program's awkwardness. The first things you see are empty graphics windows for Gantt charts and PERT networks and a Job Template window. MacProject or MicroPlanner/Works would probably click in the network diagram (the graphics windows) and quickly become frustrated when nothing happened. Although you can perform some management functions (such as changing dates) by using graphics, most of Project Scheduler 4's interface would be just as appropriate in the character-based DOS world.

But interfaces aren't everything. Project Scheduler 4 has an impressive list of features that hard-core project managers should find appealing. Rather than simply stringing tasks together, it expects its users to organize their tasks in a WBS (Work Breakdown Structure). WBS is a standard project-management tool that helps define the granularity of a project, but all the work of categorization and division must take place outside the program. In fact, most of your thinking needs to take place outside the program.

After you've performed a few Mac-like functions, such as giving the project a name and defining the calendar, Project Scheduler 4 begins its serious work in tables, which it uses to define resources. Resources cost so much per hour and are usually available 5 days a week. Project Scheduler 4 uses cryptic codes (h is for hours and d is for days). After defining your resources, you enter project tasks in a similar table that uses WBS, RBS (Resource Breakdown Structure), and OBS (Organization Breakdown Structure) codes in addition to d and h. The system does have the virtue of ignoring most incomplete fields, so you can add your codes later (or not at all) if you wish.

Once you've agonized over entering your information into tables, it's time to structure your project in time. Unfortunately, creating task dependencies is as nonintuitive as most of the program's...
other functions. Rather than just drawing in the Network Diagram window, you must first highlight the item in the job table and then double-click on the network diagram to place the items. Drawing from a task box into a blank area in the PERT-chart window does create a new task, but clicking or double-clicking on the task does not activate the job template. You must search through the maze of windows to find the job template so you can define your new task.

Once you have your tasks defined over time, you can also see time lines, or Gantt charts, that display the duration of tasks and how much progress has been made to date. Various reports — such as the Job Column Report, Job Distribution Report, and the Resource Allocation Report — are available from the Reports menu. All Project Scheduler 4’s reports sound like standard MIS reports — and they look like them too.

**Talent Shows.** Project Scheduler 4’s greatest talent is its ability to link multiple projects based on WBS codes. Individual files, created by their WBS managers, can be combined in memory to create consolidated projects. The program can work around the availability of people and other resources through its active resource-leveling routine, and it automatically shifts dates to help accommodate overloaded resources.

Project Scheduler 4 displays actual versus planned information differently from the way other project-management programs do. Rather than having you input actual dates, Project Scheduler 4 saves a baseline plan as a snapshot of the project. Changes to the scheduler are then reflected as “actuals.” You can also show what percentage of a task is complete and even track actual versus planned.

---

**Refine your characters.**

The HP LaserJet III printer delivers the most refined 300 dpi print quality ever. And it’s easy to use. When configured with Adobe PostScript* and AppleTalk interface, the LaserJet III is completely compatible with your Macintosh. All for only $3,700†.

HP offers other Macintosh compatible LaserJets. The new LaserJet IID printer with increased paper-handling capability for $5,125‡. And the affordable LaserJet IIIP printer for only $2,595‡. Call 1-800-752-0900, Ext. 1108 for the name of your nearest authorized HP dealer and ask for the Macintosh versions of the LaserJet line.

There is a better way.
costs after adjustments for inflation. However, this baseline method (reflected in reports and Gantt charts only) makes visualizing plan changes difficult.

Because of Project Scheduler 4's heavy reliance on codes, I'd like to see the next version include visual displays of coded items. A visual editor would represent the project as a tree or outline, broken down by time, WBS, OBS, or RBS. In any particular view, items could be moved about into new categories or subtask structures.

The Bottom Line. Project Scheduler 4 is meant for dedicated project planners, not for average managers. Most managers can get along with MacProject II for heavy-duty work or with one of the Gantt-chart-publishing programs, such as FastTrack Schedule. Most of the coded breakdowns in Project Scheduler 4 require too much work and maintenance for average managers — and the interface makes them even more difficult to use. Project Scheduler 4 is required only when you need to break your tasks down into rigid reporting structures and have others work on portions individually or if you need to work or exchange files with Scitor's DOS versions. Given its heavy dependence on codes and generally non-Mac-like interface, Project Scheduler 4 may be the logical path for DOS users who are migrating to the Mac. On the other hand, since Mac users are unlikely to migrate to DOS, they may feel stranded in a foreign land. The program is promising, but it has a long way to go before it finds a Mac identity.

— Daniel W. Rasmus

Get Info

Project Scheduler 4

Published by: Scitor, 393 Vintage Park Drive, Suite 140, Foster City, CA 94404; (415) 570-7700.

Version: 1.0.

List Price: $685.

What's new in WinWord

Microsoft has decided it's time to move away from the word-wrap restrictions that have been in place since the first version. Now, WinWord will wrap lines to as many as 20 pages in a single document. Other changes include a new spell-checker that supports WinWord's macro-language, a new cursor that highlights text as you type, and the ability to print pages with headers and footers.
color machines, Animation Works may prove an ideal addition to a beginning graphics software library, since there are no other color animation packages anywhere near its price.

Gold Disk, 28675 S. Western Avenue, Suite 120, Torrance, CA 90501; (213) 320-5080. $199.95.
ETA: November 1990.

**TurboTax** is a new tax-preparation package from ChipSoft, a successful PC software developer. Instead of simply providing tax forms, TurboTax includes tax-consulting functions that question and prompt you for the proper information, as well as extensive help files that provide plain-English explanations of the tax requirements at each stage. TurboTax can import MacInTax files and can also exchange data with Quicken. In addition to the federal forms, ten state packages are available.

ChipSoft, P.O. Box 85709, San Diego, CA 92118; (619) 587-3939.
Federal forms, $39 each; state forms, $49 each.
ETA: November 1990.

---

**Animation Works**

Color machines, Animation Works may prove an ideal addition to a beginning graphics software library, since there are no other color animation packages anywhere near its price.

Gold Disk, 28675 S. Western Avenue, Suite 120, Torrance, CA 90501; (213) 320-5080. $199.95.
ETA: November 1990.

**TurboTax** is a new tax-preparation package from ChipSoft, a successful PC software developer. Instead of simply providing tax forms, TurboTax includes tax-consulting functions that question and prompt you for the proper information, as well as extensive help files that provide plain-English explanations of the tax requirements at each stage. TurboTax can import MacInTax files and can also exchange data with Quicken. In addition to the federal forms, ten state packages are available.

ChipSoft, P.O. Box 85709, San Diego, CA 92118; (619) 587-3939.
Federal forms, $39 each; state forms, $49 each.
ETA: November 1990.

---

**The PaintJet with Macintosh interface.**
$1,520*

**The PaintWriter XL designed for shared use.**
$2,098*
MacAvenue's Protegé

...Dr. Macintosh That is

MacAvenue's Protegé drives meet the most demanding performance expectations. Want a second opinion? Listen to one of the most demanding Mac users, Bob "Dr. Macintosh" LeVitus, the guy who wrote the book on mastering the Macintosh.

How would you describe the perfect hard drive?

How about FAST and RELIABLE

Bob says, "I like my Protegé drive — a lot! With a fast and reliable mechanism, low price and a no-questions-asked, money-back guarantee, what's not to like?"

That's just one example of the high praise the Protegé is getting from Mac users. With storage capacity options of 20MB to 105MB, a choice of Seagate or Quantum drive mechanism and our quality customer support, how can you go wrong?
is Just What the Doctor Ordered...

Engineered to Stay Cool!
You can expect the Protege to work hard for you. We've engineered this drive to stay cool, because a cool drive is a reliable drive. The Protege's whisper-quiet fan maximizes air flow across the drive assembly and past the power supply — efficiently cutting the danger of heat-related failure from the two most important parts of your drive.

Best Service and Support
We back the Protege with more than just talk. We also offer the best technical support! If you have a problem with your Protege drive, call us toll free at 1-800-766-6221. If we can't fix the problem over the phone, we will Federal Express you a new drive overnight — at no charge to you.

Smart Drive
Your Protege arrives preformatted and ready for work, loaded with easy-to-use, custom-designed utilities. With our new DiskMaster™ disk management software, you can create partitions for more efficient drive operation and password-protect each partition. And each partition can be accessed easily from your Mac's Control Panel. The software even allows for disk spanning across several drives and creation of ProDOS and UNIX partitions.

Satisfaction Guaranteed
Like all MacAvenue products, the Protege is backed by superior documentation, a 30-day, no-questions-asked guarantee, a one-year warranty (2 years on Quantum drives) and toll-free technical support. Whichever MacAvenue drive you choose, it won't take you long to realize that your Protege is definitely a best buy. As Dr. Macintosh says, "What's not to like?"

Exclusive! Find Lost Files Fast!
And you'll never lose a file because the MacAvenue Protege comes bundled with OnLocation, the amazing file-finding utility that will search your entire hard drive and find a lost file in seconds. Just type in a file name or even a few words within the file. On Location does the rest. A $129.95 value — Free!

Protege Hard Drives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Seagate</th>
<th>Quantum</th>
<th>Seagate</th>
<th>Quantum</th>
</tr>
</thead>
<tbody>
<tr>
<td>20+MB</td>
<td>$345</td>
<td>n/a</td>
<td>$295</td>
<td>n/a</td>
</tr>
<tr>
<td>40+MB</td>
<td>$395</td>
<td>$455</td>
<td>$325</td>
<td>$375</td>
</tr>
<tr>
<td>80+MB</td>
<td>$525</td>
<td>$645</td>
<td>$465</td>
<td>$595</td>
</tr>
<tr>
<td>100+MB</td>
<td>$649</td>
<td>$695</td>
<td>$575</td>
<td>$645</td>
</tr>
</tbody>
</table>

Call 800-753-6221 for free catalog!
HOW I LEARNED TO STOP WORRYING AND LOVE CONNECTIVITY:

NETWORKING THE '90s

What to expect in this decade — and how connectivity, interoperability, interapplication communications, and other polysyllabic powerhouse technologies will help you through it all.

BY JOHN RIZZO AND JON ZILBER

The '80s were the Me decade of personal computing. Individual computer users gained capabilities that used to require data-processing specialists, and vendors latched on to phrases such as personal empowerment.

But if the '80s were the era of desktop publishing, desktop engineering, and desktop just-about-everything-else, the '90s will be the decade that connects all the desktops; the Us decade. And just as Macs are no longer the only machines with desktop user interfaces, Macs will no longer be connected just to other Macs. Networks will embrace Macs, PCs, UNIX workstations, minicomputers, and mainframes.

You don't have to be an MIS jock to love connectivity. If you think connectivity is merely a necessary evil that your network manager takes care of, you've missed the point. If you share electronic information of any kind — text or data files, graphics, page-layout templates, schedules, E-mail, and so on — with other computer users, you have a vested interest in making the most of your network connections. The products and technologies of connectivity have become an integral part of everything from Apple's forthcoming System 7.0 to "hot links" among application-software packages to compression features that let you squeeze large graphics and video files into fewer bytes.

In other words, connectivity is maturing from just a buzzword to the single most important competitive tool of business computing.

As with the unifying of the European Communities, the force driving this coming together of computerdom is not altruism but self-interest. Mac users will gain access to vast amounts of data and computing power without even having to be aware of what type of machine they are accessing. More and more companies will become part of an emerging "GlobalNet" — a United Nations of corporate, academic, and government databases and information networks.
The GlobalNet is not a product or a specific communications protocol; it's more of a Platonic ideal. In it, all the public and private participants will maintain their own discrete local networks, but — as with the commerce among member nations of the United Nations — each member network will be able to import and export data, translate documents into any GlobalNet language, adapt to foreign protocols and standards, and generally allow any citizen on any network to communicate with any other citizen on any other network.

As with the United Nations, it's a tall order, and it won't all happen overnight. But bit by bit, the GlobalNet is moving toward reality.

If you've been using computers since pre-PC days, the GlobalNet concept may sound like a throwback to those repressive and tyrannical days of centralized data-processing departments. And it might conjure up images of Big Brother or of an era in which an information-rich elite controls society.

But the emerging GlobalNet is likely to be more democratic than the situation in the '60s and '70s, when MIS dictators determined what hardware and software people used. Individual users will continue to decide what machine and what software are best for their tasks. The role of the GlobalNet — and of the MIS department — will be to connect users to the rest of the world, regardless of what box they have.

This is no mere technological fantasy — it's a revolution in progress.

Apple has been ready for the revolution — indeed, it has been rallying the rebels — since the early days of the Mac. Connectivity is built in to both the hardware and the operating system, with more tools on the way in System 7.0. Apple's alliance with DEC has finally borne fruit with LanWORKS, which gives Mac users easy access to VAX data.

Unlike the isolationist world of IBM PC-compatibles, in which networks are still the exception, the Mac world
Figure 1: In an Ethernet network, computers can send out messages whenever it is convenient for them. This often results in colliding messages on the network that must be re-sent. Token-ring networks avoid this problem in that their computers pass an electronic "token" around the ring; only the holder of the token has permission to communicate over the network.

is mostly populated by machines that already belong to a network. In fact, since it's easier to connect a PC to a Mac than to another PC, the new low-cost Macs may even find new markets — as PC-network managers!

OK, so how should you get ready for the revolution?

That's a question we at MacUser started asking ourselves about two years ago. That's when technical director Henry Borman started planning and developing the MacUser Labs NetWorkShop (which moved into its state-of-the-art permanent quarters, shown in the accompanying photo, this past October). The NetWorkShop — filled with Macs, PCs, VAXes, Sun and NeXT workstations, and networking hardware and software from all the major players — is a LAN researcher's dream come true.

If you don't have half a million bucks to set up your own test facility, keep an eye on the monthly Bridges section for the latest in connectivity news. This month you'll find lab reports on A/UX (Apple's own version of UNIX for the Mac); APIs (software that lets your Mac access mainframe databases); and some of the basic workhorses of connectivity, 2,400-bps modems.

There are three categories of products — incorporating three key technologies — with which you need to be familiar. The most obvious category comprises physical connections. Like indoor plumbing, the products in this category aren't the most glamorous — but you can't live without them.

The second area is the ways of sharing services among machines. File serving, E-mail, and print serving are just some of the services now appearing on multiplatform networks — but only after bridges have been built between Macs and other types of computers.

The final challenge is getting the network to work as a single well-tempered machine. This includes getting Macs, PCs, and other machines to communicate harmoniously with one another. It also includes the complementary challenge of getting each piece of System software and every application residing on an individual Mac to work in concert with every other piece of software so that the whole is greater than the sum of the parts.

Within these three general categories — physical connections, the sharing of services with foreign services, and the seamless integration of every computer with every other computer on the network (including itself) — lie countless competing technological issues, solutions, and products. Here's a primer on some of the hottest areas the NetWorkShop will be investigating in the coming months in each of these three categories.

Connecting Machines

The Mac has built-in network-access capabilities; configuring a simple LocalTalk network can be a mere matter of running wires among Macs, printers, and other peripherals.
This is a mixed blessing. It makes life simple, but it does so by promoting a low-end, limited solution. Before your network starts slowing to a crawl, the first step toward upgrading it for the '90s is to rethink its wiring, topology, and capacity for higher bandwidth.

**Ethernet versus Token Ring.** On IBM PC-compatibles, there isn't any built-in networking — which means PC users have to pay for add-in boards to do simple things (such as hook up a printer) that Mac users take for granted. But once they're forced to reach into their pockets, many PC users are willing to dig a bit deeper. As a result, most UNIX and VAX networks, as well as many PC networks, use Ethernet, which provides a much faster connection than plain old LocalTalk does.

Ethernet is also fast becoming a popular upgrade option for Mac networks in which LocalTalk's transmission speed is a bottleneck. It's also becoming more affordable every year, with cards now in the $400-to-$500 range, with prices dropping rapidly.

But Ethernet isn't the only game in town. The token-ring topology, IBM's official method of networking PCs and mainframes, is a bit more complex and more expensive than Ethernet, but it has its advantages. Four-megabit-per-second token ring used to be in the shadow of Ethernet's 10-megabit-per-second speed limit, but interest in new 16-megabit-per-second token ring is growing.

There's a more fundamental issue at stake in the Ethernet-versus-token-ring debate: The key distinction of token-ring networks is that they are immune from a problem called contention. Ethernet and LocalTalk nodes send out a message on the network whenever it is convenient for each computer. If two computers send out a message at the same time, the messages collide and are destroyed, so the computers have to take the extra time to send out the messages again, thereby increasing the time it takes to get them across. The more nodes on the network, the more likely this is to happen, slowing the performance of the entire network. With enough nodes speaking at once, you get the equivalent of an angry British parliament, with nobody hearing anybody.

In a token-ring network, the nodes speak one at a time, only when they have permission. Permission is granted when the node receives an electronic "token" that is passed from node to node. The speed of the network depends on the speed at which the token is passed, which is very fast (see Figure 1). Token ring becomes more attractive as networks become bigger and more crowded with traffic. Discovering the precise point at which Ethernet contention becomes a problem will have to wait for an upcoming NetWorkShop report.

(From we've told you where token ring gets its name, we should also explain the name Ethernet. It is derived from the 19th-century concept of the ether, the supposedly all-pervasive fabric of the universe, required for the propagation through space of light and other electromagnetic radiation. The ether concept, disproved in 1887 by the famed Michelson-Morley experiments, was a necessary component of various short-lived physical theories proposed to explain anomalous experimental oddities that ultimately prompted the development of quantum physics and relativity. Thus, Ethernet implies an all-pervasive network medium, a misnomer to the extent that token rings keep Ethernet from having a monopoly.)

**10BASE-T.** If Ethernet is the current monarch of network transmitters, 10BASE-T will become the monarch of Ethernet, replacing traditional Ethernet systems that use thick coaxial cabling. 10BASE-T is the IEEE specification that defines the type of cards, connectors, and hubs required to put Ethernet onto twisted-pair wire, which is also used for office telephone systems and most LocalTalk networks. Twisted-pair wiring is cheaper than the traditional Ethernet coaxial cabling (particularly if twisted-pair is already installed) and easier to configure (if it isn't), because it uses the time-tested tools and techniques of the telephone-wiring trade. And using existing properly installed wiring can help you avoid problems caused by retrofitting, such as putting the cabling into ceiling panels, where fluorescent lights take their toll on passing network signals.

**Fiber Optics.** If 10BASE-T is the connectivity freeway of the early '90s, the superhighways of the late '90s will be fiber optics — sleek speedways illuminated by billions and billions of twinkling points of light. We're not talking about Carl Sagan's stars or George Bush's volunteers but the pulses of light that can be transmitted over hair-thin, transparent strands of glass or plastic. The same technology that gives US Sprint crystal-clear long-distance phone connections is available for LANs (local-area networks). A fiber-optic cable can have a bandwidth several orders of magnitude higher than a conventional copper cable that conducts electrical signals. This kind of bandwidth means that big files — whether the full text of the collected works of Shakespeare, 32-bit-color graphics, or even full-motion video with sampled sound — can shuffle around a network in real time.

But optical cable by itself can't make your network go faster. Right now, a Mac network can't go any faster than the LocalTalk, Ethernet, or token-ring transmitters that send out data over it — regardless of a cable's bandwidth.

Fiber optics are useful for customized LAN-to-LAN connections in which multiple signals are multiplexed and sent en masse. But the big switch from electrical to optical transmission won't happen until optical transmitters and receivers are built directly in to the Macs and peripherals themselves.

Some LANs are already turning to fiber optics for reasons other than bandwidth and transmission speed. Optical cable has far less degradation of signals than does electrical cable, allowing for local-area networks that are not so local, stretching out over longer distances than are possible with wire. Optical networks are also more secure from electrical interference and unauthorized intrusions.
And fiber-optic cables are smaller than comparable electrical cables — an important consideration in high-rise office buildings, where elevators must sometimes be decommissioned because the elevator shaft is needed to accommodate the overflow in floor-to-floor cabling.

There is also a longer-range reason to consider optical cable today. Because of its capacity for high bandwidths, optical cabling will be ready for the successors of Ethernet that will come along 10 to 15 years from now, which may run at orders of magnitude faster than today’s network transmitters. And since the cost of installing the wiring for a facility can run in the tens or even hundreds of thousands of dollars — far exceeding the cost of the cable itself — you just might want it to last a decade or two.

**ISDN.** ISDN (Integrated Services Digital Network) is a protocol for carrying both voice and data across long distances at high speeds through phone lines without the use of modems. In an ISDN world, bandwidth is always on tap, a standard utility — like running water, electricity, and phone service — at home and at work.

Those of us old enough to remember 1964 may recall the picture phones at the New York World’s Fair. Like the flying cars of the 1939 World’s Fair before it, picture phones became iconic symbols of the fair but never turned into a service that customers were willing to pay enough for to make a reality.

But with ISDN, practical picture phones are just the beginning. With integration of voice, data, and even video information, you can have freeze-frame picture-phone service running on your Mac while you’re accessing and displaying mainframe data in another window.

Instead of using a modem to convert digital signals to analog for sending over a phone line, ISDN can transmit digital signals directly between computers in different cities. More digital signals than analog can be sent over phone lines, so an ISDN channel runs at 64,000 bps. ISDN can consist of multiple channels, offering total bandwidths of 144,000 bps and 1,540,000 bps. These kinds of bandwidths can let us access networks in distant cities the way we now access local-area networks.

Apple already offers an ISDN NuBus card for developers that runs on ordinary twisted-pair telephone wire (see “Coming Soon to a Mac Near You: ISDN,” October ’90, page 227), but the ball is not in Apple’s court. ISDN won’t become universal until the standards now forming are adopted by the telephone companies and until they’ve installed enough ISDN equipment to be able to offer it to the masses. The stumbling block is that the telephone companies are just beginning to upgrade their network equipment to make it ISDN-compatible. Until the telephone networks in your area — and in the area of the party you’re calling — can handle ISDN, local ISDN hardware won’t do you much good.

**Multiprotocol Networks**

As our own NetWorkShop demonstrates, it’s a multiprotocol world. We have Sun, NeXT, VAX, DOS, OS/2, and A/UX machines integrated in our network. You probably work with a comparably mixed bag of machines — either physically connected; remotely connected via modem; or logically connected with files transferred via floppy, optical, SyQuest, or other media. Getting all the members of your extended network family to work together isn’t impossible, but it requires dipping into another bag of connectivity tricks.

**File-Server Access.** After the physical connections have been made, one of the first things users of various platforms want to do is access each others’ file servers. Unfortunately, each computer company has developed file sharing in its own way, so integrating the different worlds of AFP, IPX, and NFS (in English, that’s AppleShare, Novell NetWare, and UNIX file serving)
requires the learning of new world views.

This is nothing new. In the early days of the telephone network, competing phone networks didn't speak to each other and it wasn't uncommon to have several phones on your desk. When you wanted to make a call, you first had to check which network the other party was on and then use the appropriate phone to make the call.

Fortunately, file-server integration is further along than that. Apple has created developer tools that enable Mac users to log on to various platforms in the same way they log on to AppleShare: through the Chooser. File servers still aren't easy to integrate, but once everything's been set up, the Mac user has a single interface, with all platforms mounting on the desktop in the same manner. We've installed many multiplatform servers in the MacUser Labs NetWorkShop (see Figure 2).

Unfortunately, this standard user interface doesn't yet apply to accessing computers in other ways, such as through point-to-point file transfer, E-mail, and direct access of data from within Mac applications. To simplify and standardize computer access, Apple is enhancing the System software with connection tools such as the Communications Toolbox (see "Communications Toolbox," September '90, page 295). These tools save developers from having to devise an interface for new connectivity software. System 7.0 (and beyond) will have more (and more) of these tools.

**Common File Formats.** The '90s will see the continued growth of another type of connectivity, that among files from different programs. This kind of connectivity lets you open an Excel file with Full Impact or transfer a Microsoft Word file created on the PC to a Mac, thanks to file formats that have become de facto standards, recognized by different applications on different platforms.

De facto file standards will continue to multiply as vendors jump onto the compatibility bandwagon. As a result, software will become more specialized. Not only will you be able to use the best machine for the job but you'll also use the best software for each part of the job. For instance, you may use a vertical PC program to generate data for a specific project, import the data to a 2-D Mac visualizing program for a sketch, move it to a Silicon Graphics Personal Iris program specializing in 3-D, port it to a low-resolution Mac animation program, render the frames on a high-speed Sun workstation, and return the finished product to a Mac for presentation. Sure, there might be a single program that does everything, but not as splendidly, quickly, or inexpensively as each of the specialist programs and platforms.

**Working in Sync**

Just as Macs are becoming part of a growing GlobalNet of Macs and non-Macs, each individual Mac consists of a thriving microcosmic network of System software, applications, and locally resident data. Getting each separate application inside the computer to communicate so that all the programs directly and automatically share information is a task as challenging as getting all the boxes to talk to one another. In a sense, these two tasks are flip sides of one coin.

**Multimodal Distributed Processing.** Using a network as a single machine — that is, automatically farming out tasks to different computers — will become possible through new technologies such as IAC (interapplication communication) and RPC (remote procedure calls). IAC, one of the new features that will be introduced with System 7.0, lets applications connect and communicate locally or across networks. For instance, in the preceding scenario of using different programs for a single task, everything could happen automatically over a network that used IAC to link the applications. Once programs become IAC-compliant, you'll be able to link any programs you like or create your own combinations, regardless of vendor. Developers are also excited about a part of System 7.0 called AppleEvents, a class of commands unique to the Mac that enable applications to control other applications.

AppleEvents, in part, is similar to RPC, a mechanism used by several non-Mac computer systems, in which other computer systems' remote procedure calls allow one computer to control applications or subroutines on other machines across a network. RPCs can be used to fetch information from databases or to offload heavy processing tasks to a more powerful host computer.

Of particular interest will be the combination of AppleEvents with RPC techniques, such as those available in Digital's VMS operating system for VAX computers. Unfortunately, AppleEvents and RPC are not yet compatible. As with file formats, vendors will ultimately need to solve these incompatibilities so that any software or hardware on the net will be available to anyone. Users then won't have to learn how to use a VAX or a PC—or the software running on them. The software on the Mac will search the network, find the computers and software applications that specialize in certain tasks, and tell those computers to run the tasks and report the results back to the user. Users won't need to be aware of what software is being used or where the processing is taking place.

The toughest part will be making it all happen behind the scenes. Not only must the pieces all fit together but users should also be able to navigate through a complex system they've never seen before. Just as anyone with a little driving experience can hop into a rental-car model they've never driven before and set off without even thinking, our goal for the Mac network of 1999 is nothing short of an intuitive, transparent, seamless, high-speed GlobalNet you can hop into without thinking about it.

Sounds like more flying cars? Don't blink; the core technologies are coming soon to a network near you.

John Rizzo and Jon Zilber are both old enough to remember the 1964 New York World's Fair, the Mic decade, wicked-fast 300-bps modems, and System 4.2.
MachOne

The MachOne Drive provides up to 600MB of storage with a 1ms access time and transfer rates up to 5MB/sec. All of this at prices which are reasonable, because the MachOne increases productivity, saving time and money. If you are a programmer, and your compile times are cut by 30%, your productivity is increased significantly. You can save more money by sharing the drive with several programmers. If you do graphics and layout and get paid by the piece, the speed of a MachOne can increase your productivity and profitability by a factor of ten. You get more value out of your other equipment too, because it’s no longer held hostage by a slow drive.

DOSFloppy

The new DOSFloppy from PLI is a SCSI floppy drive which offers both 360k and 1.2MB disk formats with a single Macintosh drive. Other manufacturers require you to buy two separate drives to fulfill those needs. DOSFloppy is fully daisy-chainable and features external SCSI address and termination switching. AccessPC from Insignia Solutions is bundled, free, with the drive. AccessPC is a CDEV/INIT which causes MS/DOS diskettes to mount on the Desktop, just as if they were Macintosh disks. The files can be opened by double-clicking or copied by dragging in the Finder.

SuperFloppy

The SuperFloppy and TurboFloppy 1.4 are SCSI floppy drives for the Mac, which provide 1.44MB Mac and DOS and 720k DOS diskette compatibility. The SuperFloppy offers the added benefits of 400k and 800k Macintosh compatibility. Both drives are fully compatible with AccessPC and SoftPC from Insignia Solutions. They are also compatible with all of the popular file translation software. This means that, under DOS emulation on your Mac, the floppy's will act like DOS drives, and in the Mac's Finder, DOS floppies mount on the Desktop. The drives feature external SCSI ID and termination switches, and auto-eject.
Infinity 40 Turbo
The Infinity 40 Turbo uses removable 44 MB cartridges for convenience and virtually limitless storage potential. It is also extremely fast, with a 20ms access time. The Infinity 40 works on all SCSI Macs and IBM PC AT, XT, PS/2 and compatible computers. MS/DOS files may be accessed on the Mac with our DOSTransfer utility. Bundled free with each (non economy) Infinity 40 for the Mac is Casady and Greene's A.M.E., the most complete software security package available for the Mac and a $279 value.

Optical Drive
Rewritable magneto-optical drives are becoming more and more accepted as storage solutions for the typical user. The drives offer high-capacity, low cost per megabyte and data integrity far superior to that of conventional magnetic media. They are also surprisingly fast. PLI offers three attractive optical solutions. The familiar single drive Infinity Optical (600MB), the Jukebox Jr. (6.5 Gigabytes) and the Infinity Optical Jukebox (36 Gigabytes). We will work with you to provide the solution you need.

CD ROM Drive
The PL CD-ROM is based on a new, 380ms Sony mechanism. It features a self-cleaning objective lens, audio output through a 1/8" headphone jack and two RCA jacks, full volume control, and external termination and SCSI ID switches. The software supports HyperCard audio XCMDs and multiple volume CD-ROM discs. Also included is a DA, Music Box, which allows the playing and full control of audio CDs in the background.

Peripheral Land Incorporated • 47421 Bayside Parkway • Fremont, California 94538
Call for a catalog or dealer near you (415) 657-2211 or Fax (415) 683-9713
Please circle 68 on reader service card.
The box may say 2,400 bps, but don't be fooled — these communication speedsters can easily blast well past that barrier.

**THOROUGHLY MODERN MODEMS**

Modems are like cars — only smaller. Both have a single purpose: transportation from point A to point B. And both trade price for performance. Sure, you can pick up an old 300-bps modem or a used Yugo for next to nothing, but both will provide predictably pathetic performance. A 38,400-bps supermodem or a Porsche 959 can blast your data or you as fast as sanity will allow, but do you really need all that power? And can you even think of paying for it?

In between the Yugo and the Porsche nestle the family sedan and the 2,400-bps modem — fast enough for daily use without the sticker shock. And both can benefit from factory performance options. A 2,400-bps modem, for example, can now be turbocharged with data-compression and error-correction schemes that boost performance to three to four times its current level.
Modems

Error-correcting and data-compressing modems are not only more expensive than standard 2,400-bps modems but they're also harder to set up and use. They require hard-to-find hardware-handshaking Mac-to-modem cables and telecommunication software that supports data compression and error correction. When you're selecting souped-up 2,400-bps modems, we recommend that you stick to a Mac-specific modem package that comes complete with the correct cable and software—that's how we chose the modems we evaluated for this report.

Although there are dozens of modem companies, we found only eight error-correcting and data-compressing 2,400-bps modems that ship with complete packages for the Mac: the Anchor Automation 24E5 MacPac, Applied Engineering DataLink Express, Computer Friends Lightspeed 2400LE, Hayes V-series Smartmodem 2400, Intel 2400EX MNP-Macintosh, Mirror Technologies DM2405, Prometheus ProModem 2400M Plus, and Zoom Telephonics Zoom/Modem V.42bis.

Prices range from a low of $159 for the Computer Friends Lightspeed to a high of $699 for the Hayes V-series Smartmodem 2400. These packaged modems may cost a little more than stand-alone ones, but their bundled parts make them convenient bargains when compared with stand-alone modems that won't work correctly with your Mac.

Standard Modem Standards

The heart of any modem is its data pump, which determines much of its performance. The data pump is the chip—or set of chips—that handles the conversion of the Mac's digital signals into analog signals that the modem sends as audible tones over the phone line. This is called modulation—the mo in modem. On the receiving end, the data pump converts the analog signals back into digital ones, a process called demodulation—the dem in modem. Four of the modems we reviewed use data-pump chips from Intel; the rest use chips from Rockwell, Exar, and Sierra (see Table 1).

One telling aspect of a modem's performance is how well it handles error correction and data compression. Low-speed modems—300 bps, 1,200 bps, and standard 2,400 bps—include neither error-correction nor data-compression capabilities. Without error correction, they are prey to the myriad disturbances that can afflict telephone lines (see the "How It Works" sidebar)—a poor phone connection can garble their transmissions. Without data compression, low-speed modems are limited to their rated speeds. Compression enables a modem to shrink files at one end, transfer them in their shrunken form, and then unshrink them at the other end, resulting in an "effective speed" much higher than its rated speed. Thus a 2,400-bps modem with both error-correction and data-compression abilities can transmit error-free at effective speeds of up to 9,600 bps—four times its rated speed.

It's easy to evaluate error correction—it either works or it doesn't. The Hayes V-series Smartmodem
2400 and the Zoom/Modem V.42bis use an international error-correction protocol called CCITT V.42. The other six modems use Level 4 of the MNP (Microcom Networking Protocol) error-correction scheme (more on both of these later). Both error-correction protocols ensure that noise on phone lines doesn’t garble data while moving it transparently to the user. In fact, modems that have either in-modem error-correction scheme disconnect before sending error-laden data. (The V.42 protocol incorporates MNP 4, so the two modem types are compatible.)

Data-compression performance varies from modem to modem. The Hayes V-series Smartmodem 2400 and the Zoom/Modem V.42bis offer both V.42bis and MNP 5 data-compression schemes. The rest of the modems offer only MNP 5. Our testing showed V.42bis modems to be almost twice as fast as those that follow the MNP 5 protocol — but you need a V.42bis modem on both ends to take advantage of the faster speeds. The V-series Smartmodem 2400 and Zoom/Modem V.42bis lose their speed advantage when they’re talking with MNP 5 modems, because they automatically shift down to MNP 5 speed. All the modems we tested can also downshift to match the speed of an unenhanced 2,400-bps modem, a 1,200-bps modem, or even an archaic 300-bps sluggard.

If you’re starting to get confused about what the V.42, MNP 4, V.42bis, and MNP 5 numbers mean, just be happy that you’re not a modem manufacturer. These numbers and acronyms are just a few of the many names for modem-communication standards. First, there are standards governing how modems talk to each other. For example, the V.22bis standard, defined by the Geneva-based CCITT (the French acronym for the International Consultative Committee for Telephone and Telegraph), defines how all 2,400-bps modems communicate — whether they use error correction, data compression, or no enhancements at all (see “Modems: 9,600 bps and Counting,” January ’90, page 180). Microcom developed its error-correction and data-compression protocols back in 1983 and licensed the technology to other modem companies. MNP Levels 4 and 5 define these schemes for error correction and data compression, respectively. It wasn’t until 1989 that the CCITT defined its specifications for the new modem technology; by then the MNP standards were so popular that they had become de facto industry standards — which is why the CCITT made the V.42 specification compatible with MNP 4. Only two out of the six modems we reviewed use the CCITT specifications. The balance should shift as the advantages of V.42bis become apparent.

**Package Parts**

When we unpacked the modems, the Mac-to-modem cable was the first thing we examined. If the companies didn’t get this essential — and deceptively simple — part right, the rest of the package was doomed from the start.

To take full advantage of either MNP 5 or V.42bis data compression — that is, to achieve speeds greater than 2,400 bps — a Mac must send data at a higher speed, usually 9,600 bps. This ensures that the modem gets enough data to keep the modem-to-modem transfer going as fast as it can. (You set the speed through software.) But there are times when the modem can’t transfer at 9,600 bps — the file may not be compressible, or the telephone line may be so noisy that the modem has to resend the data. The Mac, however, still sends data at 9,600 bps through the serial port, so the modem has to have a way of telling the Mac to stop. This process is called flow control.

New modems achieve flow control through hardware — and the all-important hardware-handshaking cable. A modem sends current through a particular pin in the cable to tell the Mac when it can take data and turns the signal off when it can’t take data. The Mac serial port has an 8-pin connection, whereas most modems have 25-pin connections — the Applied Engineering DataLink Express is the only modem with an 8-pin connection. Normal Mac-to-modem cables, such as the one Apple supplies, aren’t wired to the pin required for correct flow control. The Macintosh serial port supports hardware flow control, but you require a
How It Works: An Encyclopedia of Phone-Line Defects

1. Amplitude jitter and amplitude hit
   Symptom: The other party's voice level keeps changing.
   Cause: The phone company is performing a "hot patching" test to get around telephone-equipment problems, or someone is picking up an extension.
   Modem: Modems are sensitive to sharp changes, whereas gradual changes have little effect.

2. Attenuation distortion and envelope delay
   Symptom: The voice on the other end of the line sounds flat, as if the bass and treble levels have been turned to their lowest possible settings.
   Cause: Parts of a signal's frequency become distributed while traveling along the wire.
   Modem: A modem compensates by reintegrating the parts.

3. Compression
   Symptom: You can't hear this one. The signal as a whole doesn't change, but its phase — the position of each bit-carrying-signal change relative to the previous change — is lost.
   Cause: On digital circuits — such as France's fiber-optic network — the digital equivalent of your voice is compressed in order to make room for more connections. This can destroy the phase of the signal.
   Modem: Because modems use phase changes to communicate at speeds faster than 1,200 bps, compression may limit modem speeds.

4. Cross talk
   Symptom: When signals "bleed" into each other, you start to hear voices from another line.
   Cause: There are many sources, but the most likely culprit is two wires that are too close to each other.
   Modem: This becomes a problem when the bleeding signal is coming from another modem connection.

5. Impulse noise
   Symptom: You may hear a loud pop that is caused by the telephone-network switching system.
   Cause: Telephone networks switch connections to and from different lines. Mechanical switching can sometimes cause a pop in the line. Lightning can also introduce this noise.
   Electronic switching can minimize it.
   Modem: A loud pop can cause a modem to send errors or, if it has in-modem error correction, to slow down.

6. Insertion loss
   Symptom: The signal is less than full strength when going from one end to the other, so you have trouble hearing the other person's voice. There can be different amounts of loss in each direction, so you may hear the other party when the other person can't hear you, or vice versa.
   Cause: Long telephone wires can cause loss of signal strength.
   Modems: Modems can work with weak signals, even when you may have a hard time hearing a speaker.

7. Nonlinear distortion
   Symptom: You can't hear this one. The signal as a whole doesn't change, but its phase — the position of each bit-carrying-signal change relative to the previous change — is lost.
   Cause: On digital circuits — such as France's fiber-optic network — the digital equivalent of your voice is compressed in order to make room for more connections. This can destroy the phase of the signal.
   Modem: Because modems use phase changes to communicate at speeds faster than 1,200 bps, compression may limit modem speeds.

8. Phase jitter and hit

9. Phase roll, frequency translation, and frequency offset

10. Single-frequency interference

11. Talker and listener echo

The next time you have a phone conversation, listen carefully and you'll hear a lot of other sounds besides the caller's voice. A modem is sensitive to these noises — as well as to other noises inaudible to the human ear. These noises are called line impairments, and modem designers have to protect against them.

Like everything else in the telecommunications industry, line impairments are defined by standards. Line-impairment standards are put forth by the EIA (Electronic Industries Association) and the TIA (Telecommunications Industries Association). We set our test equipment to the EIA/TIA-496-A standards that define conditions common to local, transcontinental, and satellite-hop connections.
Nonlinear distortion
Symptom: When the voice on the other end sounds scratchy, you probably have too much distortion.
Cause: Noisy amplifiers, digital-to-analog converters, and systems that use radios to carry the signal can introduce distortion.
Modem: Moderns achieve their high speeds by changing the signal in subtle ways. Distortion can interfere with the signal so that the receiving modem can no longer understand it.

Phase jitter and phase hit
Symptom: The pitch of the signal changes and sounds like a vibrato.
Cause: The most common source is interference from the voltage another phone uses to ring its bell.
Modem: Moderns themselves alter the pitch of the signal to transmit information. If the pitch of the carrier signal is erratic, the receiving modem won’t understand the information being sent.

Phase roll, frequency translation, and frequency offset
Symptom: The pitch of the entire signal changes, but you probably won’t notice it unless you have a musician’s ear for perfect pitch.
Cause: Radio-frequency-based systems can lower or raise a signal’s pitch.
Modem: A modem is able to adjust to a steady change in pitch more accurately than a constantly changing pitch such as phase jitter.

Single-frequency interference
Symptom: This sounds like a howl or a whistle and can get very loud.
Cause: Old trunk circuits — wires between telephone-company central offices — are prone to malfunctioning and generating this noise.
Modem: Most modems can filter out this noise, so they are not affected by it.

Talker and listener echo
Symptom: This is the echo you hear of your own voice or the voice on the other end of the line.
Cause: Signals can be reflected back to the sender, and the delay introduced by the extra travel distance causes the echoes.
Modem: Although all modems can be affected by echoes, high-speed V.32 9,600-bps modems are most affected and so have special chips to counter them.

White noise
Symptom: If you have an older FM receiver, you may hear what sounds like a waterfall when you’re between stations. This is white noise.
Cause: White noise, generated by the movement of molecules, is inherent in all electronic circuits. Analog equipment — such as telephone circuitry — generates much more white noise than digital equipment does.
Modem: Modern tolerant varies with the speed of the data transfer — the higher the speed, the less tolerant the modem.
hardware-handshaking cable that is wired to the flow-control pin (see “Modem-Cable Rewiring,” January ’90, page 213).

Five companies — Anchor Automation, Applied Engineering, Mirror Technologies, Prometheus, and Zoom Telephonics — include hardware-handshaking cables. We’d count Hayes as number 6, but although its cable did support flow control, a faulty ROM in the modem wreaked havoc on our Mac serial ports and caused the Mac to ignore flow control. Hayes now recognizes the problem and will upgrade the defective ROMs without charge.

Computer Friends and Intel sent cables that didn’t implement flow control at all. What made things worse was that instructions sent with the modems assumed that the right cables were being used. Both companies claim to be shipping the right cable, but make doubly sure when you call about an order.

**Software**

Armed with the right cable, you’re ready to use the modem. This is where bundled software can help make life easier, but only two companies — Hayes and Prometheus — provide easy-to-use and intuitive software. The Hayes Smartcom II software and the Prometheus MacKnowledge software automatically set the modem for error correction and data compression. The interfaces for Smartcom and MacKnowledge are

---

**Solutions to Modem-Related Problems**

You go to the kitchen for a cup of java while waiting for the last 5 minutes of a 20-minute download. But in the middle of pouring your steaming cup, you notice your visiting cousin pick up the kitchen phone and start dialing. You run, mouth agape, to your Mac, which now has a “no carrier” message instead of “download finished” on the screen. All you can do is curse and redial.

There are solutions to this and other modem-related problems. To protect against unknowing cousins, DesignTech has the Interruption Blocker. This $14.95 device sits between the phone jack and the phone you want to block. If a modem or another phone is off the hook, the block is disabled. DesignTech International, 7401 Fullerton Road, Building 1, Springfield, VA 22153; (703) 866-2000.

Nature can also wreak havoc with a modem. For example, if lightning strikes a nearby telephone pole, your modem may instantly become an expensive paperweight. Panamax offers several protective devices for just such an unexpected occurrence. You can buy a device just for the phone line (Datamax, $49) or a combination AC-power and phone-line surge suppressor, available as a single-outlet Faxmax ($89), a dual-outlet Telemax 2 ($99), or a four-outlet Telemax 4 ($128). Panamax backs its products with an impressive guarantee: If any device is damaged by a transient surge that passes through its protector, Panamax will pay the repair bill. Panamax, 150 Mitchell Blvd., San Rafael, CA 94903; (800) 472-5555.

For those of you who travel and want to use a modem, Farallon Computing has two nifty products. For $49.95, you can buy the WakeUp cable, a hardware-flow-control modem cable that also connects to an ADB port so it can power up your Mac when you dial up the Mac’s modem. Farallon also markets the Portable Pack, geared for Mac Portable users on the road. You get a virtual survival kit for remote computing, including wire cutters, phone cable, every imaginable phone connector, alligator clips, and even a Swiss army knife.

Farallon also markets the Portable Pack, geared for Mac Portable users on the road. You get a virtual survival kit for remote computing, including wire cutters, phone cable, every imaginable phone connector, alligator clips, and even a Swiss army knife. The price of the Portable Pack is $49.95 and includes Farallon’s Timbuktu and TimbuktuRemote, programs that let you control a Mac from another Mac. Farallon Computing, 2000 Powell Street, Suite 600, Emeryville, CA 94608; (415) 596-9000.

If you’re on a PBX and don’t have another phone line for your modem, you can add a phone jack through your PBX with Traveling Software’s Mo Fone. Besides having the hippest name since the ‘70s, this little device works with many common PBX devices and key-switch phones, including AT&T’s Merlin system. It even comes with alligator connectors that hook onto the inside of the handset. The Mo Fone sells for $99. Traveling Software, 18702 North Creek Parkway, Bothell, WA 98011; (800) 662-2652.

For the busy office with a single telephone line, La Cie has a $249 device called the Phone Line Manager Plus that allows you to share the phone line with a fax machine, phone, modem, and answering machine. The Phone Line Manager Plus gives you or your answering machine five rings during which to answer a telephone call; otherwise the call goes to the modem. If the device detects a fax tone, the call is routed to the fax machine. You can also route calls manually with a touch-tone phone. La Cie Ltd., 16825 S.W. 85th Street, #306, Tigard, OR 97224; (800) 999-0143 or (503) 691-0771.

— Andrew Eisner

These five products can each in their own special way relieve telecommunication tension (clockwise from top): Farallon’s WakeUp cable and Portable Pack, Panamax’s Datamax, DesignTech’s Interruption Blocker, Traveling Software’s Mo Fone, and La Cie’s Phone Line Manager Plus.
Mac-like, with icons to drive the programs.

The other six modems bundle simple terminal-emulation programs. Three — the Anchor Automation 24E5 MacPac, Computer Friends Lightspeed, and Intel 2400EX — come with QuickLink II software. Applied Engineering bundles Terminal 1.5, a public-domain program, with its DataLink Express modem. The Zoom/Modem Y.42bis comes with Term. Mirror Technologies offers the best terminal program of the lot, bundling MicroPhone 1.5. The real deal of this bundle is that you can then upgrade to MicroPhone II 3.0, which lists for $295, for only $75. The Mirror DM2405 modem lists for $197. It's like getting a free — and reasonably powerful — modem for the cost of a copy of MicroPhone. We used MicroPhone II for our own testing.

Besides being far from intuitive, the terminal-emulation programs don't help you set up the modem for full data compression or error correction — you have to manually send the appropriate commands to the modem. To do this, you have to know what the commands are, which means (shudder) turning to the manuals.

Unfortunately, the manuals are pretty generic. When you read a manual and the only computer it mentions is a PC, you know you're not going to get much out of it. Only the manual from Zoom Telephonics gives you clear instructions about what commands to type into your program and download to your modem. With the rest of the modems, the instructions tend to be hit or miss. The next step is to call the company's technical support.

The two modems that gave us the least trouble to set up came from the two companies — Hayes and Prometheus — with the best tech support. With the other companies, the only thing going for you is luck, as in "good luck." If the person on the line doesn't know the difference between CCITT and a BLT, try your dealer or local user group for more help.

After setting up the modems as directed by the manuals or the manufacturer's tech-support folks, we used the software bundled with each modem to dial two on-line services — just to make sure that each modem/software/cable package worked. We dialed up Zmac — MacUser's on-line service — on CompuServe and BYTE magazine's on-line service — BIX — through Tymnet. We dialed in to 2,400-bps V.42 error-corrected connections — at press time, the two services had yet to offer V.42bis or MNP 5 data-compression connections. All the modems but Applied Engineering's DataLink Express connected without a hitch. The DataLink Express repeatedly lost the MNP 4 connection with Tymnet and dropped to a normal 2,400-bps connection without error correction. Therefore, we don't recommend the DataLink Express for use with these on-line services.

The other six modems improve throughput to better than 2,400 bps, but their price and performance couldn't match those of our four winners (from left to right): Anchor Automation 24E5 MacPac, Applied Engineering DataLink Express, Intel 2400EX MNP-Macintosh, and Mirror Technologies DM2405.

These four modems improve throughput to better than 2,400 bps, but their price and performance couldn't match those of our four winners (from left to right): Anchor Automation 24E5 MacPac, Applied Engineering DataLink Express, Intel 2400EX MNP-Macintosh, and Mirror Technologies DM2405.

The 2,400-bps Barrier

You set up a modem once, but you transfer data many, many times, so speed is ultimately the most important criterion in selecting a modem. We sent three types of files between a pair of modems from each manufacturer (see Figure 1). We designed our tests to reflect the fact that compression works by recognizing patterns — particularly repeating patterns — and then coding the data into smaller bits. We therefore chose three types of files with three types of internal patterns to see how successfully each would be coded — and thus shrunk — by the modems' compression algorithms.

We sent the test files over three industry-standard test lines: a noisy local connection, a noisy land-based coast-to-coast connection, and a fairly clean connection with a single echo-inducing satellite hop in each direction. We used a telephone-network simulator from PTT (Processing Telecom Technologies) to simulate the different line conditions. Testing by making calls over real telephone lines is uncertain at best, but with the PTT equipment, we were able to simulate the three line conditions consistently and accurately.

All the modems consistently broke the 2,400-bps barrier when transferring each of the three files. They also endured the different types of noise experienced on each of the three lines without shutting down. Above and beyond these basics, two modems — the Hayes V-series Smartmodem
Figure 1: Each of these modems includes foolproof error correction — its file-transfer speed that separates the winners from the also-rans. To test file-transfer speed, we transferred three types of files — a text file, a spreadsheet file, and a TIFF file — between two modems from each manufacturer. We also tested file-transfer speed with the text file compressed with Stufflt. We used sophisticated test equipment from Processing Telecom Technologies to simulate line impairments (noise and other disturbances) found on three types of telephone lines: a local line, a cross-country line, and a satellite line.

Overall Speed:
To discover the overall winner, we averaged each modem's performance on all the tests and then compared each modem with the winning Hayes V-series Smartmodem 2400. Both the Smartmodem and the Zoom Telephonics Zoom/Modem V.42bis use the V.42bis compression protocol. V.42bis proved far more efficient than the MNP Level 5 scheme the other modems use.

Text:
Although the two V.42bis modems remained the winners, the MNP 5 modems made their best showing in this test. All the modems were able to transfer the uncompressed text file at speeds well beyond 2,400 bps. In most cases, the type of telephone line made little difference in transfer speed.
Spreadsheet: Again, the two V.42bis modems showed their superiority on all types of lines — the Hayes V-series Smartmodem 2400 was a full three times as fast as the Applied Engineering DataLink Express. The DataLink Express actually dropped well below 2,400 bps.

Graphics: The Hayes V-series Smartmodem 2400 consistently surpassed 8,000 bps when transferring the TIFF file, with the Zoom Telephonics Zoom/Modem V.42bis following close behind. The MNP 5 modems averaged half the V.42bis modems' speed on all line types.

Compression: To compare the efficiency of each modem's compression scheme with that of the popular compression utility Stuffit, we transferred — with each modem's compression protocol active — an uncompressed and a Stuffit-compressed text file. We then "unstuffed" the Stuffit file and calculated the effective speed of the transfer — that is, how many unstuffed bits per second had been sent in stuffed form. We found that using Stuffit in addition to in-modem compression is faster than using any of the in-modem compression schemes alone.
2400 and the Zoom/Modem V.42bis — showed outstanding performance. Unlike the other six, both winning modems use V.42bis compression. V.42bis can compress up to twice the amount of data that MNP Level 5 can handle, thereby reducing transfer times. On the local line, the V-series Smartmodem 2400 sent a TIFF file — a bit-mapped file with a lot of compressible patterns — at a remarkable speed of just below 8,200 bps. Interestingly, MNP 5 modems compressed the text file tighter than they did the TIFF file.

Among the MNP Level 5 modems, the Computer Friends Lightspeed 2400LE was consistently the fastest. The other MNP Level 5 modems fell slightly behind, but the slowest performer in all the tests was the Applied Engineering DataLink Express. The DataLink Express failed to surpass even the 2,400-bps barrier when transferring the spreadsheet file, whereas the Hayes V-series Smartmodem 2400 sped along at more than 6,000 bps. Express is the last word we'd use to describe the DataLink modem.

Crunch Time

Our results show that the modems' data compression can push transfer speeds to well above 2,400 bps. There are also compression programs for the Mac — such as StuffIt and Disk Doubler — that let you precompress your file before you send it by modem. Many on-line services use StuffIt to compress downloadable files to save on both storage space and transmission time, so we used this popular file compressor to compress our test text file to see how well each modem would perform when sending a precompressed file.

MNP 5 modems can't recognize when a file is already compressed, so they choke on precompressed files in two ways: First, they all spend precious time trying — and failing — to compress the precompressed file. Second, some add extraneous compression-code information and create a data stream that is actually larger than the original file. V.42bis modems are smarter — they look to see if what they're doing is indeed helpful, and if it isn't, they send the original data instead.

Not surprisingly, when sending precompressed files, the two V.42bis modems were again the top performers in our tests. The V-series Smartmodem 2400 and the Zoom/Modem V.42bis broke the 2,400-bps barrier when sending the precompressed text file, whereas all the MNP 5 modems struggled, some dipping to well below 2,400 bps.

We then decided to test whether it's more efficient to precompress files with StuffIt or let each modem's internal compression powers do the chore. We discovered that using StuffIt and in-modem compression gives much better results than using in-modem compression alone (see Figure 1).

Of course, you have to consider the added time and hassle of compressing and decompressing the files manually — the modems compress and decompress files on the fly while they are sending and receiving them. Although compressing or decompressing a StuffIt file takes only about four seconds, you must also allow for the added time and energy spent opening the program, finding the archive, and typing in the name of the file to be saved. The convenience of in-modem compression wins out over the slight advantages of precompressing files on the Mac.

Best of the Best

Soupied-up 2,400-bps modems set new standards for price and performance. Data compression makes them faster, and error correction makes them more reliable than ever before — your family sedan now has a turbocharger and an air bag.

Speed is the bottom line in judging modem performance — especially when comparing Mac-specific packages — so we recommend that you buy a modem that supports the V.42bis data-compression standard (see "The Bottom Line" sidebar). A V.42bis modem can be twice as fast as an MNP 5 modem and also uses a more efficient compression algorithm. However, even MNP 5 can improve the performance of a 2,400-bps modem.

Stephen Satchell is a telecommunications expert who spends too much time commuting from his mountain home to MacUser Labs when he should be telecommuting.
**RELIABILITY.**

"After thousands of hours of use, we've never had a cartridge fail while in a DPI drive."

- BMUG Newsletter, Vol. VI, No. I

**44Mb Removable**

"The best of all the SyQuest removable drives available"

- BMUG Newsletter
  Vol. V, No. II

Compatible with IBM, Amiga, Atari, and all Macs.

**DPI 44R** ........ Call for Our Lowest Pricing!

**File Translation**

Transfer IBM DOS files to Macintosh format. Uses 5 1/4" MS/DOS 1.2 Mb or 360k diskettes. Compatible with SoftPC and AccessPC.

**DPI 1.2/360** ............ $399

**1.4Mb Floppy Disk Drive**

DPI's new 1.4 megabyte floppy disk drive supports Apple's new High-Density standard as well as MS/DOS format 1.44MB and 720K floppies. SCSI interface makes it compatible with all Macs from the Plus on up, without the need for an expensive ROM upgrade. Compatible with SoftPC and AccessPC.

**DPI 1.4** ....................... $259

Please circle 44 on reader service card.

1-800-825-1850

40 Corning Avenue, Milpitas, CA 95035

TEL 408-945-1850

FAX 408-945-8148

IMMEDIATE DELIVERY!
## Table 1: Features of 2,400-bps Modems

<table>
<thead>
<tr>
<th>Modem</th>
<th>List price</th>
<th>Comments</th>
<th>Speeds (bps)</th>
<th>Standards supported</th>
<th>Error correction</th>
<th>Data compression</th>
<th>Features</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor Automation 2455 MacPac</td>
<td>$349</td>
<td>Average performance.</td>
<td>300, 1,200, 2,400</td>
<td>Bell 103, 212A</td>
<td>MNP 4</td>
<td>MNP 5</td>
<td></td>
<td>Quicklink II 1.1.3</td>
</tr>
<tr>
<td>Applied Engineering DataLink Express</td>
<td>$299 ($349 with tax)</td>
<td>Slow, limited software. May have trouble with some on-line services.</td>
<td>300, 1,200, 2,400</td>
<td>Bell 103, 212A</td>
<td>MNP 4</td>
<td>MNP 5</td>
<td></td>
<td>Terminal 1.5</td>
</tr>
<tr>
<td>Computer Friends Lightspeed 2400LE</td>
<td>$159</td>
<td>Lowest price. Fastest MNP 5 modem. Best buy.</td>
<td>300, 1,200, 2,400</td>
<td>Bell 103, 212A</td>
<td>MNP 4</td>
<td>MNP 5</td>
<td></td>
<td>Quicklink II 1.1.3</td>
</tr>
<tr>
<td>Hayes V-series Smartmodem 2400</td>
<td>$699</td>
<td>Fastest modem. Expensive. Easy-to-use software and manuals.</td>
<td>300, 1,200, 2,400</td>
<td>Bell 103, 212A</td>
<td>MNP 4</td>
<td>MNP 5</td>
<td></td>
<td>Smartcom II Mac, Hayes Connect</td>
</tr>
</tbody>
</table>

### Features
- Synchronous communication
- Password, callback
- Encryption
- Remote configuration
- Self-tests
- Fix option

### Accessories
- Hardware-flow-control cable
- Bundled software

### Controls
- Front-panel controls
- Rear-panel controls
- Status lights
- Data-pump supplier
- Size (W x D x H, in.)
- Warranty

---

*V.42 incorporates MNP 4 error correction.*
Since it was introduced, our ULTRA 96 has become the fastest-selling Hayes modem ever.

Not only because the move to high-speed modems is in full swing, but because no other 9600 can deliver the features, performance, and networking capabilities of the fully loaded ULTRA 96.

ULTRA 96 provides up to 4-to-1 data compression, so it can save you money by letting you run computer equipment at its maximum speed.

In fact, you'll save so much on long-distance charges, your ULTRA 96 will pay for itself in just a few months.

It's available bundled with HayesConnect™ network server software, so any user on an AppleTalk® network has access to ULTRA™ performance.

Of course, ULTRA 96 also works on dial lines, leased lines, and satellite links, and it's ideal for AppleTalk bridges. It even automatically negotiates the best connection with other modems, Hayes or otherwise.

Plus, it uses the world standards for error-control and data compression, V.42 and V.42bis, and it can downshift to MNP® levels 2 through 5.

What's more, ULTRA 96 is compatible with the most popular high-speed modem on the market. The Hayes V-series™ Smartmodem 9600™

And with its low sticker price, you'll also find it compatible with your budget.

For more information about ULTRA 96, call 1-800-635-1225.

We think you'll find it to be the ultimate communications machine.

Hayes Our technology has the computer world talking. More than ever.

Please circle 417 on reader service card.

At 38,400 bps, and the way it runs on the network, no other modem can keep up with it.
# Table 1: Features of 2,400-bps Modems, continued

<table>
<thead>
<tr>
<th>Modem Brand</th>
<th>Features</th>
<th>Controls</th>
<th>Accessories</th>
<th>Hardware-flow-control cable</th>
<th>Bundled software</th>
<th>Status lights</th>
<th>Data-pump supplier</th>
<th>Size (W x D x H, in.)</th>
<th>Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel 2400EX MNP-Macintosh</td>
<td>Average performance. Limited software. Good warranty.</td>
<td>none</td>
<td>QuickLink II 1.1.3</td>
<td>5.5 x 9.6 x 1.5</td>
<td>5 years</td>
<td>Intel Corp. 5200 N.E. Elam Young Pkwy. Hillsborough, OR 97124 (603) 638-3373</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirror Technologies DM2405</td>
<td>Low price includes optional $75 upgrade to Micro/Phone II 3.0.</td>
<td>none</td>
<td>Micro/Phone 1.5</td>
<td>5.5 x 9.6 x 1.5</td>
<td>1 year</td>
<td>Intel</td>
<td>Mirror Technologies, Inc. 2644 Patton Rd. Roseville, MN 55113 (612) 633-4450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prometheus ProModem 2400M Plus</td>
<td>Easiest package to install. Average performance.</td>
<td>none</td>
<td>MacKnowledge 2.0</td>
<td>5.4 x 11.4 x 2.4</td>
<td>2 years</td>
<td>Rockwell</td>
<td>Prometheus Products, Inc. 7225 S.W. Bonita Rd. Tigard, OR 97223 (503) 624-3571</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoom Telephonics Zoom/Modem V.42bis</td>
<td>Excellent performance and price. Limited software.</td>
<td>none</td>
<td>ZTerm 0.85</td>
<td>5.4 x 11.4 x 2.4</td>
<td>2 years</td>
<td>Zoom Telephonics, Inc. 207 South St. Boston, MA 02111 (800) 631-3116 (617) 425-1072</td>
<td>5 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*V.42 incorporates MNP 4 error correction.*
Click, It's A MAC.

Load SoftPC, click twice, and you've got a window wide open to the entire MS-DOS world. Everything a Mac can do plus everything a PC can do, in one machine.

Whether you're a Macintosh user who needs access to PC software and data, or a PC user who wants to go Macintosh without losing PC compatibility, you can have it all with Insignia's best-selling software solutions.

SoftPC is a software emulation precise enough to run the highest PC applications—Norton Utilities, Lotus 1-2-3, Harvard Graphics, AutoCad, even custom development programs. You get complete XT or AT compatibility for the SE/30, Macintosh II family and the Macintosh Portable.

Add an EGA/AT Option Module, and get vibrant EGA color compatibility, LIM expanded memory and math coprocessor support.

New AccessPC lets you use PC and PS/2 disks just like Mac disks. Now you can move and view PC file and disk icons—even in locked or full disks!—format DOS disks, launch Mac applications and much more.

For more information and the name of a SoftPC dealer near you, call Insignia at 800-848-7677 (U.S. only) or 408-522-7600 (outside U.S.).

Insignia Solutions. Inc. 254 San Germinio Wuy Sunnyvale, CA 94086. Fax: 408-733-9541. We give a SoftPC (retail $399) or AccessPC program (retail $129) daily to a caller selected at random.

SoftPC is a registered trademark and AccessPC is a trademark of Insignia Solutions, Inc. Other product names are trademarks or registered trademarks of their respective owners.

Please circle 152 on reader service card.
Until now this age-old annual problem had two solutions:

You'd either pay someone lots of money to do your taxes. Or suffer through doing your taxes yourself, and end up wishing you'd paid someone to do them.

Introducing the third and better option.

TurboTax.* The tax preparation software designed for your Macintosh,* that's like having someone to help you, and hold your hand while you prepare your own taxes.

While it knows all the tricks of an accountant, it incorporates the care that only you can have for your hard-earned money.

It guides you through preparing a tax return step by step. More than 60 commonly used forms, schedules and worksheets are included.

If you run into tough tax terminolgy, TurboTax will use a hypertext format to translate it into easy English.

It lets you try various tax scenarios to maximize your refund. Declare a stock loss, for example. Depreciate income property. Or try a different W4 deduction for next year's return.

TurboTax guides you in categorizing and filing more than 90 types of expenses and income. Then proofs your return in over 250 areas to help ensure no mistakes in logic, calculation, or any missed savings opportunities slip through.

It'll even help you sleep at night.
Tables showing the percentage of the returns audited for the amounts you're claiming can be used as a safety check. So there's little worry that anything on your return might flag the IRS. All the number crunching is done in under 5 seconds. Then, when you're finished, you can print out and mail in your return right off your computer.

When you spend about $89 for our program, you're part of a program. Because TurboTax is offered to you every year after at half price.

If you would like to try our award-winning tax preparation software, drop by your software store, or call us at (800) 755-8829.

Ask about the whole family of ChipSoft products, including our 10 interfaceable State Programs and an Electronic Filing Option.

You'll find out why over 3 million returns were prepared with TurboTax last year alone. Or, for that matter, why more PC users use TurboTax than any other tax software.

Please circle 82 on reader service card.

Now TurboTax has come to the Macintosh.

And, for even more people, thankfully, taxes will never be the same again.
Surrounded by UNIX machines from Sun, DEC, Hewlett-Packard, Big Blue, and who knows what's NeXT? Teach your Mac industrial-strength UNIX.

By Alexis Rosen, Jeff Pittelkau, and the MacUser Labs Staff

Apple has finally delivered a UNIX system — A/UX — that's as elegant as the Macintosh, just in time to make the Macintosh a full partner in the workstation revolution. If you're a Mac loyalist lost amid UNIX workstations from Sun Microsystems, IBM, and others, you can now run with the crowd without giving up your Mac. And if you're a veteran user of the ubiquitous UNIX operating system — it dominates government, university, and scientific computing — and have always coveted the Mac's vast array of software, now is definitely the time to test-drive A/UX. MacUser Labs has been using and testing the new A/UX 2.0 for the past few months, and it easily meets or exceeds nearly all our expectations.
The original A/UX, version 1.0, introduced in February of 1988, was plagued with countless UNIX bugs and could run only one Mac application at a time — if you were lucky. Even the Mac's Finder wouldn't work. For example, instead of being able to dump unwanted files into the intuitive Trash, you were forced to type the UNIX `rm` command into a basic text interface — shades of the dreaded DOS. To run most of your favorite applications and UNIX on the same Mac, you had to restart the Mac every time you wanted to switch between the Mac operating system and UNIX. And compared with other UNIX systems, Macs running A/UX were sometimes painfully slow.

Today, with A/UX 2.0, all the serious bugs and incompatibilities have been fixed. Switching between Mac and UNIX programs is now as easy as clicking in a window. Mac applications can coexist with the UNIX command-line and X Window (a graphical-user interface standard for UNIX) programs, all in their own windows, and with the appropriate software (Insignia's Mac program SoftPC, for example), A/UX can even provide full DOS emulation.

**UNIX According to the Mac**

A/UX is a strong, clean port, with superb integration of different UNIX environments. It's a true System V Release 2.2 version of AT&T's UNIX — an enhancement of mainstream UNIX but not the most advanced version available. A/UX also supports most of the 4.3BSD (Berkeley Software Distribution) features — among them the indispensable job control. In addition, A/UX supports some parts of System V Release 3, such as streams (a programming interface), and includes all three standard UNIX command-interpreter shells (Bourne, Korn, and C) and many useful programs beyond the basic distribution (see the "A/UX for the UNIX Expert" sidebar).

A/UX starts up as a multiuser environment only, and after logging in your user name, you'll see the MultiFinder desktop. To do UNIX things, you switch to CommandShell, an application that starts up automatically. CommandShell is a multiwindow terminal emulator, much like the console or shell tools on typical UNIX workstations.

**Figure 1: A/UX Performance**

![Figure 1a: Mac-Application Performance Under A/UX 2.0](image)

Most Mac applications run more slowly under A/UX, especially in the stock 4-megabyte RAM configuration; adding more RAM to the Mac IIx helped substantially. Our 4th Dimension sort test, however, was able to take advantage of A/UX's memory buffer; consequently, 4th Dimension ran much faster under A/UX than under System 6.0.5 (the 100-percent line represents System 6.0.5 performance under MultiFinder). Although at press time, 4D was not fully compatible with A/UX, we tested it because its database manipulation is performed mostly in RAM. Using 8 megabytes of RAM and increasing the A/UX memory buffer from 10 percent to 25 percent helped even more.

![Figure 1b: A/UX Performance with Additional RAM](image)

Adding RAM beyond Apple's 4-megabyte base configuration can significantly improve A/UX performance (the 100-percent line represents A/UX performance with 4 megabytes of RAM and a 10-percent memory buffer on the Mac IIx). In particular, our multiple-edits test, which ran ten small editing tasks simultaneously, shows the need for more RAM for support of multiple users. Note that the edit-2-megabyte-file test has a big jump in speed between the 8-megabyte and 20-megabyte RAM configurations (both had a memory buffer of 25 percent); this occurs because A/UX stops using slower, disk-based virtual memory as soon as sufficient RAM becomes available.
CommandShell windows can be resized up to the limit of your screen, can use fonts in any size, and can remember the session so you can scroll back. You can copy or paste text among windows and other applications. If you start a lengthy operation in one window, you can open other windows and work in them while the first task is executing.

A simple Mac text editor called TextEditor (actually derived from the Macintosh Programmer's Workshop) comes with A/UX. It has just enough power to do the job, besides fulfilling its purpose of replacing vi in the hearts of UNIX hackers everywhere. Because TextEditor is much easier to use than vi, you'll probably find yourself using it for editing small shell scripts and source files.

A/UX provides a translation layer that makes the A/UX file system look like a Mac file system, visible to all Mac applications. Mac programs (such as TextEditor) can manipulate UNIX files, and you can drag UNIX files in the usual way onto Mac disks. You can keep Mac files in the UNIX file system and use them normally from Mac programs, but Mac disks are not available to UNIX programs.

**Driving A/UX for the First Time**

The required platform for A/UX 2.0 is a Mac II with an optional PMMU (Paged Memory Management Unit) chip or any Mac based on the Motorola 68030 chip (which has built-in memory management). Apple specifies a minimum of 4 megabytes of RAM as well as an 80-megabyte hard-disk drive to obtain adequate A/UX performance, but see the "Setting Up an A/UX System" sidebar for our preferences.

A/UX starts up when you double-click on an application called, simply enough, A/UX Startup. This application can launch automatically or provide you with a command-line window for performing diagnostic and maintenance tasks. Once A/UX has started, the Mac can simultaneously act as a UNIX workstation and display the active MultiFinder desktop.

But you'll notice some changes to the Mac environment. The UNIX boot disk mounts first with the name / (as is normally true for any UNIX file system); all other A/UX volumes mount inside directories (folders).

---

**Figure 1c: A/UX Performance with a Faster Hard-Disk Drive**

By purchasing a large, fast hard-disk drive and installing A/UX yourself, you can realize a significant performance boost over the preconfigured 80-megabyte Quantum drive Apple sells. The 100-percent line represents A/UX performance with the stock Apple Internal 80SC hard drive, using 8 megabytes of RAM and a 25-percent memory buffer on the Mac llfx. The MicroNet 404-megabyte drive offers higher sustained data throughput and shorter average seek time than the Quantum drive we tested.

**Figure 1d: A/UX Performance Without Mac Operating System**

We ran UNIX tests on our tuned llfx system with and without the Mac environment. When the Mac OS wasn't active, we saw an average 10-percent increase in UNIX performance ("console only"). The 100-percent line represents A/UX performance with both UNIX and Mac operating systems active, using the stock Apple Internal 80SC hard drive and 4 megabytes of RAM (with a 10-percent memory buffer) on the Mac llfx. As our 4-megabyte results show, the lower the available RAM, the more the presence of the Mac operating system costs you in performance.
Then individual users' home folders appear, followed by other Mac partitions and disks (this version of A/UX 2.0 can mount only the first Mac partition on each disk). UNIX sessions happen inside CommandShell, which supports up to 16 simultaneous sessions in addition to a system-console window.

For users familiar with the Mac's point-and-click simplicity, the UNIX text-command interface (command line) may seem intimidating. A/UX 2.0 has a solution called commandos, available for almost all the common UNIX commands and for various system-configuration scripts. On the command line, you can type a command you'd like to use, such as ls (which lists files and their attributes). But instead of typing the rest of the options, such as file ownership and access privileges, you can press Command-K, after which a dialog box appears. There you can click on appropriate radio buttons and check boxes—with real-time help to guide you. When you've finished, clicking on the highlighted Is button (or pressing the Enter key) generates a syntactically correct command line.

### The Mac According to UNIX

A Mac running A/UX 2.0 looks a lot like a regular Mac. MultiFinder is standard, the desktop works normally, and most applications behave in the usual way. Most Mac users don't even realize that A/UX is running.

There are a few twists, though. Thanks to the magic of virtual memory, which uses the Mac's memory-management capabilities and temporary swaps to the hard disk, A/UX can increase memory (yielding up to 16 megabytes) provided to the Mac environment from the available RAM. For all UNIX functions, virtual memory is limited only by the swap partition's size on the hard disk or by the A/UX ceiling of 4 gigabytes. Even more, multiple users would quickly bog down an A/UX station that depended too much on (slower) virtual memory instead of RAM.

MultiFinder with A/UX is a little nicer than MultiFinder without. It lets you hide all of an application's windows with a single menu choice, and the application's windows reappear when you choose the application from the Apple menu. Alternatively, you can hide everything except the current application if you want to tidy up your desktop temporarily. This is particularly useful when you're looking for an icon on the desktop and an application's document windows are in the way. A/UX DA's each have their own MultiFinder layers, as in version 7.0 of the Mac operating system.

To start working with A/UX, you must log in with a user name and password so the Mac knows who you are. This lets the Mac maintain separate System Folders for each user—which means that when you customize your Mac with a zillion INITs and type fonts, you won't annoy any colleagues who also use that machine.

One slick extension to the A/UX MultiFinder is its way of showing your access rights to various files. UNIX lets you protect each file in a variety of ways; for example, some personal UNIX files are readable by everyone but writable only by the files' owners. A/UX translates these protections into the equivalent AppleShare access privileges (which have been extended in some minor but logical ways) and uses the standard AppleShare interface.

---

**What Is UNIX, and Why Should You Care?**

Most Mac users don't think about computer operating systems. For better or for worse, Macs make it easy to forget about such complicated things. But, as do other computers, the Mac does have an operating system.

The Mac OS code lives mostly inside the ROM (read-only memory) chips, but big parts of it live inside the System file, kept in the System Folder along with the Finder and MultiFinder files that create the familiar desktop. The OS provides various services to user programs such as word processors. These services manage menus, disk files, memory, windows, and so on. MultiFinder is an extension to the OS that provides another level of services: a multiple-program manager and a window-layer manager, among other things.

So what is UNIX? It's simply another OS. It corresponds roughly to the Mac ROMs and System file or to DOS. UNIX has a few properties that distinguish it from the OS pack, however.

From its very first moment, UNIX was designed to be a multitasking system, serving many users simultaneously. It was designed to appeal to technical users by providing their most desired features. It was written in C, a high-level language. Most important, its authors didn't restrict it to a single type of machine (although UNIX remains a registered trademark of AT&T, its primary developer).

Early users, almost all of them programmers, added a huge assortment of software tools, which generally worked well together.

Thus UNIX became a rich software environment, attracting even more-technical users. Because it was written in a convenient language (unlike many other operating systems) and because it was relatively unrestricted, UNIX quickly developed many versions that moved to an incredible number of different machines. Today it is almost impossible to find a computer that can't run a version of UNIX. It's available for everything from IBM PS/2s to Macs to Cray supercomputers.

The wide availability of UNIX on many workstations has made it the OS of choice for many high-tech programs such as those for advanced CAD or mathematical modeling. UNIX systems are also the dominant choice for the fast new RISC (Reduced Instruction Set Computer) workstations.

If you work in an environment with a lot of UNIX machines (an increasingly common situation), having UNIX on your own Mac can make communication—such as printer, mail, news, and disk sharing—with other computers relatively easy. Equally significant is access to the vast computational power of UNIX hosts, specialized software, and networks.

If your company has a custom-developed program written in UNIX, you might need to have a computer other than a Mac at your desk. But if you have a Mac with version 2.0 of A/UX installed, you'll get the benefits of the Mac OS and UNIX simultaneously.
give NewLife™
to your old mac

NewLife 1
- CPU upgrade for the Mac 128K, 512K and 512Ke
- 20% faster than a Mac Plus
- SCSI port for hard disk drives
- 8 SIMM sockets allow up to 4Mb using 256K and 1Mb SIMMs

NewLife 2
- CPU upgrade for the Mac 128K, 512K and 512Ke
- Connect a larger monochrome monitor to your system
- Lets your Mac run current software
- 20% faster than a Mac Plus

NewLife 25Plus
- 68030 accelerator and 68882 math co-processor running at 25 MHz for the Mac 128K, 512K, 512Ke and Plus
- yielding Mac IIci performance levels

NewLife 25SE
- 68030 accelerator and 68882 math co-processor running at 25 MHz for the Mac SE
- yielding Mac IIci performance levels

NewLife SE video display interface card
- add a low-cost larger monitor to your SE system
- flexible connectorization scheme supports most PC and Mac monitors

... and for the ultimate in computing power,

NewLife 33 SE
- accelerator running at 33 MHz for the Mac SE
- performance in the Mac IIfx class
- these ... at a fraction of the cost

So take that old Mac out of the closet and put it back to work with today’s software.

Toll free: (800) 267-7231
Telephone: (613) 592-5080
Fax: (613) 592-1320

Newbridge Microsystems,
603 March Road,
Kanata, Ontario, Canada
K2K 2M5

NewLife™ is a trademark of Newbridge Microsystems. Other brand and product names are trademarks of their respective holders. © 1990, Newbridge Microsystems. All Rights Reserved.

Please circle 370 on reader service card.
To be truly compatible with A/UX (and eventually Mac's System 7.0), applications must be "32-bit clean" — which is the case for nearly all popular Mac applications. As time passes, this will be less of an issue. For programs that are not 32-bit clean, A/UX allows a 24-bit session that runs them with a few restrictions.

With INITs, compatibility is currently a big problem, although things are getting better. By the time you read this, many of the most popular commercial (but not necessarily public-domain and shareware) INITs will have been updated. Apple and its A/UX-authorized dealers distribute a list of programs and hardware known to work with A/UX 2.0 called A/UX 3rd Party Product Guide; the list is also downloadable by AppleLink subscribers.

**Basic Installation**

Apple's introductory booklet *Road Map to A/UX* is one of those rare gems that spans the experience range — it's helpful to UNIX neophytes and A/UX aficionados alike. Start by reading this booklet from cover to cover.

Apple now sells A/UX on four media: on floppies, on tape, on CD-ROM discs, or preinstalled on external or internal hard-disk drives. You can use the preinstalled version as soon as you turn on the hard-disk drive. All other versions must be installed onto your existing hard disk. The installation procedure is identical for each type of medium; if you install from 1.4-megabyte floppies, however, you might fall asleep while inserting all 40 of them, one after another, into the Mac.

Unfortunately — and it's very unfortunate — the only tape format supplied for installation is for the slow Apple Tape Backup 40SC, a 40-megabyte drive that came in last in our December '89 report "Getting It On Tape," page 189.) This leaves the CD-ROM discs or the pile of floppies as the realistic installation alternatives for people who already own Macs or who don't want Apple hard drives. If you need a tape drive to back up after installation, see the A/UX 3rd Party Product Guide, which lists larger-capacity alternatives.

Normally, installation of the basic A/UX system from CD-ROM discs takes about one and a half hours, and the Mac spends most of that time loading A/UX automatically onto the hard drive (requiring little user attention). The manual, *A/UX Installation Guide*, is in the typically excellent Apple style, with key sections clearly labeled.

The only tricky part is correctly partitioning your hard-disk drive before installing A/UX. If you are using standard Apple equipment (an 80- or 160-megabyte hard-disk drive) and you want a standard setup, it's very easy to do. As the manual explains, you just run the HD SC Setup program to prepare your disk drive for A/UX. This takes just a few mouse clicks and a few minutes' wait. But if you're not using a standard Apple disk or partitioning scheme, you'll have to do some extra work (see the "A/UX for the UNIX Expert" and "Setting Up an A/UX System" sidebars).

---

**A/UX for the UNIX Expert**

Warning: You're entering an area in which your command of the English language may be of little value, because UNIX-system administrators use a rich alphabet soup of acronyms when describing UNIX compatibility and functionality.

In essence, A/UX 2.0 is a complete software translation of AT&T UNIX System V Release 2.2. Digging deeper, A/UX is compatible with the following standards:

- AT&T SVID (System V Interface Definition).
- ISO 9945-1.
- FIPS #151-1.

In addition to the System V base, A/UX incorporates most of the features of Berkeley Software Distribution 4.3BSD (developed at the University of California, Berkeley), such as

- FFS (the Fast File System).
- Real job control (with the Korn or C shells).
- Ipr print spooler.
- BSD libraries and C-compiler compatibility switches.
- Source Code Control System.
- Many programs in /usr/cbin, such as finger and compress.

A/UX provides a wide variety of Ethernet software, including

- Basic TCP/IP services such as TELNET and FTP.
- Berkeley B-Net: login, talk, rcp, and so on.
- NFS 3.2 with Yellow Pages, including server capability.
- Sendmail 5.61.

A/UX comes with SLIP (Serial Line Internet Protocol) software. It also supports serial-line access with kermit, cu, and tip. Serial-port log-ins are supported normally. All the A/UX serial software, including getty, respects UUCP (UNIX-to-UNIX Copy Protocol) locking files.

UNIX support for LocalTalk is limited to printing: lpr is for spooling, and atprint is for immediate output. PostScript printing is strongly supported, with tools such as transcript.

In addition to its UNIX capabilities, A/UX provides a nearly complete Mac environment, including MultiFinder and System 6.0.5. All 32-bit-clean Mac programs run if they don't use supervisor-mode instructions or the few missing parts of the Mac Toolbox, meaning that almost all the most popular Mac applications run.

A/UX offers Mac OS-software support for LocalTalk and EtherTalk and can support either protocol simultaneously with TCP/IP services or with Ethernet.

Although A/UX is remarkably complete, it does have a few holes. One of the most glaring problem areas, UUCP, is an ancient UNIX System V version with many bugs. Some of the support programs do not work, and the sendmail configuration file does not work properly.

A/UX supports networking extremely well, but we'd really like to see it have easy Mac-style network administration. Likewise, there is fairly strong support for security but no single configuration command to make a system secure (or insecure).

It uses an asynchronous SCSI manager that differs from the
Performance

A/UX is a very solid UNIX system — unless your work requires lots of UNIX computing power on your desktop. Then you’ll have problems with Mac hardware performance. Currently, the IIfx is the fastest Mac you can buy. When running A/UX, it can’t provide the UNIX speed of the average workstation (such as the Sun SPARCstation 1+). So if you’re a professional programmer who already waits too long for big compiles to finish or if you’re an engineer who spends your life inside a CAD program, you might find A/UX on the IIfx too slow.

Other users will find the IIfx fast enough, however, and many will also consider the new IIsi fast enough. And if all the heavy-duty work in your office is done by a central server — perhaps the departmental Cray supercomputer or (more realistically) a high-end RISC (Reduced Instruction Set Computer) machine such as the IBM RS/6000 — the Mac’s performance may be less of an issue and A/UX can still be a good option.

Mac’s. As a result, some peripherals (such as optical scanners) that use the Mac’s synchronous SCSI calls won’t work under A/UX unless you create a custom software driver (following the guidelines in the Apple document Writing A/UX Device Drivers). However, most peripheral devices such as LaserWriters are LocalTalk or serial devices, which are fully supported under A/UX.

File Systems

A/UX 2.0 supports three file systems — SVFS (System V File System), FFS, and HFS (Hierarchical File System) — and three Mac file formats — UNIX, AppleSingle, and AppleDouble. UNIX disks can come in two formats: SVFS and FFS (sometimes called UFS). FFS is a much better way to format disks, and it’s the default in A/UX 2.0. But SVFS is still supported, and any disks made with A/UX 1.1.1 (or earlier) are in that format. If you have any disks in the SVFS format, you should convert them to FFS format (but make sure you have a backup!) to improve performance.

MultiFinder, like other Mac programs, sees the UNIX file system (FSS or SVFS) as just another part of the Mac’s HFS. But there’s a lot of magic going on behind the scenes to make this work. The magic can make some disk operations slower on a UNIX disk than on an equivalent Mac disk. In particular, looking through directories (folders) is much slower. On the other hand, operations with single files can be somewhat faster, because the A/UX disk cache works better with UNIX disks.

If you do put Mac files onto the UNIX file system, they can be in one of two formats. Every Mac file has two parts — the resource fork and the data fork. The default format on UNIX disks, AppleSingle, combines both forks into one UNIX file. This is convenient, but performance when using AppleSingle files or programs can be poor, as the format translation magic has to work much harder. The alternative is to use the AppleDouble file format.

A Mac file in AppleDouble format is separated into two separate files. One file contains the data fork and has the same name as the original file; the other file contains the resource fork and has the same name except for a % at the beginning. For example, MyMacFile would be stored in AppleDouble format as MyMacFile (the data-fork file) and %MyMacFile (the resource-fork file). There is virtually no performance loss when you use files stored in AppleDouble format.

One important problem with AppleDouble files is that it’s very easy to lose one of the two pieces if you forget about it when you move the file at a later date. A program needs both forks of the file to work.

Apple provides a UNIX tool, fcvt, that translates between AppleSingle and AppleDouble files. It also handles other common formats, such as MacBinary, plain triple, and binhex. You can learn more about this useful tool by reading the on-line manual (type man conv in a CommandShell window).

Sometimes there are good reasons to put Mac files onto UNIX disks. If you do, be aware of the performance issues and consider using the AppleDouble format.
Setting Up an A/UX System

**Which Mac?**

Once you’ve decided on A/UX, the first question is easy — which Mac should you use? A Mac IIx, SE/30, or Mac IIfx can run A/UX, but we found them to be painfully slow for all but the lightest use.

The Mac IIfx is reasonably fast, especially for disk-related tasks. It still can’t compare to a RISC-based workstation, though. By press time, we weren’t able to run A/UX tests on the new Mac IIsi, but we believe that its performance falls somewhere between that of the Mac IIfx and the IIfc.

The fast Mac IIfx is the clear choice for A/UX tasks, but considering its speed relative to the IIfc under the Mac OS, the IIfx running A/UX was slower than we expected. This is mainly because A/UX makes poor use of the IIfx’s fast SCSI hardware. Apple is working on this problem, and we have already tested the improved A/UX 2.0 that speeds up IIfx disk performance.

**How Much Memory?**

Once you have a Mac, you need memory. Our tests show clearly that you pay a tremendous penalty for running with only 4 megabytes of RAM. If you can, you should have at least 8 megabytes of installed RAM. If your Mac will support multiple users or will do a lot of UNIX work, 20 megabytes is the optimal configuration. In most cases, the extra money needed to reach the IIfx’s maximum 32 megabytes would be better spent on a bigger, faster hard-disk drive.

The A/UX memory-buffer cache interacts with all read/write disk operations and is more efficient than the Mac’s Control Panel RAM cache, so you should deactivate the Control Panel cache under A/UX. We found that setting the A/UX memory-buffer cache to 25 percent instead of the default 10 percent improved performance (see “A/UX Performance with Additional RAM,” Figure 1b).

**Which Disk Drives?**

The 80-megabyte hard-disk drive that Apple supplies with Macs is not a particularly fast drive. Furthermore, 80 megabytes is inadequate for any serious UNIX work. If you can afford to purchase the CD-ROM version of A/UX and a suitable CD-ROM drive, this would be the preferred medium (see the “Capsule Review” sidebar). But don’t even think of running A/UX from the CD-ROM disc itself. If you can’t afford to go to the CD-ROM route, buy the floppies and a big, fast third-party hard drive.

If you must have an Apple hard-drive disk, you’ll find the 160-megabyte drive acceptable. Another possibility is a large Seagate/Imprimis hard drive, which offers the necessary high data-transfer rates and low seek times. We obtained excellent performance with a variety of these.

Many third-party hard-disk drives don’t come with software that can format them for use with A/UX, but La Cie’s Silverlining can format most manufacturers’ drives for A/UX. We have also used the MicroNet formatter and drives with excellent results.

The optimal mixed Macintosh and A/UX system would have A/UX and Mac partitions on each of two hard disks, for even sharing of the disk-access load. Place the UNIX root-file system and disk-swap partition (for virtual memory) on the faster disk. The A/UX root partition should be at least 100 megabytes, with a 16-megabyte-to-32-megabyte virtual-memory swap, and the optional Eschatology partition (which backs up critical files for hard-disk auto-recovery) set at 4 megabytes.

**Which Backup Device?**

Any backup device capable of backing up your entire hard disk, entire A/UX partitions, or entire SCSI partitions can handle A/UX backups. If you wish to back up incrementally, or file by file, you can use UNIX utilities such as tar (A/UX-compatible drivers are required); the A/UX Commando facility simplifies this process. Currently, you can do backups of an entire disk only when A/UX is not running.

Several companies, including FWB and MicroNet, provide custom driver software for DAT (digital audio tape), TEAC, and other backup drives for A/UX. DAT would be a superb but expensive option. A/UX-compatible erasable optical drives would likewise be expensive, but among their advantages (see “Erasable Optical Drives,” November ’90, page 102) would be their potential ability to start up your Macintosh from a “mirror image” backup of your hard disk if your drive ever dies.

At press time, FWB, Inc., had introduced additional A/UX drivers for its entire line of hard-disk drives and tape drives. The custom drivers can also operate devices from many other vendors. Special features include multithreaded disconnect/reconnect, allowing simultaneous access to six SCSI tape drives.

**Which Monitor?**

We have used a wide variety of 1-bit-to-8-bit monitors with no glitches. A/UX fully supports 32-bit QuickDraw, so you should have no problems with the Apple 8•24 and 8•24 ee graphics cards or third-party 24-bit cards such as SuperMac’s Spectrum/24 Series III, and many others. Consult Apple’s updated A/UX-compatibility list before purchasing a third-party monitor, video card, or graphics accelerator.

**Which Ethernet Card?**

A/UX has built-in support for AppleEthernet NuBus cards. Similar cards from Asanté, Racal Interlan, and Cayman are faster, often cheaper, and equally well-built (see “300 Best Network Products,” June ’90, page 139). Ethernet cards are available for both NuBus slots and slots for the SE/30, in 10BASE-2 and 10BASE-T formats. Setting up Ethernet takes less than an hour. Just power down, install the card, power up, and answer the questions in the newconfig program before restarting. You need to give the Mac a name and address plus the names of the other machines in the network.

**Which Serial-Port Board?**

If you use more than two serial ports, you’ll need an expansion card. We’ve used the Taniwha Systems CommCard for more than a year. It works well, comes with built-in support for the ULCP g protocol, and works with the Macintosh Communications Toolbox; support is excellent. Other manufacturers also provide serial-port boards.

**Which Mouse?**

Many UNIX programs require a three-button mouse, and the only way to mimic one with the standard Apple one-button mouse (or an equivalent trackball) is to perform keystrokes simultaneously with the mouse click. As A/UX takes hold in the UNIX market, hardware vendors will offer a variety of A/UX-compatible three-button mice. For now, we can recommend the new three-button SuperMouse/GMPU combination from Advanced Gravis (Burnaby, British Columbia, Canada).
A/UX 2.0 gives you easy access to the common networking environments of UNIX and the Macintosh.

TCP/IP
A/UX supports standard TCP/IP (transmission control protocol/Internet protocol) communication over Ethernet to other UNIX computers. To use TCP/IP, you need to install an Ethernet card in your Mac and configure it as a TCP/IP node. A/UX supports networking protocols commonly available on UNIX machines, including NFS (Network File System) for sharing files, TELNET for remote log-ins, and SMTP (simple mail transport protocol) for sending and receiving mail.

AppleTalk devices on Ethernet network
- AppleShare server with Ethernet card
- LaserWriter
- Mail server with Ethernet card

AppleTalk
A/UX provides AppleTalk connectivity over LocalTalk or EtherTalk networks, plus it has an IP (TCP/IP or SLIP) connection. When both an Ethernet card and a LocalTalk connecter are installed, you can choose between networks by using the Network cdev and then restarting your computer.

Once you've selected an AppleTalk network (and a zone in the Chooser), you can select AppleShare servers and AppleTalk printers, including the LaserWriter, AppleTalk ImageWriter, and ImageWriter LQ. The A/UX lpr utility prints to the current Chooser-selected printer. At press time, no E-mail client software package, including QuickMail and Microsoft Mail, was compatible with A/UX 2.0. Until such software is compatible, you need a gateway to SMTP to send and receive mail between your A/UX Mac and the mail server.

AppleTalk devices on LocalTalk network
- AppleShare server
- LaserWriter
- Mail server

SLIP
If you're planning to use A/UX in a stand-alone or non-Ethernet environment, your A/UX Mac can talk to other A/UX Macs and UNIX computers by using a serial connection (either locally or via modem) and SLIP (Serial Line Internet Protocol).
Apple is planning a top-of-the-line Mac based on the Motorola 68040; this future Mac should be able to compete with low-to-midrange UNIX workstations, including those from NeXT Computer.

As configuration is a complicated issue, it’s difficult to make safe comparisons with other UNIX workstations, but subjectively speaking, a decently configured IIfx with A/UX (see the “Setting Up an A/UX System” sidebar) seems as fast as the lower-end RISC boxes, such as the Sun IPC. However, a large part of the perceived speed of the Mac comes from its finely-tuned human interface, which is generally superior to (and feels faster than) other graphical user interfaces for UNIX.

**Connectivity**

A/UX provides standard LocalTalk functionality, so shared printers and file servers are available as usual. The normal Chooser DA offers the usual icons in its dialog box (LaserWriter, AppleTalk ImageWriter, AppleShare, and so on). If you regularly receive large amounts of data over LocalTalk (perhaps from a file server) on anything less powerful than a Macintosh IIfx, however, A/UX’s performance will suffer drastically.

If your Mac has an Ethernet card, it can use EtherTalk (Phase 2 only) to communicate with any other EtherTalk device on the network, without disrupting A/UX in any way. To switch between LocalTalk and EtherTalk, you need to make a few basic tweaks and then restart the computer.

A/UX is able to employ LocalTalk...
For ten years, GCC Technologies has been committed to producing only products that we ourselves aspire to own. Now, to commemorate that decade of commitment, we're offering a limited-time $100 factory-direct rebate on our latest innovations: the GCC laser printers.

Get $100 back on the best PostScript® printer on the market at any price: the Business LaserPrinter™ II (BLP™ II). With true Adobe® PostScript, AppleTalk, two megabytes of RAM, SCSI port, high-speed processor and much more, all for an incredible $2299®. For even heavier print loads, choose the BLP IIS for 8-page-per-minute performance rivalling the IINTX at less than half the cost: just $2799®.

If you don't need PostScript, but you still want razor sharp laser output, pick the printer that won this year's MacUser Editor's Choice Award: the Personal LaserPrinter™ II. With its high-quality outline fonts, you get amazingly crisp, clear type that rivals printers costing four times as much. Yet the PLP™ II is just $1299®. And if you need even more power, there's the 8-page-per-minute PLP IIS for only $1799®.

Find out what real innovation can do for your image, and your wallet. Test drive any of these printers at your authorized GCC dealer and we'll give you a free copy of Quick-Envelope, our versatile envelope printing utility. Then, buy a GCC laser printer before January 31, 1991, and you qualify for the $100 rebate. Do it today.

And, celebrate our past with your $100 present.

800-422-7777

GCC TECHNOLOGIES
Peripherals With Vision.

WE'VE DECIDED TO
HAVE A BIG CELEBRATION
AND SEND YOU THE BILL.
connections for printing, but that’s the only instance when its UNIX programs make use of LocalTalk. The lpr print spooler uses the device selected in the Chooser, which can be a LaserWriter on LocalTalk, as its default printer.

For standard UNIX services, you need an Ethernet card and an Ethernet network. Apple provides drivers for its Ethernet card, so Apple’s card or any compatible one (such as Asante’s) works fine. We put a Sun SPARCstation IPC and a NeXT computer onto the same Ethernet network with our A/UX Macs, along with a Macintosh running TCP/Connect II, and they were all able to communicate correctly with each other. The only weakness: A/UX requires a nameserver — a machine on the network that resolves addressing information — to send mail to remote UNIX hosts, including other A/UX Macintoshes.

Apple provides the standard Yellow Pages and NFS (Network File System) software. When you install A/UX, NFS configuration is largely automatic; we installed an A/UX system with NFS and had no problems publishing and mounting from a Sun SPARCstation IPC as well as from a NeXTcube.

Who Needs It?
Most current UNIX users need A/UX, although some don’t know it yet. One good reason to use UNIX is portability; applications developed for one UNIX platform are easy to translate (port) to other systems. However, most UNIX systems come only with basic text editors such as vi and emacs (UNIX is littered with alphabet-soup program names), which are no easier to use than DOS text editors on IBM-compatible PCs. Furthermore, there are few standard UNIX spreadsheet programs to go along with these editors. The complaints that UNIX users must perform to do common productivity tasks, such as write a nice-looking memo, are too painful for most people to bother learning.

With A/UX, however, you’re not faced with these limitations. You have the intuitive MultiFinder for managing UNIX and Mac file systems, and A/UX’s text editor, TextEditor, which is easier to use than the traditional UNIX text editors, such as vi or troff or nroff. You can also run your favorite Mac word processor and cut and paste into a UNIX file. And as you’re working on a Mac, you can switch to Mac applications such as spreadsheet programs and sophisticated database managers and can create video or slide presentations.

A popular alternative solution for making UNIX easier to use is the X Window system, a windowing environment developed at MIT (see the “Alternix” sidebar). X Window is the foundation for various graphical user interfaces (such as AT&T’s OPEN LOOK, which Sun has made popular). However, not all users need the power of a Hewlett-Packard 9000 or a Sun SPARC workstation at their desks, so many UNIX-heavy sites have turned to X terminals as a cheap solution (these machines provide the hardware necessary to display the X Window environment while the real

On the Horizon
One of the promising things about the new A/UX is that Apple has committed to timely updates, the first of which (2.0.1) may ship in the first quarter of 1991. The most important feature of A/UX 2.0.1 will be its support of the Mac IIsi (which Apple plans to configure for use with A/UX) — you’ll then be able to buy a reasonable A/UX platform for a street price of around $4,000. There will probably be other enhancements and bug fixes: a major upgrade of the Korn shell (and awk), taken from the latest AT&T source; support for multiple monitors; fixes to UUCP; improved serial-port drivers; enhancements to CommandShell; Sendmail 5.64 and a working sendmail-configuration file; all the current patches to 2.0, including the iIfx SCSI fix; and more new commands and easy-to-use shell scripts.

At press time, Apple announced that it had joined the two major UNIX consortia: UNIX International and the Open Software Foundation. These rival standards organizations, which Apple had previously rejected, will determine a major part of future UNIX development. How Apple will expand A/UX’s role in the UNIX game while playing on opposing teams remains to be seen.

One of our criticisms of A/UX is that the 2.0 distribution disks don’t contain any of the really good, free UNIX software now available. Lots of folks at Apple are aware of this issue, and it seems likely that a new CD-ROM disc containing all sorts of goodies may be available by the time you read this. The disc would probably contain popular UNIX source programs, with versions fully compiled for A/UX. We expect that it would include news software (such as Bnews, Crews, rn, and nn), tclsh (an extended C shell), and other popular UNIX programs. It will also probably come with GNU software utilities such as emacs, gcc, and gdb.

This CD-ROM disc will probably be sold for the cost of distribution, so start saving up for a Mac-compatible CD-ROM drive if you don’t already have one — it’ll be worth it to have this disk. (See “Most Valuable Players,” March ’90, page 150, for guidance in selecting CD-ROM drives.)

If Apple itself doesn’t take responsibility for providing fast, large-capacity, A/UX-compatible tape-backup drives, we can expect third-party vendors to come out quickly with such drives (and more-adaptable software).

MicroNet has also developed a high-speed SCSI NuBus board. We haven’t tested it with A/UX yet, but based on our experience with it under the Mac OS, it could be just the thing to put new life into an tired old Mac. Other vendors are also working on SCSI boards.

When we prepared this report, some Mac programs — mostly IMITs that we’d rather not live without — still didn’t run with A/UX, although most of them will be able to by the time you read this. CE Software (QuickKeys, QuickMail, and Alarming Events) and Icom Simulations (On Cue II) claim to have A/UX-compatible versions that should be ready soon. And finally, even if your favorite Mac program already appears on Apple’s A/UX-compatibility list, try to get a few second opinions about its compatibility by checking the UNIX and Mac forums on the larger on-line services.
EVERY YEAR, WE GIVE THE INDUSTRY A LESSON IN PRICE AND PERFORMANCE.

Class is now in session.

Introducing the $2299* BLP II.

Two years ago, they called our Business LaserPrinter® "The future of PostScript." Last year, they gave our PLP® II the MacUser Editors' Choice Award. But this time, we're really giving them something to study. Because now, we've done what was considered impossible. We've produced a printer that dramatically outperforms the Apple® LaserWriter® II, at half the cost: the $2299* Business Laser Printer II (BLP® II).

**Better At Any Price.**

Even if money were no object, the BLP II would still be the printer of choice. It has 2 megabytes of RAM, user expandable to 4, plus a high-speed processor so it can image your document almost twice as fast as the IINT. And unlike the competition, the BLP II's SCSI port boosts performance and provides access to unlimited on-line fonts. Want more? How about a small footprint and silent sleep mode. Edge-to-edge printing. User-friendly LCD front panel display, cost-saving toner recycling system, and our advanced QuickEnvelope™ software that makes printing envelopes a snap. Still not enough?

Because the BLP IIS gives you performance rivaling the IINTX at less than half the cost: an 8-page-per-minute printer for just $2799. Whether you choose the BLP II or the BLP IIS, you get compatibility not only with Macintosh, but with IBM® and compatibles, using PostScript or the optional LaserJet II emulation. And you get it fast.

**PostScript For Less.**

This is the printer you've always wanted, at a price you never thought you'd see. With true Adobe® PostScript and built-in AppleTalk®, you and everyone else on your Macintosh® network can immediately start producing the highest quality, 300 dots-per-inch (dpi) graphics and text using your favorite software. You even get the same 35 fonts as you get with the Apple LaserWriter. But now, the real lesson begins.

**The Fast Track: BLP IIS.**

Maybe you have a large network, with a heavy print load. A network you thought required the speed, power and price tag of a LaserWriter IINTX. Well, think again.

"Price reflects $100 factory-direct rebate when purchased from an authorized GCC dealer or directly from GCC through January 31, 1991. GCC-dealers are independent businesses and so such they may offer different prices, policies, and service arrangements. In Canada call 800-263-1405. © 1990 GCC Technologies, Inc.

Dealer or Direct: Your Choice.

Just call us toll-free. We'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery. And now, with our factory-direct rebate of $100 on both the BLP II and BLP IIS, your purchase is even smarter.

800-422-7777.

Gee-technologies
Peripherals With Vision.

Please circle 96 on reader service card.
computation takes place at a remote central mainframe or minicomputer). This is an attractive solution, but it leaves the individual X terminals at the mercy of the central systems and their maintenance schedules. Further, most users don’t need a mainframe’s tremendous computing power.

If you’re thinking about buying an X terminal (such as the DEC VT1000), you should think about getting a Mac II instead — once Apple has upgraded A/UX to support this new model (see the “On the Horizon” sidebar). Although some X terminals may cost $2,000 less than a Mac II, the Macintosh is a vastly more capable machine. It can not only provide the complete X Window interface but it can also run UNIX as well as Macintosh applications locally.

Who Else Needs It?
Before A/UX 2.0 shipped, a Macintosh telecommunications program and a modem (or network links) were always necessary in order to connect to a UNIX workstation or host mainframe. Now, if you are running A/UX, you can do a lot of UNIX work at a Macintosh on your desk. If you still want to dial out to a UNIX computer, you’re able to —

---

**A/UX 2.0**

Offering nearly flawless integration of the Mac interface and UNIX connectivity, this second release of A/UX is a reminder that Apple employs some of the world’s best programmers. Mac functionality is complete, and all the important UNIX tools have ported with a minimum of problems. Primary limitations are tied to CPU power, RAM, and hard-disk speed and how much of them you can afford.

**Pros:** Simultaneous highly efficient use of MultiFinder, Mac programs, and full UNIX power. Commando facility tames UNIX command language. Good product support. Access to Mac’s real-world productivity software.

**Cons:** Needs improvements to CommandShell, UNIX communication via serial ports, and default-RAM utilization. Inadequate tape-backup software and hardware (third-party options are necessary). Expensive if used solely for UNIX connectivity.

**Published by:** Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (800) 638-9895 or (408) 996-1010.

**List Prices:**

**Preconfigured A/UX CPUs** (include A/UX Accessory Kit and 30 days of Technical Answerline Service support; keyboard and monitor not included):
- Macintosh IIci CPU with 4 megabytes of RAM, 80-megabyte hard-disk drive with A/UX preinstalled, $4,269
- Macintosh IIlfx CPU with 4 megabytes of RAM, 80-megabyte hard-disk drive with A/UX preinstalled, $10,469

**Media** (include A/UX Accessory Kit and 30 days of Technical Answerline Service support; require 4 megabytes of RAM and Mac II with PMMU, SE/30, IIx, IIcx, IIci, or IIcx):
- External 80-megabyte hard-disk drive, SCSI cable, and terminator with A/UX preinstalled, $2,395
- Tape cartridge (QIC-100 format) with A/UX system software, $995
- Floppy disks with A/UX system software, $995
- CD-ROM disc with A/UX system software, $795

Apple also offers A/UX 2.0 upgrades on CD-ROM discs, floppies, and tape for owners of version 1.0. Call for details.

**A/UX manual sets**
- Manual set #B0274LUA, includes #M0429LL/A, #M0430LL/A, and #M0431LUA, $800
- User kit (#M0429LUA) for using A/UX with traditional UNIX commands, $275
- Programmer’s kit (#M0430LUA) for developing A/UX UNIX applications, $400
- Kit for system administrators (#M0431LUA), $75
- X Window System manuals (#M0748LUA), $195

**Licensing and Support:** Also available are right-to-copy and right-to-update licenses for A/UX 2.0, a right-to-copy and site license for the (A/UX) X Window System, one-year support contracts for the A/UX Technical Answerline Service, and an annual software-update service.

**Note:** Apple is planning changes in its price list and available configurations.
THE FIRST LASER PRINTER TO COMBINE HIGH STANDARDS AND LOW COST. THE $1299* PLP II.

Now you can have everything you ever wanted in a laser printer. Without paying the price.

Introducing the lowest priced laser printer in history: the $1299* PLP II from GCC Technologies. GCC developed the very first personal laser printer in 1987, and has over 20,000 satisfied users... more than everyone else combined.

Finally, a revolutionary printer at a revolutionary price. In fact, at $1299*, it's nothing short of a technological marvel.

Personal Desktop Printing.

Three years of research and development have put the finest printer technology right on your desktop: a combination of the newest third generation laser engine, GCC's own custom designed integrated circuits, and the market's most sophisticated QuickDraw™ imaging software yet.

Features such as a silent "sleep" mode, a very user-friendly LCD display and an envelope printing desk accessory have been carefully integrated. In the future, should your needs include PostScript®, there's even a user-installed upgrade.

The Highest Quality Printing.

Because PLP II includes 6 outline font families (for a total of 22 individual fonts), its razor-sharp, clean output can be shaped, scaled, and rotated to any point size—all at a full 300 dpi.

These outline fonts, combined with GCC’s powerful QuickDraw imaging software, give you unlimited flexibility in producing perfect documents from such applications as PageMaker®, Word®, Excel®, MacWrite®, MacDraw®, Persuasion® and Canvas®.

Even More Power: PLP IIS.

For those who demand even more power, there's also the PLP IIS.

With the PLP IIS, you get all the breakthrough technology of the PLP II, only now, you get it at a swift 8 pages per minute, making it the perfect solution for anyone printing a high volume of output.

You also get one megabyte of RAM, which can save you valuable time. For example, while PLP IIS is printing, your Macintosh can be processing the next page of your document.

And finally, with PLP IIS, you get a very powerful font library. In addition to the core set of 22 Bitstream® outline fonts, you also get a font package called Font Plus,” which means you'll have over 40 fonts to choose from.

Dealer or Direct: Your Choice.

GCC has made acquiring your new PLP II or IIS just as easy as using it.

Simply call us toll-free, and we'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery. And now, to celebrate our tenth anniversary, we'll even send you a factory-direct rebate of $100 on both printers.

800-422-7777.

We gladly accept MasterCard, Visa, American Express, or your company's corporate purchase order.

PLP II $1299*, PLP IIS $1799.°

*Price reflects $100 factory-direct rebate when purchased from an authorized GCC dealer directly from GCC through January 31, 1991. GCC dealers are independent businesses and as such they may offer different prices, policies, and service arrangements.

In Canada call 800 263-1405. © 1990 GCC Technologies, Inc.

Please circle 97 on reader service card.
most Macintosh telecommunications programs will work just fine with A/UX.

If you work with a Mac in an environment full of UNIX machines, you probably use a Mac program such as TCP/Connect II (from InterCon) to log in to those machines or transfer files over the Ethernet network. You may also have a UNIX-to-Mac mail system set up. But with A/UX, life becomes much simpler. Your Mac stays on the network, but now it’s a first-class UNIX citizen. You can use standard UNIX communications programs such as rlogin, TELNET, UNIX mail, or FTP (for file transfer) to talk to other UNIX machines. Better yet, you can read from and write to a networked UNIX machine’s hard disks directly with NFS. Those hard disks are then visible to MultiFinder and Mac programs, as with an AppleShare volume. You can even set up your Mac to allow other UNIX machines to access your Mac hard disk.

Product Support

Apple’s user support for the first version of A/UX was simply awful. Apple is now serious about A/UX, and every new purchase of A/UX 2.0 gets 30 days of unlimited toll-free, 5-days-a-week, 12-hours-a-day support from the A/UX Technical Answerline Service (which is now also much more helpful). Call it when all those A/UX manuals can’t help you.

Apple doesn’t provide direct support for third-party developers’ products, other than by publishing the regularly updated A/UX-compatibility list. Apple already has a few software patches to correct minor problems that have appeared since the original release of A/UX 2.0. Also available are a wealth of technical information and many public-domain programs, such as emacs.

As a result of Apple’s improved support, you’ll find that fewer Mac-application vendors give you dumb looks when you talk about A/UX compatibility.

The Grass Is Always Greener

Although A/UX 2.0 is a monumental advance in the Mac operating system, it’s not perfect. Along with better support for tape backup, we’d like to see some additional features. There are also a few minor bugs, but most won’t affect normal use.

The CommandShell program lacks refinements found in many terminal-emulation-software packages. It offers no support for the extended keyboard, it can’t archive sessions to disk, and it can’t compress empty lines after they scroll off the screen. It’s also not terribly smart about where it should create new windows.

The sendmail.cf file, which tells your Mac how to send mail to other machines via the serial port, is not configured to work correctly for UUCP (UNIX-to-UNIX Copy Protocol) remote connections. The UUCP software (a strange and unreliable old UNIX hack) is still seriously flawed.

Various A/UX default configurations could be improved; these affect security, shell run commands, and memory buffers. Apple should solicit a detailed, ongoing analysis of such default settings from its key A/UX sites.

The Mac supports a full 8-bit ASCII character set for filenames, whereas A/UX supports only 7-bit ASCII. This can cause real problems. For example, let’s say that you install a Mac INIT that contains ™ in its filename and then A/UX consistently bombs after log-in. If you attempt to delete the offending file by entering rm myfavoriteINITthatbombs™ in the UNIX Console dialog box, A/UX will interpret your keystroke combination Option-2 as an asterisk (*) instead of the ™ character.

A/UX doesn’t yet support multiple monitors hooked up to a single CPU. This is especially inconvenient when it insists on using the wrong monitor. In this case, you must rearrange the video cards so that the correct one is in the lowest-numbered NuBus slot.

It Looks and Feels Like a Mac!

A/UX 2.0 is, on the whole, a superb combination of the Mac and UNIX System V 2.2 and 4.3BSD extensions. Unlike other flavors of UNIX, A/UX is easy to set up and it makes common configuration tasks as simple as they can get.

For real-world work, A/UX is the best system to offer both UNIX and a large base of productivity applications. It’s an extraordinarily clean product, with few problems. In fact, A/UX is the most interesting and impressive software to have come out of Apple since HyperCard. A/UX 2.0 is not just great UNIX software — it’s great Macintosh software.

Alexis Rosen, owner of Arete Corp. In New York City, is a Mac consultant who has been working with UNIX for seven years. Jeff Pelttikau is associate director of MacUser Labs.

The Bottom Line

If you have no need or desire for UNIX, you can forget about A/UX — it doesn’t offer any major features not available in the Mac operating system and applications. On the other hand, if you have even a slight urge to run UNIX on a Mac (and you’ve got the hardware to support it), run out and buy A/UX today. For most users, it’s a wonderful, virtually painless way to run UNIX on your desktop without giving up your favorite Mac software.

Just because you’re buying A/UX, you don’t have to buy all-Apple hardware. Try a careful selection of third-party disk drives, memory, and Ethernet cards, and you may get more performance for your money. Keep an eye on Apple’s increasingly competitive pricing, though.

If you want UNIX connectivity but absolutely refuse to run UNIX on your local Mac, consider TCP/Connect II; it’s an elegant and powerful program. Or you might prefer MacX or eXodux. But then think about A/UX 2.0 again. It’s really that good.
Our sales team of Mac "know it alls." Another good reason to go CDA!

Over the last ten years CDA has worked hard to create something unique in the field of computer mail order—a company that could provide customers with the support they would expect from a local computer dealer, along with the convenience and economy of direct-order, by mail, fax or phone. Thus CDA has grown with the computer industry and, in the process, has earned a rock-solid reputation for providing superior-quality service and support.

The real key to our success is our people. CDA's expert sales staff is sensitive to customer needs and knowledgeable in Macintosh and its accompanying vertical markets. If you need assistance selecting a computer system, peripheral or software for your specific needs, we have the people who can help you. For follow up service and support, our technical support staff is here for you too — you'll never be abandoned with only a stack of manuals.

There are lots of good reasons to purchase your Macintosh equipment from CDA; but our people are the best reason of all.
Lease a Mac System for as little as $44.29/month*

Macintosh Ilci System
- Macintosh Ilci CPU w/Apple 40 Mb Hard Drive, Apple SuperDrive, 2 Mbs of RAM, & Microphone
- DataDesk Switchboard
- Magnavox 14" RGB Monitor
- HyperCard and MultiFinder
- Virex (anti-virus) Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- 10 Diskettes w/Storage Box
- Mouse Pad
Ask for Package #9107
CDA Price $5,969 or $142.41/month**
*Based on 5 year warranty
**Based on 60 month FMV lease

Macintosh Classic System
- Macintosh Classic CPU w/Microtech 50 Mb Hard Drive, Apple SuperDrive, Keyboard, Mouse, & 4 Mbs of RAM
- HyperCard and MultiFinder
- Virex (anti-virus) Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- 10 Diskettes w/Storage Box
- Mouse Pad
Ask for Package #9102
CDA Price $1,599
Only $44.29/month*
*Based on 48 month FMV lease

Scanners
- Abaton Scan 300/8S .................................. $1,479
- Logitech ScanMan 32 ................................. $379
- Thunderware ThunderScan ........................... $160
- Microtek MF 300GS w/SCSI ......................... $1,559

Microtek 300ZS Scanner
Now you can get a scanner that handles it all; 24-bit color, 256 shades of gray-scale, line art, even text — and get it all at an affordable price. The 300ZS comes with scanning/editing software, built-in SGL, plus a copy of ColorStudio & ImageStudio Software by Letraset.
All this for Only $1,899

The CDA Guarantee
30 Day Money Back
Every CDA product carries our own 30-day money back warranty. If you are not 100% satisfied with your purchase you may send it back for a hassle free refund or exchange (some items are subject to restocking fees).

One Year Performance
We guarantee everything we sell to be free of defects for one full year. CDA will repair or replace the item free of charge.

Improve the performance of your Ilci by as much as 40%.
The Micron Xceed Cache Card allows you to eliminate the 68030 wait-states by using 128K of direct mapped static RAM. Easily plugs into the Ilci cache connector. Comes with cache control software & 5 year warranty. .... $349

Scanners
- Abaton Scan 300/8S .................................. $1,479
- Logitech ScanMan 32 ................................. $379
- Thunderware ThunderScan ........................... $160
- Microtek MF 300GS w/SCSI ......................... $1,559

Microtek 300ZS Scanner
Now you can get a scanner that handles it all; 24-bit color, 256 shades of gray-scale, line art, even text — and get it all at an affordable price. The 300ZS comes with scanning/editing software, built-in SGL, plus a copy of ColorStudio & ImageStudio Software by Letraset.
All this for Only $1,899

The CDA Guarantee
30 Day Money Back
Every CDA product carries our own 30-day money back warranty. If you are not 100% satisfied with your purchase you may send it back for a hassle free refund or exchange (some items are subject to restocking fees).

One Year Performance
We guarantee everything we sell to be free of defects for one full year. CDA will repair or replace the item free of charge.

DoveFax Desktop
A Complete Communications Solution!
The DoveFax combines a 9600 baud fax modem and a 2400 baud Hayes compatible data modem into one compact unit (see system photo above). It performs true background operation allowing you to convert, send, and receive faxes while you continue working. And, the pre-scheduled transmission feature allows you to send faxes after hours when rates are lower. Ask about voice mail option.... $279

Modems
- Abaton Interfax 24/96 .................................. $399
- AE DataLink Express 2400 External ........... $169
- AE DataLink Express w/MNP-5 External ...... $199
- AE DataLink Mac 2400 Internal (Mac II) .... $199
- AE DataLink MacPortable w/Send Fax ....... $199
- Zoom 2400 Baud Internal (Mac II) ........... $129
- Prometheus 2400 Baud Internal (Mac II) .... $199

Speed up Your Mac!
- DayStar PowerCard 030 25 MHz (Il,Ix) ....... $1095
- DayStar PowerCard 030 25 MHz (Il,Ix) ....... $1,495
- DayStar PowerCard 030 40 MHz (Il,Ix) ....... $1,645
- DayStar PowerCard 030 40 MHz (Il,Ix) ....... $1,995
- DayStar PowerCard 030 50 MHz (Il,Ix) ....... $2,245
- DayStar PowerCard 030 50 MHz (Il,Ix) ....... $2,595
- SGI PowerCard 1Mb (expandable to 4Mb) $1549
- RAM PowerCard 8Mb (expand. to 64Mb) .... $895
- DayStar Fast Cache Ilci ......................... $279

All prices subject to change. Apple is a registered trademark of Apple Computer Inc. CDA is not an authorized Apple dealer. Product names are registered trademarks of their respective companies.
## Mass Microsystems DataPak

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-ROM w/ Microsoft Office Bundle</td>
<td>$1099</td>
</tr>
<tr>
<td>CD Technologies CD-ROM Drive</td>
<td>$649</td>
</tr>
<tr>
<td>DaynaFile Single 360K Drive</td>
<td>$499</td>
</tr>
<tr>
<td>DaynaFile Dual 360K/1.2Mb Drive</td>
<td>$719</td>
</tr>
<tr>
<td>CD-ROM w/ Microsoft Office Bundle</td>
<td>$1099</td>
</tr>
</tbody>
</table>

### Drives

- **Microtech Europa 20 Mb External** .......................... $399
- **Microtech Europa 40 Mb External** .......................... $499
- **Microtech Europa 80 Mb External** .......................... $619
- **Microtech Europa 100 Mb External** .......................... $759
- **Microtech Europa 50 Mb External** .......................... $599
- **Microtech Athena 100 Mb External** ......................... $899

*Quantum Internal w/logo & bracket* .......................... $449

40 Mb Internal 19ms w/5 yr warranty ......................... $449
80 Mb Internal 19ms w/5 yr warranty ......................... $639
105 Mb Internal 19ms w/5 yr warranty ......................... $699
170 Mb Internal 19ms w/5 yr warranty ......................... $999
IDS Wip 20 Mb External ........................................ $399
IDS Wip 40 Mb External ........................................ $479

### DataPak (SE footprint)

- **Microtech Europa 20 Mb External** .......................... $399
- **Microtech Europa 80 Mb Internal 19ms w/5 yr warranty** .......................... $639

**Microtech Athena 80 Mb Internal** .......................... $599

**Microtech Europa 100 Mb Internal** ......................... $799

**Microtech Europa 100 Mb External** ......................... $899

**Microtech Athena 50 Mb External** .......................... $599

**Microtech Athena 100 Mb External** ......................... $899

### Networking

- **Farallon PhoneNET StarController 300** ..................... $825
- **Farallon PhoneNET StarController EN** ...................... $1599
- **Farallon PhoneNET Connector (DIN-8)** ..................... $299
- **Farallon Timbuktu 5.1** ...................................... $95
- **Farallon Timbuktu/Remote 1.01** ............................. $125
- **Farallon Timbuktu/Remote Access Pack** ................... $845
- **Dayna Communications EtherPrint** .......................... $349
- **Asante MacCon+ IET** .......................................... $334
- **Asante MacCon+ SE/30ET** .................................... $334

### Input / Output Devices

- **DataDesk Mac 101 Plus** ....................................... $135
- **DataDesk Foreign Language Keyboard** ....................... $159
- **Mouse Systems Little Mouse** ................................ $75
- **Kensington Turbo Mouse ADB** ................................ $109
- **Alka REXA** .................................................... $119
- **Kurt Tablet (8 1/2" x 11")** ................................ $279
- **Wacom Graphics Tablet** ....................................... $385

### Monitor

- **The Rival 19" Monochrome Display by Mega Graphics**
  - MacWorld Magazine rated the Rival the top performing WYSIWYG big screen outranking dual-page displays costing much more.
  - Its darkened-glass screen effectively enhances contrast and reduces glare*
  - Rival 19" Monochrome w/video card ........................ $1199
  - Rival 19" Gray Scale (Mac II) w/video card ............ $1199
  - Rival 19" Gray Scale (SE/30) w/video card ............ $2199

### Monitors & Video Cards

- **Magnavox Mac Color 11" RGB** ................................ $659
- **Apple High Resolution 14" RGB** ............................... $799
- **E-Machines ColorT-16 w/video card** ....................... $2149
- **Radiator Pivot Display w/Interface Card** ................... $1415
- **Ikegami CT20 20" Trinitron w/6 bit card** ............... $2799
- **RasterOps SL 20" Trinitron w/6 bit card** ............... $4599
- **RasterOps SL 24" Trinitron w/24 bit card** ............... $5999
- **RasterOps ColorBoard 264 (Mac II)** ....................... $589
- **Micron 8-bit Video Card (Mac II, SE/30)** ............... $349
- **Apple Display Card 8.24** .................................... $719
- **Generation Systems Portable Publisher** ................... $449
- **Generation Systems Publisher SE Card** .................... $599
- **Generation Systems 24-bit Video Card** .................... $1999

### Printers

- **ImageWriter II w/cable** ....................................... $459
- **LaserWriter IINT w/cable and toner** ....................... $3395
- **LaserWriter IINTX w/cable and toner** .................... $4995
- **Personal LaserWriter NT w/cable** ......................... $2475
- **Kodak Diconix M150 w/ATM & cable** ....................... $529
- **QMS PS-810 w/cable & color** ................................ $2995
- **QMS PS-820 Turbo w/cable & color** ....................... $4965
- **QMS PS-410 w/cable & color** ................................ $2199

### Printer Accessories

- **The Organizer by CoStar** .................................... $189
- **The Organizer Jr. by CoStar** ................................ $69
- **LabelWriter by CoStar** ....................................... $185
- **Apple Laser Writer II Toner** ................................ $109

### Software

- **Macintosh Classic Upgrades**
  - 1 Megabyte Upgrade ........................................... $119
  - 3 Megabyte Upgrade ........................................... $189

### Software Orders over $100

*CAIA will ship your order free via Federal Express® Economy Two Day Service.

This applies to stock items under 15 lbs. and orders over $100 shipping within the contiguous United States. Alaska, Hawaii, Puerto Rico, Canada, and international orders, please call for rates.

Hours: Mon-Fri 9am-12pm; Saturday 9am-6pm
Customer Service: 800-526-5314 - 9am-5pm
Order via Fax: (908) 832-9740

1 CDA Plaza, Box 533, Califon, NJ 07830
Ad# 36-01
THE INVISIBLE BRIDGE TO MAINFRAME DATA

BY VERNON KEENAN, PAUL YI, AND THE MACUSER LABS STAFF

Your spreadsheet or database program can now help itself to data on your company's mainframe — MacUser Labs shows you how.

Imagine a database that holds all the data in the world. Such a mammoth store of information would require the most sophisticated hardware and software, tended by a protective swarm of MIS (management information system) professionals. But how would you use that database? If it were managed the same way most major databases are, you'd submit a formal request to the MIS department and then wait weeks for a report. Now imagine you could use your Mac to access this database yourself and transfer data directly into your spreadsheet, database, or HyperCard stack. All the data in the world would be just a mouse click away.

Such easy access to everything about everything is everyone's dream for the future. If your company's important data is currently held hostage in a carefully controlled central database, you'll already understand the attraction of quick, seamless personal access to crucial
information. What you may not know is that the technology needed to bridge the gap between Mac and mainframe has arrived. In fact, many corporations are already using the Mac to access industrial-strength database managers running on powerful servers. This next wave of network computing is called client/server computing.

In client/server computing, the server is the central computer that plays host to a network of Macs. This may sound similar to an AppleShare file server, which also sits on a network and can be accessed by all Macs on the network. But there is a radical difference between the two types of servers. A file server is a dedicated mass-storage device that all Macs on your network can access. It is just a place for storing data and has no intrinsic intelligence or functionality. The server in the client/server structure, on the other hand, is a host computer controlled by a database program. This type of server is called a data server (see the “Moving Up to Data Servers” sidebar). The data server maintains and updates the data and is able to follow complex instructions sent by client Macs.

The central computer can be anything from a powerful mainframe to a Mac, depending on the size and needs of the network. Corporations use mainframes from IBM, DEC, and other firms to handle heavy data demands. Running on these computers are heavy-duty database managers speaking SQL (Structured Query Language), the de facto standard language for database-management systems, which IBM developed in the late '70s.

MacUser Labs tested three software bridges that connect a Mac to a SQL data server; such bridges are known as APIs (application-programming interfaces). An API isn’t a database or spreadsheet program — in fact, it isn’t an application at all. It’s an invisible connection between your Mac application and the SQL database manager on the mainframe. When your Mac is hooked up through an API, you can control the mainframe database manager from a program such as HyperCard or ACIUS’ 4th Dimension. The API takes instructions from the Mac application and translates them into instructions that the database manager on the server can understand. The database manager on the server then carries out these instructions, and the API takes the resulting data back to your Mac. You never see the API itself; in fact, most users never even know it’s there.

The APIs we tested were Apple’s DAL (Data Access Language), Oracle’s SQL*Net, and TechGnosis’ SequeLink. We evaluated each for speed and ease of use and ease of setup. We constructed our own client/server network with several Macs and a DEC minicomputer and set out to determine which one was the fastest, simplest, and most robust API.

The Three APIs

All three APIs connect one or more Macs to an SQL data server, but each is unique in design and implementation. Oracle created SQL*Net specifically to connect its own SQL database managers to the Mac. Apple’s DAL and TechGnosis’ SequeLink, on the other hand, support a variety of SQL database managers (see Table I) from companies such as INGRES, Oracle, and Sybase. Although they all speak SQL, the database managers have their own idiosyncrasies and must be handled differently by the API.

The server in the Mac-API-mainframe link can be anything from a $1,000,000 IBM mainframe to a $10,000 UNIX workstation. (We have loosely called all these machines mainframes in this article.) But different computers have different operating-system software and communications protocols (AppleTalk, for example), and the API must follow each operating system’s rules. All three APIs work with DEC VAX minicomputers, and only SequeLink doesn’t support IBM mainframes. None of the three yet supports other popular mainframes — from Tandem, Unisys, or MIPS, for example. Oracle’s SQL*Net works on IBM’s slow-to-be-adopted OS/2 PC
Figure 2: Apple's DAL differs from Oracle's SQL*Net and TechGnosis' Sequelink in that its server end has two layers: one generic and one specific to the brand of database manager running on the server. The server-independent architecture frees MIS staffs from the chore of programming the Mac layers differently for each different server — an important feature when different servers share the same network.

**DAL**

- Mac application
- DAL for Mac
- DAL server
- DAL for brand A
- Brand A database manager

**SQL*Net**

- Mac application
- SQL*Net for Mac
- SQL*Net
- Oracle version 6 database manager

**SequeLink**

- Mac application
- Sequelink for Mac
- Sequelink
- Sequelink for brand A
- Brand A database manager
- Sequelink for brand B
- Brand B database manager
- Sequelink for brand C
- Brand C database manager
The three APIs reviewed in this article can connect your Mac to a mainframe database, but they can't help you do anything with the data you find there. You need a full-featured database or spreadsheet program to analyze, chart, or print your data. Programs from companies such as ACIUS and Microsoft take advantage of the server connection by supporting APIs. Also, a new crop of programs is appearing — ranging from simple query builders to full system-administration programs — that make using the SQL database server connection easier.

**ClearAccess Version 1.1**

This query tool provides a graphical interface for accessing SOL databases, with scripts that save and replay sequences of query actions. Supports DAL and SQL*Net.

- Fairfield Software
  - 200 W. Lowe
  - Fairfield, IA 52556
  - (515) 472-7077
  - $395; upgrades and unlimited tech support, $70; site licenses available

**Data Access**

Data Access is a macro that gives Microsoft Excel users direct access to SOL databases. Supports DAL.

- Data Access
  - Microsoft Corp.
  - 1 Microsoft Way
  - Redmond, WA 98052
  - (206) 882-8680
  - $15

**Data Prism**

Data Prism is a powerful, easy-to-use query tool that also has charting capabilities built in. Supports DAL and SQL*Net.

- Data Prism
  - Brio Technology
  - 810 Mountain Bay Plaza
  - Mountain View, CA 94041
  - (800) 486-2746
  - (415) 961-4110
  - $435; volume discounts available

**DataLink**

DataLink is a query tool that gives Wingz users direct access to SOL databases. Supports DAL.

- DataLink
  - Informix Software, Inc.
  - 16011 College Blvd.
  - Lenexa, KS 66219
  - (913) 590-7100
  - $19.95

**4th Dimension 2.10**

4D is a powerful relational-database program with a complete set of tools for accessing SOL databases. Supports DAL, SOL*Net, and SequeLink.

- 4th Dimension 2.10
  - ACIUS
  - 10351 Bubb Road
  - Cupertino, CA 95014
  - (408) 252-4444

**GeoQuery**

GeoQuery is a query builder that helps visualize data, especially data related to geography. Supports DAL.

- GeoQuery
  - Odesta Corp.
  - 4064 Commercial Avenue
  - Northbrook, IL 60062
  - (800) 334-6041
  - $395

**GQL**

In addition to being a query builder, GQL is a complete administrative system for SOL databases. Supports DAL and SQL*Net.

- GQL
  - Andyne Computing Ltd.
  - 544 Princess Street
  - Suite 202
  - Kingston, Ontario K7L 1C7
  - Canada
  - (800) 267-0665
  - GQL/Admin, $1,195
  - GQL/Design, $995
  - GQL/User, $395

**Hyper/DB Library**

Similar to Oracle’s SOL*Net, this is Sybase’s API for its own SOL database managers. (We invited Sybase to participate in this review, but the company refused to be involved in a comparison with Oracle’s database managers.)

- Hyper/DB Library
  - Sybase, Inc.
  - 6745 Christie Avenue
  - Emeryville, CA 94608
  - (800) 879-2273
  - $195

**Nexpert Object**

Nexpert Object is an expert-system shell that helps you reason about data from a wide range of databases and files. Supports DAL and SQL*Net.

- Nexpert Object
  - Neuron Data, Inc.
  - 444 High Street
  - Palo Alto, CA 94301
  - (415) 321-4648
  - Development system, $5,000

**Omnis 5.1.03**

Omnis 5 is a comprehensive Mac database manager that provides direct access to SOL databases. Supports DAL.

- Omnis 5.1.03
  - Lynda Users Software
  - 1065 E. Hillsdale Blvd., #300
  - Foster City, CA 94404
  - (800) 843-8615
  - (800) 223-8050 (in CA)
  - Single-user version, $1,000; each additional user, $99

**Tactician**

Tactician is a marketing-productivity tool with a geographic interface. Supports DAL.

- Tactician
  - Tactics International Ltd.
  - 16 Haworth Street
  - Andover, MA 01810
  - (508) 475-4475
  - $995 — $9,995, depending on configuration

Over the past year or so, you may have heard that Apple was planning to offer a mainframe-connection product called CL/1. It hasn’t disappeared — it’s been renamed DAL. The Mac layer will be part of System 7.0 and will be free with every new Mac. You’ll still need DAL’s Client Developer Toolkit ($695) to get the programming tools necessary to make the connection — and, of course, you’ll need to buy the mainframe layer.

DAL connects to most of the current crop of database managers running on DEC VAXes and IBM mainframes (see Table 1). The price of the DAL layer on the server is $5,000 to $20,000, depending on the mainframe. You can also expect DAL support for UNIX and A/UX sometime in the near future.

Oracle is one of the leading database-management-software companies, and it created SQL*Net to connect the Mac to its own database managers — and only its own operating system, and both SQL*Net and SequeLink are compatible with some implementations of UNIX.
Check the fax. You’ll choose a DataLink™.

Combine the raw power of your Macintosh with the utility of a modem and the indispensable convenience of a fax machine — and you’ve got a DataLink Send-Fax™ modem from Applied Engineering.

Send faxes directly from your Mac's screen without ever printing a "hard copy" of the information. The exclusive AE Send-Fax™ software installs itself in your Mac's Chooser DA. Faxes can then be sent as simply as printing. Imagine not having to waste time waiting around the fax machine to see if your faxes got through. Go right back to what you were doing, while AE Send-Fax™ operates in the background. You’ll automatically receive a report when the fax is completed.

Compile your own fax-number phonebook for instantaneous dialing. Customize your own cover sheet with your favorite clip art or drawing program. Preview your faxes by simply double-clicking their titles. Even program AE Send-Fax™ to send entire distribution lists from your phonebook.

Tell AE Send-Fax™ to send your faxes and lengthy distribution lists late at night, when phone rates are least expensive and you’re least likely to encounter busy signals. The next day, you’ll be presented with a report confirming your faxes were received.

You can even preset the number of retries for individual numbers, for distribution lists or for the entire phonebook.

Best of all, AE Send-Fax™ comes with the best modems you can buy — the DataLink™ series. 2400 bps modems that deliver unparalleled reliability, futuristic capabilities and unmatched technical excellence. Modems designed exclusively for the Macintosh, not "ported over" from another platform.

The result? Standard features like complete communications software included free, full Hayes AT compatibility, asynchronous data format, auto answer, non-volatile memory, automatic tone and pulse dialing, remote access, built-in diagnostics, FCC certified designs, free tech support, five year warranties and more. And upgradeability to MNP-5 with 4800 bps throughput speeds and error-free data transfer.

DataLink/Mac™ (top) for the Mac II series, includes an extra serial port so you can add a peripheral, even when the built-in ports are occupied. DataLink Express™ (left center) works externally with all Macintoshes and features another AE exclusive, our "Line Engaged" indicator to show a shared line is in use. Since DataLink Express works with all computers (w/ serial port), we included both mini-8 and DB-25 ports.

DataLink/Mac Portable™ (bottom) includes AE Send-Fax™ and MNP-5 as standard features and incorporates an ultra-low power design to extend the Mac Portable's battery life.

Order today! To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering MasterCard, VISA and COD. welcome. Texas residents add 8 1/2% sales tax. Add $10 outside U.S.A.

DataLink/Mac.......................................$299
DataLink/Mac with MNP-5.................. $349
DataLink Express......................................$299
DataLink Express with MNP-5..............$299
DataLink/Mac Portable......................$299
AE Send-Fax™ Option.........................$79

Applied Engineering®
The enhancement experts.
A Division of AE Research Corporation
(214) 241-6060
P.O. Box 5100
Carrollton, TX 75011
USA

Please circle 70 on reader service card.
All Macs are IICx’s equipped with 4 megabytes of RAM, a 40-megabyte disk, and Asante EN Adapters.

**Figure 3:** We set up this client/server network in our NetWorkShop to test the APIs. A DEC VAXstation 3100 was our server. Five Mac IICx’s were connected to the VAX with both LocalTalk and Ethernet. The API installation on the Mac was relatively easy, but the VAX installation was more trying — especially for Sequelink. Once it was running, however, the network gave us no trouble.

Mismatched database managers — running on a variety of computer platforms.

**The Layers of the Client/Server**

The Mac layer of each API is similar in form and function, but Apple’s DAL uses a server-independent architecture on the mainframe that frees your MIS staff from the chore of programming the Mac layers differently for each different server. DAL accomplishes this by adding an additional layer, a generic layer, to the server (see Figure 2). The generic layer doesn’t know the particulars of the computer or the database manager it’s running. The second mainframe layer, however, the specific layer, is exclusive to the brand of database manager and mainframe used. For a server running a Sybase database manager, for example, the generic layer runs on top of a Sybase-specific layer. For a server running INGRES, the same generic layer runs on top of an INGRES-specific layer.

The advantage of this architecture is that DAL’s Mac layer doesn’t need to know what SQL data server is being used. For networks with mixed database managers and servers, no extra work on the Mac end is required. If your DAL-equipped Mac can talk to one DAL server, it can talk to any DAL server.

Sequelink uses a single-layer server architecture, so you need a different version of Sequelink for each type of database manager or mainframe. And because the Mac layer of Sequelink must then talk to different versions of Sequelink on the server end, you also need to reprogram
Even though he's the biggest clown in the world, Bozo® doesn't fool around with his money. He plans and invests wisely, instead, using WealthBuilder™ by Money Magazine.

The acclaimed financial planning software that's turning people everywhere—even total clowns—into expert investors.

How do we do it? Simple. WealthBuilder explains in plain English what your financial options are. So you finally understand how to handle money. Equally important is how precisely WealthBuilder understands you. Enter your goals, assets, risk tolerance, and the system delivers unbiased recommendations on how to turn your financial dreams into reality.

Call 1 (800) 346-2024 for the $9.95 WealthBuilder preview package with demo software (or for your nearest Reality dealer). We're available on Macintosh or IBM systems. Or just turn the page. But remember, even a real Bozo couldn't pass on this offer.
Client/Server Computing

Figure 4: Each API supports HyperTalk as a programming environment, so we wrote a HyperCard stack to automatically test API performance. This stack is a good example of how you can create a custom interface to access the data server through a Mac application.

Moving Up to Data Servers

When you started your business, you had computing needs. You bought a few Macs, and — for a while — they more than filled the bill. But your business has grown over the years, and you’ve increased the number of Macs in the company and added a few AppleShare file servers. Now you’re realizing that you have to deal with a large amount of data and that the file servers are not fulfilling your needs. You need a powerful central database system. You need a client/server solution.

What’s Wrong with File Servers?

First of all, don’t let the prospect of wrestling with a mainframe or minicomputer scare you away from a client/server solution. Client/server technology is rapidly spreading to desktop computers that formerly were limited to file-server technology. Any networked Mac database system you have now, whether it’s an accounting system or a sales-lead-tracking application, is using file-server technology. You’re probably not happy with network performance, and if you are, you’ll be even happier with client/server performance.

Conventional file-server technology is very inefficient for large-database use, because the file server doesn’t know anything about the data. For example, say a database on the file server contains a list of names. When you ask your Mac database program to find everyone whose last name is Smith, the command your Mac sends to the server is something like “Give me the name of everyone in the database whose last name is Smiths.” If your database contains the names of 100,000 people, this moves an awful lot of data across the network — a slow process when only one user needs data and much slower on a heavily loaded network. Access time and performance also depend on the power of the machine on your desk, so you need expensive Mac models to optimize performance.

With client/server technology, you add a new computer to act as the data server on your network. In conjunction with an API, its database software is smart enough to answer specific requests, look up the data itself, and send back only the results. The command your Mac sends to a data server through an API looks like this: “Figure out which people are Smiths, and send just the Smiths back to me.”

Query Helpers

Although APIs solve the problem of Mac-to-mainframe connection, you still need a way to use the data you get from the server. Programs such as Microsoft Excel, HyperCard, and 4th Dimension are available with API links to help you analyze, sort, and chart this data. Such sophisticated front-end programs make the Mac a far more powerful tool than the “dumb” character-based terminals that were used before personal computers invaded the corporate world.

APIs also let you — or your ever-cooperative MIS department — program custom interfaces through their support of different languages, or programming environments. All the APIs support HyperTalk, HyperCard’s scripting language; SQL*Net and Sequelink support 4th Dimension (DAL will soon); and DAL and SQL*Net support various implementations of C and Pascal (see Table 1).

These environments let you set up sets of queries — commands such as Search, Delete, and Update — that are part of the SQL language. For example, you can write a HyperCard stack with buttons that can issue these queries or a custom 4D procedure that can seamlessly access a corporate database. You can even write entire programs for DAL that can not only query a database on the server but can also act as a database manager on the client Mac.

If programming isn’t your strong point, there’s good
difference in performance can be stunning. Note that most of the everyday actions you would perform on a database — add, change, and delete data — took less than two seconds in our data-server API tests, even with a very heavy load. The same tests run on a file-server database show response times in minutes.

The architecture of a data server provides several other benefits. Remote access over telephone lines, prohibitive time-consuming with a file-server database, is quite practical with a data server. It's no problem to mix PCs and Macs as clients, because the server doesn't care what kind of computer it's talking with. And you can get good performance with low-end Macs and LocalTalk networks, because the server is doing the heavy data crunching.

Just as a file server is a computer running file-server software, a data server is a computer running a database-management program along with the appropriate software layers to let Macs talk to it. In our tests, for example, the computer was a desktop VAXstation 3100; the database manager was Oracle, and the connection layers were the three APIs.

To give you the real benefit of data-server performance, the server must be running a truly multituser operating system, such as UNIX or VAX's VMS, on a machine such as a DEC VAX, a Sun workstation, or an 80386- or 80486-based computer. It's unfortunately not practical to use a conventional Mac as a high-volume data server, because neither System 6.x nor System 7.0 has the necessary memory-management or multituser features. But a Mac IIfx running A/UX — Apple's UNIX operating system — is a powerful UNIX computer on a par with Sun UNIX machines. The Oracle and Informix database managers (and a test version of Sequelink) already run under A/UX, and time will bring even more options.

Problems

Client/server computing will be the next wave of network computing, but there are some hurdles. The first is that client/server technology on the Mac needs to be easier to use — right now it's a job for MIS professionals, not average users.

We reviewed three APIs — DAL, Sequelink, and SOL*Net — which let you access data from a data server. But you — or your MIS department — first have to set up the API on both the Mac and the server. The APIs provide programming environments in which custom applications can be written, but developing an application with these products is no simple task. The programmer needs a good knowledge of SQL — the standard language for industrial-strength database programs — and HyperCard scripting, 4th Dimension-procedure writing, C, or Pascal. Other programs are available that can help you use APIs, but without easier user tools, client/server technology is a throwback to the old days when central MIS departments controlled all data and programming. If moving from file servers to data servers means you'll need a full-time and well-staffed MIS department, client/server computing is a set of problems masquerading as a solution.

By contrast, there are programs on the DOS side of the desktop-computer revolution that provide easy client/server solutions. Programs such as DataEase — similar to FileMaker and Double Helix on the Mac — manage server data, using the same functions as they use on local data. There's nothing as easy on the Mac — yet. With time and more user acceptance of client/server technology on the Mac, this situation will hopefully improve.

Who Needs a Minicomputer?

Computerizing a 40-user business five years ago would have required a $200,000 minicomputer. But today minis are becoming less expensive and easier to use. Client/server technology ideally merges the best of two worlds: all the ease of use of personal computers and the data-processing horsepower of a central minicomputer — or, for the truly power hungry, a miniframe. And the minicomputer can be a much smaller, cheaper machine than you would have needed five years ago, because all it does is crunch data while the Macs take care of handling the user interface. With client/server technology, businesses today are experiencing better database performance with 40 users on a $36,000 data server than they used to with $200,000 worth of minicomputers.

— David Beaver
on our VAX. To test the Mac end, we wrote a custom HyperCard stack that managed and ran all the tests and automatically recorded the results— a good example of a custom interface that can be created for APIs (see Figure 4). We also tested access over both Ethernet and LocalTalk to see if the higher throughput of Ethernet would improve download times.

We created tests that simulated actions users typically perform with a database: downloading a lot of data, finding a single record, updating a single record, and inserting a single record. We then programmed the HyperCard stack to pound the server by running the tests as fast as it could, one query after another. We launched the HyperCard test stack on an increasing number of Macs until all five IIcs were simultaneously pounding the server. Normal users wouldn’t be as rough on the server as our HyperCard test stack was, because humans would take a break between queries to read the data. We estimate that pounding the server with our test stack running on 5 Macs is roughly equivalent to the effect real users would have with 20 Macs.

Although the client/server setup with all three APIs improves performance over file-server levels, DAL is consistently the slowest (see Figure 5). When only a single Mac is accessing the server, the results are close, but adding even one more Mac to the server makes DAL’s performance degrade significantly. The more Macs accessing the data server and the more data being retrieved, the worse DAL’s performance became. With all five Macs trying to access the server to retrieve 400 records,
DAL took nearly 70 seconds to perform the query whereas SQL*Net took only about 20 seconds and SequeLink took 30 seconds.

Because of its two-layer architecture, which gives it server independence, DAL consumes more of the VAX's CPU resources than do the other two APIs. SequeLink and SQL*Net show similar times because they have similar architectures. Using DAL, the VAXstation 3100 was swamped by only three Macs simultaneously accessing the server. With SQL*Net and SequeLink, however, the VAX still had processing room to spare with all five Macs pounding away. If you use a faster computer or one with more memory as a server, performance should improve — but you're also more likely to have more users. Unless you do all your work on Sunday morning, expect to pace the room a bit if you use DAL.

DAL's two-layer architecture causes another major performance problem: DAL is slow making the connection to the server. Even for a single user, DAL took more than 30 seconds to make the connection to the VAX, compared with about 5 seconds for SQL*Net and 6 seconds for SequeLink. Taking such a long time simply to initiate a server connection and then taking even longer to transfer data could be a major hurdle in trying to gain user acceptance of DAL-based applications. Apple promises an upgraded DAL "real soon now" that will address its performance problems.

Besides DAL's unexpectedly slow performance, another test result that surprised us was that direct Ethernet connection did not substantially improve the speed of any of the APIs. Even when we thought we would see the greatest difference between Ethernet and LocalTalk performance — downloading a large amount of data to all five Macs via DAL — Ethernet showed only a 15-percent speed advantage over LocalTalk. There was no difference in download time when we had only a single user on the network, which was surprising because Ethernet can carry up to 40 times as much data as LocalTalk can. Unless you're downloading large color images from the server, you probably won't need the higher cost—at least $400 per Mac — of a faster physical network. The bottleneck is not the physical cables and protocols but the server and how efficiently the APIs use it.

Conclusions

All three APIs worked as advertised: We can confidently say that client/server technology is alive and well on the Mac. Although only a handful of applications presently take full advantage of API power, more should appear in the near future.

When choosing the right API for your network — or when advising your MIS department as it chooses — remember that SQL*Net and SequeLink have a similar architecture that provides similar performance. DAL, on the other hand, has a radical architecture that greatly impairs performance but that makes using and setting it up much easier when more than one server is installed on a network. DAL also provides powerful programming tools for writing custom interfaces. But the price of this platform independence and programming muscle is a severe performance penalty.

All three APIs come with a daunting collection of documentation. Oracle's SQL*Net (right) has clear installation instructions, while the documentation for TechGnosis' SequeLink is sketchy. Apple's DAL package wasn't ready in time for our photo.
What if you could have an electronic assistant, capable of typing 500 words per minute, while sitting quietly at your side, and taking up no more space than a telephone?

Sound like a great idea?

That idea is now reality with the Typist™ from Caere.® Designed to be the ultimate typing machine, the Typist is capable of reading any text, no matter what style font, font size or column format, and entering it directly into your Macintosh® or PC compatible word processor, spreadsheet or database — without interruption. Caere, the company that pioneered Page Recognition with OmniPage® has now developed the world’s most personal scanner.

The Typist works like your own personal assistant, capable of typing 500 words per minute — as well as numbers — entering it directly into your software application just like a keyboard — only faster.

The Typist is more than a typical hand scanner, generally suited to scan graphic images, but limited when it comes to text. As the world’s most personal scanner, the Typist is a sleek, ergonomically
Designed peripheral that requires no special training or expertise. Select text or columns of numbers from any document, and the Typist enters your selection directly into your word processor or spreadsheet in whatever format you happen to be using – fully simulating your keyboard in every way. Scan up to 2 column inches per second, and the Typist will stay fully aligned – even when you scan rows and columns sideways. Think of the possibilities.

Use the Typist as your very own personal assistant. Enter rows and columns of numbers from business journals or periodicals, directly into your most critical documents, including spreadsheets. Develop business reports, presentations, legal contracts, or desktop published documents in a fraction of the time. Further enhance your reports and presentations by incorporating graphics or photo images – the Typist makes it easy – improving your productivity whatever the assignment.

To learn more about the Typist and how it can be of assistance to you, contact one of Caere’s participating dealers. Caere, the Complete Recognition Company.

For more information:
Call: 1-800-535-SCAN
Write: Caere Corporation
100 Cooper Court
Los Gatos, CA 95030

Caere, OmniPage and the Caere logo are registered trademarks of Caere Corporation. Typist, AnyFont technology and The Ultimate Typing Machine are trademarks of Caere Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Printed in the USA. All rights reserved. ©1990 Caere Corporation.

Please circle 42 on reader service card.
# Table 1: Features of APIs

<table>
<thead>
<tr>
<th>Feature Category</th>
<th>Apple DAL (Data Access Language)</th>
<th>Oracle SQL*Net</th>
<th>TechGnosis Sequelink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prices for Mac</td>
<td>Free with System 7.0;</td>
<td>$399 per user; Oracle for Macintosh, $699 (database version)</td>
<td>$695 per user, with volume discounts</td>
</tr>
<tr>
<td>Prices for server</td>
<td>VAX/VMS Server, $5,000; IBM VM Server, $15,000; IBM MVS Server, $20,000</td>
<td>VAXstation, $620 - $1,950 VMS, $4,600 - $13,000, depending on number of users</td>
<td>$4,995</td>
</tr>
<tr>
<td>Server operating systems</td>
<td>IBM MVS and VM • VAX/VMS • Other</td>
<td>• UNIX, OS/2*</td>
<td>SCO UNIX/XENIX</td>
</tr>
<tr>
<td>Database-management systems</td>
<td>DB2 • INGRES • Oracle • Rdb/VMS • SQL/DS • Sybase • Other</td>
<td>• IBM MVS and VM, Informix</td>
<td>RMA</td>
</tr>
<tr>
<td>Networking protocols</td>
<td>3270 emulation • AppleTalk ADSP • Asynchronous • DECnet • MacRMA • Netway 1000/2000 • Other</td>
<td>• Avior MacMainframe*</td>
<td>TCP/IP</td>
</tr>
<tr>
<td>Client operating systems</td>
<td>Macintosh • MS-DOS • OS/2 • Other</td>
<td>• UNIX, IBM MVS and VM, VAX/VMS</td>
<td>Windows 3.0</td>
</tr>
<tr>
<td>Programming environments</td>
<td>HyperCard • 4th Dimension • Other</td>
<td>• Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (800) 282-2732</td>
<td>Oracle Corp. 500 Oracle Pkwy. Redwood Shores, CA 94065 (800) 345-3267</td>
</tr>
</tbody>
</table>

*SQL* Net works with any operating system that supports DECnet, TCP/IP, or 3270 emulation protocols.

†This was scheduled to ship in the fourth quarter of 1990.

‡Supported via SQL*Connect gateway

§You also need a LocalTalk/SNA gateway from the manufacturers of these protocols.

"4th Dimension support was supposed to be available in the third quarter of 1990.
HyperCard 2.0, the upgrade.

The ultimate Home improvement.

A particularly avid HyperCard® user once told us, “I’d pay a thousand bucks if you’d just let me create stacks with bigger cards— even more if I could combine type styles in a field, too.”

For him, and for you, Claris proudly announces the HyperCard 2.0 upgrade for $49.

For that, you’ll get what amounts to a HyperCard lover’s wish list come true: cards sizeable from one to 18 inches tall or wide; the ability to keep several stacks open at once; total font, style, and size flexibility within text fields; display of color and gray-scale graphics; new painting tools and visual effects; faster speed; and a more powerful array of reporting and printing options. That’s for starters.

You’ll also receive disks crammed with new, ready-made stacks, buttons and fields, stack templates, clip art, sample scripts, a script debugger, XCMDs and XFCNs, and easy-to-use tools for creating your own stack menus and user palettes. Plus a complete guide to HyperTalk® scripting.

And every HyperCard 2.0 upgrade comes with free technical phone support from Claris. As you can see, we’ve made a lot of changes in HyperCard. Now we can’t wait to see what you do with it.

Order your HyperCard 2.0 upgrade now. Use the attached form or call 1-800-628-2100 ext. 92.
BEST-BUY BARGAIN

WORD PROCESSORS

Saving money is always a good idea — especially when you can still get all the word power you need.

You don’t need a Rolls to drive to the laundromat. Such reasoning — and the Mac’s premium price — has convinced many would-be Mac owners to remain would-be Mac owners. Unable to justify a Mac for modest needs, they’ve settled for — what? — maybe a PC clone, maybe a Kaypro? But with the arrival of the new low-cost Macs, anyone can join the Apple family without mortgaging the family farm.

The new Mac Classic and LC are truly the computers the rest of us can afford. After you’ve plugged yours in, one of the first things you might want to do is use it to send a thank-you note to Cupertino. You’ll need word-processing software to write that note, though, and the price of the more powerful programs could bring the Rolls analogy to mind again. Who wants to buy a word processor that costs about half as much as a new low-cost Mac?
Dear MacUser,

I know there are lots of powerful word processors to choose from, but I'm looking for something easier to use and less expensive. How do MacWrite II, Microsoft Works, WordMaker, and WriteNow measure up?
Cost is not the only consideration. Sophisticated word-processing packages that provide some of the capabilities of traditional publishing systems — outlining, indexing, and table-of-contents generation, for example (see the "What You Won't Get in the Bargain" sidebar) — will make you climb a steep learning curve long after you've finished huffing and puffing over the high price tag. And a 1-or-2-megabyte Mac may not have enough power for the climb. Herein lies the mission of the bargain word processor: to provide the features you need to create less complex or shorter documents without the cost-and-complication overhead that comes with a higher-priced package.

MacUser Labs looked at four of the best bargain word processors on the market today: Claris MacWrite II, Microsoft Works 2.00, New Horizons WordMaker 1.01, and T/Maker WriteNow 2.2. Three of these are dedicated word processors, but Microsoft Works is an integrated package of programs with many other features (see the "Bundled Bargains" sidebar). Rather than being dismissed as entry-level or categorized as low-end, these word processors should instead be thought of simply as low-cost. For many users, they offer as many features as they will ever need. If you don't need complex page-layout or document-organizing capabilities, don't pay for them (see the "Shareware Word Processors" sidebar).

In evaluating any word processor, you need to look beyond the results of benchmark tests. The way a word processor looks and feels, how well your hardware can handle it, and whether it can do what you want it to are probably going to be more important to you than anything else.

**Bargain-Basement Word Processing**

At its simplest, word processing on the Mac involves two steps: editing (getting the right words in the right order) and formatting (giving the document the look you want it to have when it is printed). A good word processor lets you edit with speed and efficiency and format with power and flexibility. It doesn't just have a lot of features — it has useful features that work well.

Whether you're writing a 1-page memo or a 100-page proposal, some features are essential in a word processor (see Figure 1). For example, you need the ability to assemble and reassemble your document at will, search for and replace text, and globally change font characteristics. And all these features have to work swiftly and consistently. Before we evaluated each word processor's editing and formatting power, we examined how well the program handled the most essential feature of all: the ability to let you change your mind.

**Undo.** Did you just delete an entire paragraph by mistake? The Undo command can, for the most part, put it right back in. We say "for the most part" because each of these programs has different levels of undo-ability. WriteNow can undo virtually anything you've done, even a global search and replace — an invaluable feature when you've just made a disastrous global error — but something MacWrite II and WordMaker can't. WriteNow's Undo command can also

---

**What You Won't Get in the Bargain**

What if you're Writing the Great American Novel? Or — even more of a challenge — the Great American Quarterly Sales Report and Earnings Forecast? Although the four word processors we tested pack a lot of punch, you might want some features found in higher-priced packages — outlining, complete style-sheet support, and automatic indexing and table-of-contents generation, for example. The most popular Macintosh word processor is Microsoft Word — by a long shot. Don't think, however, that Microsoft has a lock on the features market: Vendors such as Ashton-Tate and Paragon Concepts are snapping at Microsoft's heels with FullWrite Professional and Nisus, respectively.

Outlining is a habit that many people have had foisted on them by strict high school English teachers. You can create an outline in any word processor, but reorganizing an outline is tedious without software support. High-end word processors all have outlining capabilities that make this reorganization easy. For example, when you move a top-level heading, all the subordinate headings — and their accompanying text — automatically move with it. You can instruct the word processor to show just high-level headings so that you can see "the big picture" and then home in on particular areas by showing the lower-level headings within.

Another important feature you'll want if you typically write longer documents is a style sheet. A style sheet is a description of the formatting you want to use for the many parts of your document. For instance, you can specify one format (Helvetica 12, justified) for regular paragraphs, a different one (Palatino 24, bold, centered) for chapter titles, and so on. If you later change your mind about what kind of formatting you want, you need change only the style in the style sheet: The program automatically changes the formatting for every paragraph that uses that style. Imagine how much time this approach can save on a book-length manuscript, and you can see how style sheets are an absolute must for people working overused) features is the ability to wrap text around a graphic. A related but more useful feature is the ability to place a block of text anywhere on a page. This feature allows you to make pull quotes — text that appears in larger boldface letters to draw the reader into the document. In general, the higher the cost of the word processor, the more choices for page layout it offers.

— Paul Hoffman
Figure 1: Minimum Features

Figure 1: Even for a short memo or letter, you may want to use these features: search and replace, character formatting, paragraph formatting, spell checking, and placing graphics from the Clipboard.

A spelling checker can catch this typo. You can add names to dictionaries too, to customize the spelling checker for your particular business or interest.

Search and replace lets you quickly and consistently change a product name throughout your document.

Paragraph formatting refers to the indents, line spacing, and tab settings that you set up in your document. You can apply different formats to different paragraphs.

You can place your company logo, in PICT format, from the Clipboard as a graphic.

You can undo your last command even after you’ve deselected the text or moved the cursor.

After determining how readily each word processor would let us get out of editing and formatting jams that our explorations might lead us into, we looked at capabilities common to all four word processors: formatting paragraphs and characters, finding and changing text and other items, creating headers and footers, designing stationery documents, and using spelling checkers.

**Formatting paragraphs.** To format a paragraph in any of these word processors, you use an on-screen ruler to set left and right margins, indents, tabs, and to align text and set line spacing. For precision formatting, MacWrite II also lets you enter all setup features in a dialog box.

WordMaker lets you set the ruler in units of inches; centimeters; picas; points; or if you really miss your typewriter, 10-pitch. MacWrite II provides inches, decimal inches, picas, points, millimeters, and centimeters. WriteNow gives you the option of inches or centimeters, and Works constrains you to inches alone. All four programs let you copy formats from one paragraph to another. WriteNow goes one better and lets you change similarly formatted paragraphs with just a few keystrokes.

If you select multiple paragraphs and then hold down the Shift key when making a ruler change, you change only those paragraphs whose settings are identical to those of the first selected paragraph. So if you had indented all your long quotes half an inch from the left margin but later decided to indent them from the right margin as well and if no other paragraphs except long quotes had the half-inch indent, then you would be able to quickly change all the quotes simultaneously.

**Character formatting.** The standard complement of Mac text styles includes plain, bold, italic, underline, shadow, superscript, and subscript.
Word Processing

The beauty of the Macintosh is that you can see these fonts and styles on-screen in WYSIWYG fashion. You can boldface the heading of the first major section of a report and then change it from the 12-point Palatino you are using for the main body of the text to 18-point Helvetica. WriteNow allows you to extend or compress the space between characters. With MacWrite II, you can select word underline, double underline, or strikethrough text. This last ability is of special interest to those in the legal profession.

Finding and changing. Say you have a lengthy business proposal and want to see all the places you’ve used the term low-cost; you can use Find to do so. If you want to change all the instances of low-cost to competitively priced, you can use the Change (or Replace) feature. But what if you want to search for or replace something other than text — for example, replace one paragraph with two tabs or replace one paragraph return with two? Works lets you search for and replace only tabs and paragraph symbols (see Figure 2); WordMaker doesn’t let you do even these.

MacWrite II — in addition to letting you search for paragraphs and tabs — gives you a list of more than a dozen codes you can use to search for such items as page breaks, column breaks, graphics, and footnotes. It also lets you find and change character formatting. Selecting Use Attributes in the Find/Change dialog

Figure 2: Microsoft Works lets you search for and replace tabs and paragraph symbols. Clicking on the upper arrow or the paragraph symbol instructs Works to place that element in either the Find What or the Replace With box.

Figure 3: In addition to letting you search for and replace more than a dozen non-display items, Claris MacWrite II provides an extended Find/Change dialog box that lets you search for and replace text attributes. For example, you can easily change all 16-point Helvetica bold italic to 10-point Times plain.

Shareware Word Processors

There are three reasons for checking out shareware instead of shrink-wrapped word processors. First, you may not need the power of a commercial package. Second, shareware is usually much, much cheaper than any package you can buy. Third, you can try out shareware before you write a check to the author. And by all means, if you’re using a shareware program, write that check. No one gets rich from shareware; programmers do it for the love of the work and for the hope of small reward. In addition to sending a check, it’s a good idea to note any bugs you find — shareware authors don’t have the testing and research facilities of a Microsoft or an Ashton-Tate. If you find a bug, tell the author. Odds are you can get it fixed.

Shareware is available from user groups, on-line services and bulletin boards, and some dealers. Two of the best shareware libraries are kept by BMUG (Berkeley Macintosh Users Group) [415] 549-2864) and BCS (Boston Computer Society, [617] 825-0165). Of course, our favorite on-line service is our own Zmac.

McSink 6.5 and 7.0 ($51.50 including documentation): Dave McWherter’s fine DA word processor has metamorphosed into the commercial Vantage, but the shareware versions work just fine. Both versions listed are still commonly available, but you may want the earlier version, because word wrap was removed from version 7.0. Why? So the later version wouldn’t compete with Vantage.

ConText 1.1 ($3): A new entrant into the world of shareware word processors. Although its features are more limited than MsCink’s, it does all the basics, such as word wrap and printing, handily. It’s compatible with Adobe Type Reunion and supports all font sizes. ConText can also strip or insert carriage returns — a feature of special interest to frequent telecommunicators. And when you’re talking about 8 bucks, who can complain?

JoliWrite 2.0 ($20; additional $5 for the next version): Benoit Widermann’s offering is not as powerful a DA as McSink, but it does have a ruler, case conversion, full font support, auto-save, and search and replace. One idiosyncratic feature is the location of its menu, which you activate by clicking on the program’s name in the upper left corner of the window.

MyWord 0.52 (free): This freeware from Elipsoft Software can open or save only files smaller than 32K — about 16 pages — but if you write documents longer than that, you’ll probably also need the features of a commercial program. MyWord features a ruler and word wrap and supports all type styles, although in a limited number of sizes. Notable are automatic word count and pop-up icons along the bottom of the screen.

miniWRITER 1.8 ($12): This popular program, by Acta author David Dunham, is a classic of the shareware field. It has no ruler, so text wraps to the size of the window, but you can tell the program to insert a hard Return every so many characters. miniWRITER can also turn normal quotes and apostrophes into smart ones and vice versa. Nothing flashy, just a workhorse.

Notepad++ 1.0 (free): Unlike the other shareware word processors, Notepad ++ is not so much a word processor — although it’s entirely capable as one — as a complex replacement for the Notepad DA included with your Mac. Written by Alexander S. Colwell, Notepad++ can hold up to eight pages of 32K each, and it lets you create as many files as you like. It has a ruler and supports different fonts, styles, colors, and paragraph alignments.

— Daniel J. Rosenbaum
box displays an expanded Find/Change dialog box that lets you search for and replace font, size, and style (see Figure 3).

Although WriteNow's list of codes is much shorter than MacWrite II's, WriteNow lets you use a wildcard character — typing a question mark in the Find/Replace dialog box lets you search for any single character, number, or time or date marker. When you tell WriteNow to search for cat?, for example, it stops at can, car, and cat. As we discovered in our tests (discussed later), how quickly each application could accomplish a search varied greatly.

**Headers and footers.** Headers and footers are text — and sometimes graphics — that is repeated at the top and bottom of each page of a document. You can use headers and footers for repeating a report title or for putting page numbers onto the same place on every page, for example. WriteNow lets you have as many different headers and footers as you like, so you can have more than one chapter or section header or footer within the same document (see Figure 4). With MacWrite II and WordMaker, you can have a different header and footer for right and left pages only.

MacWrite II and WriteNow both let you include graphics within the header or footer. WordMaker doesn't let you put graphics into your header or footer, but just as with WriteNow and MacWrite II, you can insert the Date, Time, or Page command to have the program update these items automatically.

Works is more limited in its use of headers and footers than any of the other three programs. It uses the Page Setup dialog box, much as Excel does, to let you enter text for a header or a footer. You have to enter formatting codes in the boxes if you want to center text; format the style of text; or make the text align to the left, center, or right. For example, the codes &d and &t tell Works to print the current date and time in your header or footer and &I makes it print the characters that follow in italic (see Figure 5).

Although this coding method is not as easy as setting up headers and footers in any of the other programs, the documentation is well organized and accessible. You won't see your header and footer within your document, but you can preview the result of all your coding by selecting Print Preview from the Print dialog box. Nonetheless, it's still the least flexible of the four for headers and footers and not at all elegant.

**Stationery.** After you've gone through the trouble of formatting a proposal, you can save it as a template, or "stationery," document. All four programs let you save a document as stationery. When you open a stationery document, you are really opening a copy of the original. You can modify whatever text you need to and then save it under a new name without altering the original. Your stationery file remains unchanged, and you have a similarly formatted and edited document with a different name.

MacWrite II, WordMaker, and Works let you save a stationery file type, which means you can have as many stationery documents as you might need. In WriteNow, the stationery-document system is really a method for saving default settings; each time you select New from the File menu, the stationery settings appear in your Untitled document window. To create a stationery document, you must name the chosen document Stationery and place it in the same folder as your WriteNow application — thus, you can have only one stationery document at a time.

**Spelling checkers.** Regardless of the length of your document and your command of Webster's Ninth New Collegiate Dictionary, it's always a good idea to spell-check before you print.

WriteNow provides the largest
### Word Processing

**Options:**
- **Must capitalize after period**
- **Proper noun capitalization**
- **Mix numbers and letters**
- **Double word errors**
- **Two spaces after period**
- **Homonyns**
- **Treat hyphens as spaces**

**Figure 6:** You can set Microsoft Works’ spelling options to provide a more intelligent spelling check. Its ability to spot double-word errors (the the) is particularly useful.

---

MacWrite II and WordMaker also have an optional continuous spelling checker: The Mac beeps and the menu bar flashes if you misspell something as you’re typing — either a welcome feature or a bit annoying.

Works’ spelling checker is strictly a “modal” feature. You must open the spelling checker, use it, and then close it before you can go back to editing your document. You can customize it via the Options setting to find repeat instances of a word (see Figure 6); to check for capitalization after a period; and to stop at homonyms — *their, there, and they’re*, for example.

**Fast Words**

Although speed is not the most important factor in choosing a word processor, poor performance can turn an otherwise innocuous task — such as searching for a word in a long document — into a source of stress and frustration. To see how the four bargain word processors placed, we brought out our digital stopwatch and launched each program on a 1-megabyte SE. (The Classic and LC had not been released at test time.) We then imported four different file types and timed performance in a variety of editing and formatting tasks.

**Importing and exporting files.** Our four test files consisted of an ASCII text file, a Word 3.0 file, a MacWrite 4.5 file, and a MacWrite 4.5 file with graphics. The results for importing the ASCII text file and the MacWrite 4.5 file with graphics are shown in Figure 7. WriteNow and WordMaker were the text-import champs, with MacWrite II taking nearly twice as long and Works lumbering far behind. Only MacWrite II and WriteNow were able to import the Word 3.0 file. Both programs also ready when you need it.

MacWrite II and WordMaker also have an optional continuous spelling checker: The Mac beeps and the menu bar flashes if you misspell something as you’re typing — either a welcome feature or a bit annoying.

**Works’ spelling checker is strictly a “modal” feature.** You must open the spelling checker, use it, and then close it before you can go back to editing your document. You can customize it via the Options setting to find repeat instances of a word (see Figure 6); to check for capitalization after a period; and to stop at homonyms — *their, there, and they’re*, for example.

---

**Bundled Bargains**

If you’re on a three-week survival course in the Rocky Mountains, you may want a Bowie knife and a complete set of climbing and camping tools. But if you’re spending one night in a sleeping bag in the Berkshires before driving home from a Tanglewood summer concert, a Swiss army knife may do just fine. The Swiss army knife of Mac software has long been Microsoft Works. This single package provides entry into a broad range of computing activities by combining word-processing, spreadsheet, database, and communications programs. At $295, it’s about $100 cheaper than Microsoft’s stand-alone word processor, Word 4.0, and you can easily find it discounted to prices less than $200.

Works stands out in ease of use for word-processing tasks that require help from its other modules. For example, it’s easy to incorporate a chart from the spreadsheet program into a Works word-processing document. Mail-merge is conducted hand in hand with the database program, with the database program doing most of the work. Unfortunately, when used by its lonesome, the word-processing module is uninspired. Editing control is limited, and complex formatting is simply out of its range.

T/Maker overcomes some of the shortcomings of Microsoft Works with its new SmartBundle ($349). Rather than using the Swiss-army-knife approach, T/Maker provides a complete set of camping tools by bundling WriteNow 2.2 (a word processor), SuperPaint 2.0 (a painting and drawing program), RecordHolderPlus 3.1 (a database program), and Full Impact 1.1 (a spreadsheet program). What’s more, all are tied together with SmartBundle Launch, a customized version of CE Software’s DT Launch, to allow easy access to each application even without the use of MultiFinder.
Figure 7: Speed Tests

We ran our suite of benchmarks on an SE, using documents that were similar to common business reports and that included a variety of text and graphic elements, headers and footers, and bulleted lists. As a point of comparison, we also ran the same tests with the best-selling Mac word processor, Microsoft Word 4.0.

Word 4.0
Word 2.2
WordMaker 1.01
MacWrite II
Works 2.00

Launch application
Import text document
Import MacWrite 4.5

Better
Worse

0 50 100 150 200 250 300 350

Search for last word
Search and replace
Undo search and replace

Word 4.0
Word 2.2
WordMaker 1.01
MacWrite II
Works 2.00

Global font and size change
Undo size change

Better
Worse

0 20 40 60 80 100 120 140 160 180

We clocked the time it took each word processor to find the last word in the document. WriteNow performed faster than the other programs and took even less time to undo the search and replace. WriteNow’s Undo feature is the most extensive, letting you undo even after moving the cursor.

Global font and size changes often occur in the background during a word-processing session. To avoid giving unfair advantage to word processors that have background repagination features, we timed the global font and size changes to include repagination of the 25-page document.

Word 4.0
Word 2.2
WordMaker 1.01
MacWrite II
Works 2.00

Global font change
Global size change
Undo size change

Figure 7: Speed Tests

We ran our suite of benchmarks on an SE, using documents that were similar to common business reports and that included a variety of text and graphic elements, headers and footers, and bulleted lists. As a point of comparison, we also ran the same tests with the best-selling Mac word processor, Microsoft Word 4.0.

Word 4.0
Word 2.2
WordMaker 1.01
MacWrite II
Works 2.00

Launch application
Import text document
Import MacWrite 4.5

Better
Worse

0 50 100 150 200 250 300 350

Search for last word
Search and replace
Undo search and replace

Global font and size change
Undo size change

Better
Worse

0 20 40 60 80 100 120 140 160 180

We clocked the time it took each word processor to find the last word in the document. WriteNow performed faster than the other programs and took even less time to undo the search and replace. WriteNow’s Undo feature is the most extensive, letting you undo even after moving the cursor.

Global font and size changes often occur in the background during a word-processing session. To avoid giving unfair advantage to word processors that have background repagination features, we timed the global font and size changes to include repagination of the 25-page document.

We clocked the time it took each word processor to find the last word in the document. WriteNow performed faster than the other programs and took even less time to undo the search and replace. WriteNow’s Undo feature is the most extensive, letting you undo even after moving the cursor.

Global font and size changes often occur in the background during a word-processing session. To avoid giving unfair advantage to word processors that have background repagination features, we timed the global font and size changes to include repagination of the 25-page document.
deferred repagination takes place. The difference between repaginating a page at a time and repaginating an entire document can be dramatic. MacWrite II, for example, updated the screen after a global change in a little more than four seconds. But when we scrolled through the document, the constant repagination added to MacWrite II’s total time, so it ended up taking longer than WordMaker and WriteNow. Poor Microsoft Works again finished last (see Figure 7).

With minor variations in flexibility and more-pronounced differences in speed, all four of the applications we tested are able to handle basic word-processing tasks. This is to be expected — without the ability to move text blocks around at will, search for text, and replace one word with whatever you want, you might as well stick with a typewriter.

More Features in the Bargain

If and when your needs go beyond writing simple memos, letters, or short reports, you’ll need other features that a bargain word processor may or may not give you. A consultant, for example, might want to prepare a proposal with a report title on each page, the opinions of experts in footnotes, and impressive graphs in an appendix.

Footnotes and endnotes. The ability to make footnotes is a must for any kind of academic or legal word processing, but you won’t get any more help from WordMaker and Works than you did from your typewriter. Both WriteNow and MacWrite II, on the other hand, let you enter footnotes easily and then forget about them. If you delete a footnote, the numbers for all the others automatically change accordingly. WriteNow alone lets you put pictures into footnotes, and you can have footnotes of any length. You can also insert the page number, time, or date automatically from a menu selection.

WriteNow keeps footnotes in a separate window, which makes it easy to edit and format them all at once (see Figure 8). When you’re at the point in your text where you want a footnote, choose Insert New Footnote and the Footnote window pops up. After you have finished typing the footnote text, clicking on the Page View icon in the bottom corner of your screen returns you to your place in the main text.

MacWrite II doesn’t keep footnotes in a separate window, but it does let you select whether footnotes should appear at the bottom of the appropriate page or at the end of the document. WriteNow doesn’t let you make endnotes. In either program, you can choose a starting number for automatic numbering of footnotes, but only MacWrite II lets you mark footnotes with characters (up to nine of them) rather than numbers.

Styles and style sheets. A style is a formatting element that holds formatting characteristics in one place so that you can apply them again and again to selected text. A style sheet contains all the styles related to a single document. If you create long documents with a variety of text types — a report with several levels of headings or subheadings, for example — you will want a word processor that lets you format similar text items quickly. Who wouldn’t want to format one heading or one quote and then, with a single command, apply either of those formats to all subsequent headings and quotes? WriteNow and MacWrite II have

The data file contains rows of names, addresses, and other information (fields) that will be merged with the form; for example, template, letter. Each row makes up a record. The top row in the file contains the names of the fields. This file is usually a plain-text file, and it can be extracted from a database.
adopted various methods of speeding up character formatting along the lines of this style-sheet system.

With WriteNow you can copy character formats by clicking on the text that already has the font, size, and style you want to copy and then choosing Copy Font/Size/Style from the Edit menu. Next, you select the text to which you want to copy this character formatting, and choose Paste Font/Size/Style from the Edit menu. You can quickly change all text that shares character formatting to a new character format by holding down the Shift key while choosing Paste Font/Size/Style. Even if you select the entire document, only the text with the same font, size, and style will be changed. This feature lets you, for example, change all underlined Helvetica text to boldface Palatino in one quick step.

MacWrite II takes a slightly different tack by providing a Custom Style dialog box (see Figure 9). You can create up to 30 custom styles — specifying the font, size, and type style — and add them to the Style menu. Then you can use a single command to change all the style attributes of the text you select, or you can begin typing in a custom style any time you like. This is something WriteNow doesn’t offer. MacWrite II does not, however, provide any equivalent of WriteNow’s option for

Figure 9: Claris MacWrite II lets you add up to 30 custom styles to the Style menu by entering your specifications in the Custom Style dialog box.

The form letter (template) contains the field names, surrounded by delimiters (¬ and »). When you activate the Mail Merge command, the program generates a single letter for each record in the data file.
quickly changing all identically formatted paragraphs to a new format. So overall, MacWrite II and WriteNow match up pretty evenly in their attempts to offer fast formatting, although WriteNow’s method has more global power.

Columns. Remember setting up columns on your typewriter? You set tab stops wherever the columns were supposed to be and then typed and tabbed. This worked fine for things such as balance sheets and income and expense statements. But if you want to create something along the lines of a newsletter with justified columns of text running up and down, this method isn’t going to work very well. What you want is snaking columns—text automatically filling the page from top to bottom and then from column to column across the page. WordMaker and Works can do the first type of column—with tabs—but they can’t produce snaking columns.

With MacWrite II, you can have up to ten columns, snaking or tabbed. WriteNow lets you select up to four of either type of column in the PageCapsule Reviews

**Claris MacWrite II**

MacWrite II is powerful yet easy to use. You can create custom styles and add them to your menu for faster character formatting. It supports translation for more than 30 Mac- and PC-compatible applications.  
**Pros:** Powerful search-and-replace function. Easy, menu-driven mail-merge.  
**Cons:** Can have only one header and footer for each document.  
**Published by:** Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052; (408) 987-7000.  
**List Price:** $249.

**Microsoft Works 2.00**

Microsoft Works has been the integrated package of choice for years. In addition to the word processor, you get spreadsheet, database, and telecommunications modules. The package is an excellent value, but the word-processing module is slow and inelegantly featured. Although the overall package gets a four-and-a-half-mice rating, the word-processing module rates three mice.  
**Pros:** Can customize the spelling checker. Quite easy to learn and use.  
**Cons:** Slowest. Clumsy footer and header creation.  
**Published by:** Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717; (206) 454-2030.  
**List Price:** $295.

**New Horizons WordMaker 1.01**

No fuss, no muss. A simple, easy-to-use word processor that doesn’t pretend to be anything more than it is. It comes with an excellent manual, weighing in at less than 100 pages and completely accessible.  
**Pros:** Least expensive. Very fast. Can sort paragraphs. Better graphics handling than you’d expect from a low-cost word processor.  
**Cons:** Limited feature set and importing capability. Cannot do footnotes.  
**Published by:** New Horizons Software, Inc., P.O. Box 43167, Austin, TX 78745; (512) 328-6650.  
**List Price:** $124.95.

**T/Maker WriteNow 2.2**

A brisk-running, reasonably priced package that comes bundled with Grammatik Mac 2.0, a 1.4-million-word thesaurus, and templates for Avery mailing labels. A great value for the money and easy to learn and use.  
**Pros:** Multiple headers and footers per document. Separate footnote window for editing and formatting ease.  
**Cons:** Cannot set top and bottom margins. Can’t do endnotes. Multiple columns limited to four.  
**Published by:** T/Maker Co., 1390 Villa Street, Mountain View, CA 94041; (415) 962-0195.  
**List Price:** $199.

166 January 1991 MacUser
FOR DESIGN, SPEED AND PRICE, EVERYTHING POINTS TO MacTRAC.

MacTRAC fits beside your keyboard in less than 4 inches. And, unlike a mouse, it stays put in one spot. MacTRAC gives you back the desk space your mouse and mouse pad took away from you. Now, no mouse pad, no mouse rowing, no mouse cleaning.

Click with your thumb or fingertips on MacTRAC's wrap-around buttons. They're easy to locate and unexcelled on response, with built-in drag lock. No more holding down a button while you drag the cursor.

MacTRAC is the most comfortable pointing device you'll ever lay a hand on. The innovative, low profile ergonomic design gives you more pointing muscle while reducing wrist strain and tension. If mice ever made you feel like you're all thumbs, wait till you try MacTRAC.

Just plug MacTRAC in and perform. It's that simple. The ADB version works with Mac SE*, Mac II and Apple IIGS*. The DB9 version works with Mac, MacPlus, Apple IIC* and Apple Ile* with mouse card.

MacTRAC has all the features of the other trackballs, except the price.

MacTRAC is available in ADB (SRP $119) and DB9 (SRP $99) versions.

MicroSpeed 1-800-232-7888
International and California call (415) 490-1403 FAX (415) 490-1665

MicroSpeed and MacTRAC are trademarks of MicroSpeed, Inc. Other trademarks have been cited and MicroSpeed acknowledges them.

Please circle 129 on reader service card.
Word Processing

Setup dialog box. Both MacWrite II and WriteNow take into consideration other page-setup features, such as margins, and calculate the column width to make the columns equally wide. In WriteNow, the spacing between columns is determined by the left and right paragraph margins within the column. MacWrite II lets you specify the space between columns in the Page dialog box. You can also mark the Title Page box selection so that column settings don't apply to a particular page within your document. WriteNow also provides templates for making standard Avery labels.

Graphics. Chances are, one of the main reasons you wanted a Mac so desperately was for its graphics capabilities. All four programs let you place a graphic from the Clipboard into a document, and MacWrite II's Insert File command also lets you insert a MacPaint or PICT file without going through the Clipboard.

Both MacWrite II and WriteNow place the graphic within the line of text, and WriteNow lets you move the graphic up or down by superscripting or subscripting — both programs treat graphics in the same way as they treat text. WordMaker handles graphics much better than you would expect from a low-cost package, layering them separately from text. It even provides a word-wrap selection, which lets text flow around the outline of a picture (see Figure 11). Works also keeps graphics separate from the text and even gives you a drawing toolbox.

Mail-merge. We've probably all received that same sweepstakes letter — the one telling us we've won a trip to Coral Gables for the entire (your last name here) family. This is an example of mail-merge on a grand — in quantity, at least — scale. It lets you combine a data document that contains groups of information arranged in records (names and addresses, for example) with a form, or template, letter containing placeholders, or field names, for each item in the records (see Figure 10).

During a merge, the names, addresses, and other information (such as the balance due, in a billing letter) in the data document replace the field names in the form letter and generate a new, personalized letter for each record in the list. The techniques used to do this vary from program to program, but all four of the bargain word processors can do basic mail-merge. Works and WordMaker are also smart enough to print only a portion of the data file, as long as you tell them the correct record numbers.

Beyond basic field-name selection, MacWrite II and WriteNow offer powerful capabilities through the use of conditional statements. You can use IF/THEN/ELSE statements to specify if certain text should or should not be inserted into the final letter. For example, you can place a statement in your form letter to specify that if the data record at hand has a value greater than $0 in the Amount Due field, the program should THEN plug in the sentence “Please remit promptly.” If that's not the case (ELSE), the program should print the sentence “Thanks for keeping your account up-to-date.” Both programs

Figure 11: New Horizons WordMaker layers graphics separately from text. By shortening the margin for a text paragraph next to a graphic, you can accomplish the appearance of the automatic text-wrapping feature of high-end word processors.

On the Horizon

Bargain may take on new meaning when DeltaPoint's Taste ($149) is released. Announced in August '90 at an introductory price of $99, the program wasn't quite ready for shipping at press time. If it does all it promises — and does it well — it could give a lot of word processors a run for their money.

According to DeltaPoint, Taste is designed to be a full-featured word processor, providing tools such as style rulers; multiple stationery documents; automatic hyphenation; footnotes; endnotes; headers; footers; a 1.4-million-entry thesaurus and a 117,000-word dictionary; and mail-merge, which can be used with Taste's built-in address book.

But wait — there's more. Taste will also give you complete control over page layout, including the ability to create multicolumn pages and columns of varying widths and the ability to apply any layout to any range of pages in a document. And there's still more — a complete drawing layer with a full set of tools, the ability to import PICT and EPS files, and the ability to anchor pictures to a specific position on a page. Ah, so many features, so little money.

168 January 1991 MacUser
Publish-It! Easy
In Less Than an Hour.
The all-in-one desktop publisher for the rest of us.
Makes your document design fast, easy and fun!

Everything is Included.
Now you can bring words and graphics together to express your ideas like never before! Write a document, check the spelling, mix and match type styles, add graphics, and print it out, all in a few simple steps—all with one easy-to-use program. And get professional-looking results—every time:
- A Fully Integrated Word Processor
- A 112,000-Word Thesaurus
- A 240,000-Word Spell Checker
- Advanced Page Layout
- Built-In Drawing & Painting Tools
- A Quick-Start Mini-Manual
- 72 Sample Page Layouts

Special "What-if" Design Features.
Experiment with document design all you want. Easy's "Libraries" and Proxies let you alter page elements instantly—making changes and experimentation easier than ever before. When you're happy with the results, save it as your final document.

Try stretching or condensing your headline or body copy; or rotate text for special accents, or make your type textured or shaded. But don't think all these exciting capabilities are difficult. They aren't. They're Easy.

Automatic Everything.
If you're not sure about which type style is best, Publish It! Easy will automatically select the type for you. Change the shape or size of your text area, and Easy will automatically reflow the text to fit. Automatic headlines and subheads, automatic indentation, book binding margins, page numbering, on-line help. It's all automatic. You won't have much to learn or to do!

Publish It! Easy
We make desktop publishing easy. And at $249.95 (Suggested Retail), very affordable. In fact, with our 60-day full money-back guarantee and free 60-day technical telephone support, downright unbeatable!

Please circle 116 on reader service card.
also provide a way to combine two instructions so that more than one condition has to be met. This lets you, for example, specify that if a relative owes you money (<<IF relative=Yes>>, you can add "Please bring your checkbook when you come for dinner next Sunday."

If all this sounds a little too much like programming, you might be relieved to know that MacWrite II helps by providing menu-driven mail-merge. You place field names and conditionals in your document via the Open Merge Data File dialog box, where a scrolling list contains all the field names in the data document and all supported conditional commands. You can insert fields and commands by positioning the cursor in the form letter and double-clicking on the field name or command in the list. It can even place the field delimiters (« and ») around the field names for you (field delimiters tell the application that the field names are not simply text). In the other word processors, you must use a two- or three-key combination to place the delimiters around each field name.

Able-Bodied Bargains?

These low-cost word processors pack a lot of features for the dollar, but they still might not have enough. You can always give them a features booster shot by adding stand-alone programs for outlining, grammar checking, bibliography indexing, and the like (see "The Right Tools for the Write Job," September '90, page 241). Then again, if you're considering a bargain word processor because you're cost-conscious, the add-on route may not be very practical — it might be more cost-effective to buy a full-featured, higher-priced package such as Microsoft Word 4.0, Nisus 3.07, FullWrite Professional 1.5, or WordPerfect 2.0 ($395 each).

The Final Word

Investing in a Mac doesn't end when you bring the hardware home. You need software, and one of the first programs most people buy is a word processor. Many high-performance, high-priced word processors are available, but if you're cost-conscious — and a little reluctant to tackle a program that puts the power of a publishing house onto your desk — you still have a respectable field of candidates to choose from.

Each of the word processors we tested offers features such as headers and footers, search and replace, stationery documents, mail-merge, and spell checking. MacWrite II and WriteNow offer more-advanced variations of some of these features, particularly mail-merge. These two programs also provide more-advanced capabilities — footnotes, snaking columns, and speed-formatting techniques akin to style sheets, for example. WriteNow's speed is hard to beat, but MacWrite II offers many dialog-box-driven functions that make it extremely easy to use for functions that can be difficult to master, such as mail-merge. If you don't expect ever to need advanced capabilities such as the ability to create footnotes or columns, WordMaker should be sufficient — it's both fast and simple. Finally, even though Microsoft Works' other software modules — database, spreadsheet, and telecommunications programs — perform well, its word processor's performance is lackluster.

We tested each word processor for speed when performing common tasks, but raw performance shouldn't be the determining factor in choosing the ideal word processor — although you might want to avoid a real laggard. Speed is important, but determining your individual needs is always the first step. For our opinion, look at "The Bottom Line."

Charles Spezzano is the author of numerous articles and books about psychology and personal computers. Kellie Wilsch is a MacUser associate editor. MacUser Labs would like to thank Ron Gallagher for conducting the tests.
Microtek announces the end of the font wars. Introducing the first TrueImage printer.

Introducing the Microtek TrueLaser printer. A revolutionary new laser printer that gives you TrueImage plus PostScript and PCL compatibility. All for less than $2700.

This is the first printer to bring TrueImage technology to your desktop. Giving you absolute WYSIWYG fonts. With faster on-screen display. And faster printing.

TrueImage is the new printer standard. It contains TrueType, the same font technology that will go into every Macintosh running System 7.0 and IBM PC running Windows.

Which is why the world's leading font foundries are already designing with TrueType.

But it's comforting to know you won't have to leave your past behind. Because TrueLaser is also PostScript compatible, so you can continue to use your current library of PostScript fonts.

For added versatility, TrueLaser even gives you PCL printer emulation.

What's more, TrueLaser is powered by the fastest microprocessor available today, the AMD 29000. Resulting in performance far superior to the 68000 or 68020 microprocessors found in most laser printers. Which means you'll spend a lot less time waiting to see what your work really looks like on paper.

And you can choose between AppleTalk, Centronics and RS-232C connections. But whatever you choose, TrueLaser's 300 DPI resolution will have all of your graphics and layouts looking their best.

Call 1-800-654-4160 or in California, 213-321-2121 for the name of the authorized Microtek dealer nearest you.

And get a real close look at the laser printer that's brought an end to the font wars. It'll make you look like a winner.

MICROTEK
Better Images Through Innovation.
### Table 1: Features of Bargain Word Processors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Claris MacWrite II</th>
<th>Microsoft Works 2.00</th>
<th>New Horizons WordMaker 1.01</th>
<th>T/Maker WriteNow 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$249</td>
<td>$295</td>
<td>$124.95</td>
<td>$199</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of basic application</td>
<td>451K</td>
<td>591K</td>
<td>139K</td>
<td>129K</td>
</tr>
<tr>
<td>Size fully configured</td>
<td>1.319K</td>
<td>910K</td>
<td>396K</td>
<td>242K – 1,203K</td>
</tr>
<tr>
<td>Memory required</td>
<td>1 megabyte</td>
<td>768K</td>
<td>512K</td>
<td>200K – 475K</td>
</tr>
<tr>
<td>Spelling-dictionary size (words)</td>
<td>100,000</td>
<td>60,000</td>
<td>100,000</td>
<td>50,000 or 135,000</td>
</tr>
<tr>
<td>Thesaurus size (words)</td>
<td>660,000</td>
<td>NA</td>
<td>NA</td>
<td>1,400,000 or 470,000</td>
</tr>
<tr>
<td><strong>Characters/fonts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Font sizes available (points)</td>
<td>1 – 500</td>
<td>1 – 72</td>
<td>4 – 127</td>
<td>4 – 127</td>
</tr>
<tr>
<td>Small caps</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Strike-through</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Extend/condense</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Show nonprinting characters</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Math typesetting</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Find/change</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tab/Return</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Wildcard</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Formatting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum page width</td>
<td>limited by printer</td>
<td>15 inches</td>
<td>limited by printer</td>
<td>limited by printer</td>
</tr>
<tr>
<td>Style sheets/speed formatting</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Page number, time/date stamps</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Change case</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Auto-numbered footnotes</td>
<td>end of page/document</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Graphics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Import via the Clipboard</td>
<td>• plus Insert File command</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Drawing tools</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Headers/footers</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Accepts graphics</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Odd/even-pages option</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Multiple</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Page makeup</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum number of columns</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Auto-parallel columns</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Snaking columns</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Text wraps around graphics</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Create boxes or borders</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Leading/line-spacing control</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paragraph sorting</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Mail-merge</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Keyboard sentence select</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Keyboard paragraph select</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

*This is the mouse rating for the package as a whole; the word-processing module alone is worthy of a three-mouse rating.
Introducing M.Y.O.B. 2.0
Incredible Accounting Software!

M.Y.O.B. combines a powerful, fully-integrated accounting program with management tools you can’t find anywhere else! With just a few clicks, you can control every facet of your business...print your financial reports, reconcile your checkbook, update receivables, reorder inventory, print mailing labels, even call your customers — all with M.Y.O.B.

M.Y.O.B. Features...

- **General Ledger**: Flexible chart of accounts • Analyze profit & loss • Analyze balance sheet • Recurring entries • Budgeting
- **Checkbook**: Print checks • Reconcile accounts • Cash Flow • Recurring checks • Recurring deposits
- **Accounts Receivable**: Item invoices • Service invoices • Statements • Receivables analysis • Sales analysis
- **Accounts Payable**: Purchase order control • Auto-calculate taxes • Auto discounts • Easy posting • Multiple payments • Auto purchase journal
- **Inventory**: Retail items • Service items • Manufacturing items • Auto pricing • Inventory analysis • Auto adjustments
- **Card File**: Track customers • Vendors • Prospects • Employees • Contact log • Mailing labels • Personalized letters
- **Administration**: Business calendar • Receivable alerts • Payable alerts • Order shipment reminders • Auto inventory reorder • Re-contact reminders

M.Y.O.B. 2.0 - Exciting New Features

- Fully Customizable Checks, Invoices, Statements, Purchase Orders, Mailing Labels • Auto-Build Inventory • Expanded Card File • Auto-Reverse Invoices • Expanded To Do List • More Flexible Reporting and much more!

Thousands of users agree with the experts...

- "Using M.Y.O.B. is simple and direct."
- "MacWorld"
- "There are several unusual features that make the program easy to set up, easy to learn and easy to use."
- "MacWeek"
- "Setting up the system is really easy."
- "MacWorld"
- "...the best business deal on the Mac." - MacUser

NOW AVAILABLE AT YOUR SOFTWARE DEALER!

SUGGESTED RETAIL PRICE $249.00

CALL TODAY! 1-800-322-MYOB

Send me a fully-functional Demo Disk for only $5.00!

Name___________________________
Address_________________________
City________________State________Zip________

Daytime Phone __________________

Preferred payment method (check one)

☐ Check or money order enclosed  ☐ Visa  ☐ MasterCard

Card No.________________________Exp. Date______________

Signature_________________________

Mail to: TELEWARE
22 Hill Road • Parsippany, NJ 07054 • 201-334-1154
BUYING SMART

You don't need technosmarts to choose the right hardware and software. Here's some help from MacUser — and Mr. Smart Consumer himself, David Horowitz.

If you have a valid credit card and can dial a toll-free number, you have about all you need to buy computer equipment and software these days. And in a perfect world, this would be enough to bring you perfect satisfaction. The product of your dreams would be delivered to your doorstep overnight at minimal charge, it would do everything you hoped for (and more), and it would never break down.

In the real world, unfortunately, things rarely work out this way. Remember the time you ordered that nifty grammar checker, only to find out it wasn't compatible with your version of Microsoft Word? Or when you needed to get a graphics program overnight for a special client? Yes, the program arrived — two weeks later —
but the client (and his money) was long gone. And speaking of going out of business, what about the company that declared bankruptcy right after you sent in your printer for repair?

There's no way to anticipate every disaster—it really is just a coincidence that your hard drive died a day after the warranty expired. But before you plunk down your hard-earned cash for the latest in Mac goodies, you need to arm yourself with common sense, research, and a basic knowledge of consumer rights. This article supplies the ammunition, including a rundown of the questions to ask before, during, and after the sale; advice on mail order, warranties, and service contracts; and tips on finding a good dealer. Once you have this shopping savvy, you should be able to get the best deal with a minimum of unpleasant surprises.
Buying Smart

Before You Buy

First, you need to know exactly what you want to buy and why you need it. Whether you're buying a word-processing program or a laser printer, there will be several candidates to choose from. You can simplify your search by comparing your requirements with the products' features.

Start by figuring out what your needs are. If you're buying a word-processing program, for example, do you write simple letters and memos or do you need sophisticated formatting such as multicolumn layouts and drop caps? What's your price range? If you're buying hardware, how much use will the product get and how many people will be using it? What software will you be using with it? What are the upgrade options?

Once you know what features you want, you can start comparing products. To gather information, quiz other users — friends, coworkers, bulletin-board users, or user-group members. Some companies let you borrow products for free trial periods; others allow you to download demonstration packages from bulletin boards. (These programs are almost identical to the actual product, except that some features, such as printing, are disabled.)

Many computer magazines review software and hardware; you'll find them at libraries, bookstores, and newsstands. Although MacUser's mouse ratings, for example, are a quick and easy way to weed out products that are substandard or that you don't want to consider, don't base your buying decision on ratings alone. You need to read the entire review to get a better picture of the product and its features and to put the grade into perspective. One product may be rated highly for features that you don't need; a slightly lower-rated product might have fewer features but a set of abilities that suits you better. If more than one product is reviewed and the results are close, look carefully at the criteria used to make

Tips for First-Time Buyers

David Horowitz — radio and television consumer commentator, syndicated columnist, and host of the TV show "Fight Back! with David Horowitz" — bought his first computer a few years back. Here he shares some tips with first-time buyers.

Buying a computer and accessories can be a complicated business with plenty of traps for the unwary. But whether you're buying a computer or a TV set, the rules are the same: know your needs, shop and compare, stay within your budget, check out the warranty, and deal with a reputable retailer. Here are a few guidelines that will help guarantee your satisfaction.

Cash or credit? Many buyers prefer to pay cash rather than to use a credit card for major purchases. But you may be better off using your credit card and then paying it off before you accumulate significant interest charges. The primary advantage is buyer protection. If what you bought is not delivered as ordered, if it's defective, or if it's not as advertised, you can contest the charge to your credit-card company. You'll be credited for the amount of your purchase without having to fight with the retailer about it. That's the way, in addition, certain credit-card companies will extend your warranty if you use their card to make your purchase.

Mail order or dealer? If you don't know whether to buy from a dealer or a mail-order house, here are a few points to consider. The primary advantages of dealing with a computer store are that you get personal service and the chance to play around with the equipment or software you're thinking of buying. Also, if you have any questions, there's someone there to answer them; if you have a problem later on, the retailer is there to make it right (assuming you didn't pick a store on the brink of bankruptcy).

The most obvious advantages of buying by mail are price and convenience. Not only do mail-order houses offer hefty discounts, but you may also avoid paying your state's sales tax if the company is not in your state (your state franchise-tax board can tell you if this is true where you live).

There are other advantages to buying mail-order goods. Federal trade regulations require that mail-order retailers deliver the goods within 30 days or offer you the option of waiting for shipment or taking a refund. When ordering by mail, however, be sure you understand the company's return policy. Will the retailer refund your money if the particular piece of hardware or software doesn't suit your needs? Some retailers will; some won't.

New or used? Buying through swap meets, back-alley shops, and gray-market retailers is risky business — a bit like investing in junk bonds. The profits (or in this case, the savings) may be considerable, but so are the financial hazards. If the merchandise is new, then you're covered by the manufacturer's warranty, but that's all. There is no after-sales service or support once the seller's disappeared.

You can't take warranties for granted, especially with gray-market merchandise. These are goods manufactured for sale

Like most first-time computer buyers, consumer pundit David Horowitz vastly underestimated his needs. "I thought I was overbuying, but it's turned out to suit me just fine," he says.
ties are void in this country. Some gray-market dealers offer their equipment before you buy, or if you want expert advice offered by lower-rated products. In other words, do your homework.

Shop Around

After you've decided what to buy, you next have to decide where to buy it — from a dealer or computer store or through a mail-order company (see the “Tips for First-Time Buyers” sidebar). If you want to try out the equipment before you buy, or if you want expert advice when buying expensive or high-end software such as an accounting or CAD package, doing business with a reliable local dealer is generally the best way to go (see the “Finding a Good Dealer” sidebar).

Mail order is a good bet for most software and non-Apple hardware. Most mail-order houses offer big discounts — sometimes as much as 40 to 60 percent off list price — and have good return policies. The larger companies keep nearly every software title in stock, and many offer overnight delivery for $3 to $5. Many mail-order houses offer 120-day repair or replacement policies and will refund most purchases if you return a product within 30 days. Large mail-order houses often provide cheap or free technical support over the phone overseas. The equipment itself may be fine, but the factory warranties are void in this country. Some gray-market dealers offer their own warranties, but they're only as reliable as the retailers who back them up. How can you tell if a piece of equipment is being sold on the gray market? Federal law says you are entitled to read the warranty before you buy. If it's an original U.S. manufacturer's warranty, the product is probably not gray-market. But if it's only a store-backed warranty, it's a good bet that you may be buying gray-market equipment. Ask questions before you buy.

A used computer or discontinued model may be a good deal if you don't need all the speed, power, and memory of the newest model. But a machine that was state-of-the-art just a couple of years ago may not run today's more powerful software. More importantly, manufacturers may not supply replacement parts for discontinued models. Many manufacturers may not even be in business any longer.

For example, a writer I know wanted a Mac but couldn't afford a new one, so he bought a reconditioned Lisa from an out-of-state distributor. He loves it, but as far as Apple is concerned, the Lisa is history. He relies on the far-away retailer for replacement parts and on a local computer store where a technician happens to be familiar with the Lisa. If you're buying a used or discontinued model, decide whether you want to take chances. (As far as recently discontinued models, such as the Mac Plus, are concerned, Apple has said that as long as there's a demand and an installed user base, it will continue to provide service and support and develop software for these products.)

Basic common sense is your best resource, whether you're a first-time buyer or a seasoned consumer. By doing some research and knowing your rights, you'll end up getting the most for your money.

Whether you're buying from a dealer or from a mail-order house, find out exactly what you're going to get for your money. Ask what manuals and installation guides accompany the product and, with software, how much memory you need to use the program adequately. Is the product compatible with your system? Do you need to buy anything extra to install, set up, or use the item? Many mail-order houses buy their products from distributors rather than from manufacturers. When distributors buy and package components sold by factories, they often include parts — such as cables, utility software, or manuals — from various sources. Sometimes distributors sell deluxe packages that include specialized manuals and bonus utility software, but in other cases, the price the mail-order house quotes doesn't include the accessories you want, such as cables. The only way to find out what's included is to ask.

Read the Warranty

Now that you know what to buy, find out what protection is available to you if the product is defective or doesn't meet your expectations. Manufacturers guarantee almost every product with a warranty, which is usually an agreement to replace the product and documentation if you discover defects in the materials or workmanship during a specific time period after purchase. The warranty should state exactly what the manufacturer does and doesn't cover. For information about warranty terms, see the “How to Read a Warranty” sidebar.

Warranties typically cover time periods ranging from three months to a year, although some warranties, particularly those covering less mechanically complex products, last several years. Some go even further — Panamax, for example, provides a lifetime warranty on its entire line of surge protectors and offers free repair or replacement of any equipment that's damaged by surges while it's connected to a Panamax surge protector.

A warranty does not protect you if you buy the wrong product. If you can run the program on your computer, many manufacturers will insist that they have lived up to their end of the bargain. Even a buggy program isn't necessarily covered for replacement. When a warranty does cover a product's problem, you are usually financially responsible for delivering the merchandise to the factory for repairs or replacement, while the manufac-

Basic common sense is your best resource, whether you're a first-time buyer or a seasoned consumer. By doing some research and knowing your rights, you'll end up getting the most for your money.
Buying Smart

turer covers only the cost of return postage or delivery after repair. This should be stated in the warranty.

Few companies specify how quickly they will complete warranty repairs. Before you buy, try to find out how long you’ll have to wait for a company to repair or replace a product. Also ask whether the manufacturer has a tracking system that gives you updates on the status of repairs. Even though a warranty might cover the cost of fixing your printer, having to wait three months for the repair to be completed renders the warranty practically useless.

Compare warranties when you’re deciding among otherwise equivalent products. If a dealer makes any undocumented promises about a product’s features, get them in writing. You might need this written evidence later for legal ammunition. If a product breaks down and your warranty has expired, be persistent. A sympathetic manufacturer might still replace your product for free.

Protect Your Investment

When you’re buying hardware, the length of the warranty becomes especially important. Once you’re no longer covered by the manufacturer’s warranty, repairs and service can be both costly and inconvenient. Usually you can rely on a dealer for servicing on a time- and materials basis, just as you might rely on a local mechanic to service your car; you’re charged for labor, materials, and the cost of parts. The cost of labor and materials will typically range from $50 to $75 per hour, and the cost of materials.

You might consider buying an extended warranty that will cover you after the manufacturer’s warranty has expired. In many cases, you’re taking a gamble based on the hardware’s reliability. Products, such as printers, that have several mechanical parts are more likely to break down than equipment, such as modems, that has few moving parts. Machines you use a lot or that you frequently move around, such as printers or portable hard drives, tend to break down more often than hardware that experiences less wear and tear.

You should consider purchasing an extended warranty especially if your equipment is protected by a short-term warranty. For example, in the case of equipment from major imagesetting companies that offer only 90-day warranties, such as Linotype and Agfa Compugraphic, extended warranties are almost a necessity. And if you can’t afford to be without your hardware for any length of time, it’s smart to invest in a service contract that makes provisions for loaner equipment for customers who are waiting for repairs.

Finding a Good Dealer

“Well, see, the drive on my lili went out on me. I took it to my regular dealer, who immediately replaced the drive at no cost and then treated me to dinner and a movie before driving me home.”

The above scenario is, of course, a complete fabrication. We’re all looking for that Great Apple Dealer who can solve any problem quickly and effectively, with a smile and a hot towel. Some of us are even willing to settle for a place where we can explain a problem without having to rely on elaborate hand gestures (“It’s grayish and round, you see, and has little pins sticking up inside it . . .”).

Unfortunately, there’s no surefire scheme for finding a good Apple dealer. There are some ways you can evaluate a local dealer, though, that will help you separate the Alpo from the prime rib.

Location. A shop within walking distance of a college is often your best choice. Students and faculty are a funny mix of different demands and problems, and it’s here on the front lines where the truly great stores flourish and the bad ones go AWOL. Visit the stores on your state’s border too—especially if the bordering state imposes no sales tax.

Stock. Any store can sell PageMaker, Excel, and MacWrite II. Good stores also sell more esoteric software and hardware such as MIDI interfaces, programming languages, and Excel templates. And games. Somehow I can’t trust a store that has a whole shelf full of WingZ but not one single copy of The Fool’s Errand or Falcon.

A magazine rack is also desirable. I consider it a very healthy sign for a store to devote valuable floor space to $4 items such as Dr. Dobb’s Journal and MacTutor.

Salespeople. One way to find out if you’re dealing with a knowledgeable salesperson is to ask about the different virus killers in the Mac community. A salesperson who doesn’t mention Disinfectant (a free virus killer that seems to be supported by the whole planet) is either pitifully lacking in knowledge or is intent on selling you a commercial utility. There’s nothing wrong with recommending a commercial program, but completely ignoring a significant product such as Disinfectant is a warning sign that something’s screwy.

You can gauge salespeople’s depth of knowledge pretty easily. Ask them what the best spreadsheet or database program is. If the first response is “How much do you want to spend?” you may want to try another salesperson or another store. “Why do you want to buy a spreadsheet program?” is the most helpful thing a salesperson can ask; it shows that they’re inclined to sell you the software that’ll suit your needs, rather than the most expensive package you can afford.

Service. The best way to get an accurate feel for the quality of service you’ll receive from a particular dealer is to wait for your equipment to fail (and you’d hardly get dizzy holding your breath waiting for that to happen, eh?). The second-best way is to ask around for opinions, especially at a user-group meeting. Expect a lot of recommendations of places to avoid—a poke in the eye is remembered far longer than a kiss on the cheek. Be aware, however, that these opinions may be somewhat loopy. Ask for specific examples of bad service and what the dealer did (or didn’t do) to correct the problem.

You can also check out a service rep by asking a couple of strategic questions. Claim that you’ve lost the ball to your mouse. If the reps try to sell you a new mouse, run screaming for the car.
Companies with a heavy hardware investment should consider special maintenance options besides extended warranties. Here are some of the more common options for corporate Mac owners:

**Manufacturer's contract.** This type of extended warranty is expensive — about 10 to 15 percent of the hardware’s original cost per year. AppleCare is a plan that covers the cost of parts and labor at any of 2,000 authorized Apple retailers nationwide. You can purchase the plan by the month for up to 36 months. For example, protecting a Mac SE costs about $21 a month; protecting an IIfx can cost up to about $75 a month.

The manufacturer’s contract is more reliable than an individual dealer’s, as the manufacturer is less likely to move or go out of business, but you should read contract conditions carefully. For example, AgfaCare is an extended warranty for purchasers of Agfa Compugraphic equipment. It promises you one free month of service if your broken machine is not running within 16 hours after a service representative arrives, but you will receive the free month of service only if you renew your service contract for another year.

**Third-party maintenance.** Some third-party repair services offer on-site repairs or loaner machines while you wait for off-site repairs. Their quality of service can vary, however, so check out credentials and ask for recommendations before entrusting them with your valuable equipment. Check out the charges carefully, too. If your office isn’t located near the repair service, find out if the company adds a “zone” charge, which can often range from $100 to $400.

**Internal program.** If you can’t afford downtime and your company owns many computers and peripherals, you may want to hire an in-house technician specifically to maintain your hardware and software. In addition, save your outdated equipment and consider purchasing extra equipment to use as backups in an emergency.

**Winning the Waiting Game**

No matter how much preparation you put into choosing the right equipment or software, you rarely get instant gratification. You may wind up waiting a lot — for your product to arrive, for a company to return your phone call, or for repairs to be completed. After a while, you may get tired of the waiting game. At that point, it’s time to consider some detours.

**Know your consumer rights.** If you haven’t received your new product in a reasonable amount of time, you have certain rights guaranteed by law. According to the Federal Trade Commission, if a seller quotes a delivery date, you must receive your product by that date. If no date is quoted, the seller must ship the product within 30 days of the date of purchase or notify you in writing of the new delivery date. If you don’t have the product or notification within 30 days, you have another 30 days to cancel the order; after canceling you should receive a full refund within 7 business days of the cancellation or, if you used your credit card, within the next billing cycle.

**Make a lot of noise.** If a company is not offering the help you want or a prompt, reasonable response to your complaint, be pushy. Companies are more likely to notice you if you demand attention.

**Complain early and loudly.** Write a short and civil letter to the president of the company; to ensure delivery, mark the envelope “Personal.” Specify exactly what you want and when you expect to receive a response. One letter can have amazing effects; if it doesn’t, write again and call. Document everything you do, and note whom you’ve spoken to. Keep warranty numbers and receipts.

**Alert the public.** Contact user groups, on-line services, and your friends and colleagues. Find out if others have had similar experiences, what they’ve done, and what satisfaction they’ve received.

**Write letters.** If the company advertises in a magazine,
Buying Smart

write to the magazine. At MacUser, for example, we monitor complaints about advertisers and help consumers contact a company and resolve their problems. Send letters regarding MacUser advertisers to Telemarketing Assistant, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Contact consumer organizations. Depending on the severity of the problem, there are several organizations you can turn to for additional help. One of these is the Direct Marketing Association (DMA), a 3,500-member organization that attempts to resolve problems with mail-order firms. Send a copy of your receipt and a request for a complaint form to Mail Order Action Line, Direct Marketing Association, Six E. 43rd Street, New York, NY 10017.

Do the same with the Federal Trade Commission's Enforcement Division, which keeps track of complaints. Contact the Better Business Bureau (BBB) in your area. BBBS are funded by businesses for the purpose of self-regulation—they'll follow up complaints and provide mediation or arbitration if you want it. Also contact the Chamber of Commerce in the company's city and the consumer-protection office in that state. Finally, if you're dealing with mail order, notify the postal-inspection division of your local post office, which can take civil action or refer the case to the U.S. attorney general for criminal action. If a company goes bankrupt, you can make a claim in federal bankruptcy court (see the "When a Company Goes Bankrupt" sidebar).

Happily Ever After

You've received your new hard drive or accounting package, and it's exactly what you wanted. That's great, but it's not the end of the story. Don't forget to send in the product's registration card. (But first make sure that you're happy with your purchase. If you decide to return the product, you'll usually need the complete package, including the registration form, in order to receive a refund or an exchange.)

There are several advantages to being a registered user. If the manufacturer finds a defect or produces an upgrade, you will usually be notified or the upgrade will be sent to you automatically. This kind of upgrade replacement or repair (this is a common practice). Avoid companies that charge an excessive fee (sometimes called a restocking fee) for returned products.

6. What is the average turnaround time on repairs or to receive a replacement?

This is an important question—that low-priced hard drive won't seem so cheap if you have to wait three months for it to be repaired.

7. What do repair policies include?

For example, when your hard drive is repaired, will the manufacturer help you recover lost data or does it only replace the drive? Will the company provide you with a loaner while you wait for repairs?

8. Is the price realistic?

Look through various advertisements to compare product prices. The two lowest prices you find should be similar. Confirm the price before ordering; many companies change prices without notice. Ask if there are additional charges such as a membership or service fee or if a surcharge is levied on credit-card purchases. Ask for a lower price; they can only say no.

9. Do you accept major credit cards?

Being able to pay by credit card offers you many advantages (see the "Tips for First-Time Buyers" sidebar). Credit cards can also push up a company's overhead costs, however, so some smaller companies may choose not to accept all credit cards.

10. Is there a toll-free technical-support line?

A toll-free tech-support number is convenient, but check it out. Call the number to verify that it exists, and ask during what hours help is available. Watch out for companies that have 900-prefix numbers for information or tech support. These calls aren't free—you're charged for each minute you're connected.

Ten Questions to Ask a Mail-Order House

If you're willing to do a little research, you can purchase both software and hardware at a mail-order house at significant savings. The following questions will help you determine if a mail-order house is reliable. (Many of these questions apply to dealers too.)

1. Is the merchandise I want in stock now? If it's not in stock, find out exactly when it will be shipped to you.
2. Are there various shipping methods from which to choose? Check the cost and speed of each method. If you need same-day or next-day shipping, find out first what you'll be charged and what carrier will be used.
3. If I use a credit card, will the charges be applied to my account only when merchandise is actually shipped? Don't take no for an answer. This is standard business practice.
4. How long has the company been in business? Just because a company is young doesn't mean it's a fly-by-night organization. However, you should ask a few questions when dealing with a company for the first time—when did it start selling Mac products, for example, and can it give you references to contact. You can also leave a message on your local bulletin board or on 2Mac asking other customers for their experiences.
5. If you get burned by a company, take advantage of organizations that protect consumers from illegitimate business practices. Call the attorney general's office of the state in which the company is located, the county consumer-fraud unit, the postal inspector, and the Better Business Bureau.
6. What's your return policy? Look for mail-order houses that offer their own or third-party warranties as well as money-back guarantees or trade-in policies for customers who are not happy with their original purchase. Find out if you'll have to pay for shipping back a product that needs replacement or repair (this is a common practice). Avoid companies that charge an excessive fee (sometimes called a restocking fee) for returned products.

7. What is the average turnaround time on repairs or to receive a replacement?

This is an important question—that low-priced hard drive won't seem so cheap if you have to wait three months for it to be repaired.

8. What do repair policies include?

For example, when your hard drive is repaired, will the manufacturer help you recover lost data or does it only replace the drive? Will the company provide you with a loaner while you wait for repairs?

9. Is the price realistic?

Look through various advertisements to compare product prices. The two lowest prices you find should be similar. Confirm the price before ordering; many companies change prices without notice. Ask if there are additional charges such as a membership or service fee or if a surcharge is levied on credit-card purchases. Ask for a lower price; they can only say no.

10. Is there a toll-free technical-support line?

A toll-free tech-support number is convenient, but check it out. Call the number to verify that it exists, and ask during what hours help is available. Watch out for companies that have 900-prefix numbers for information or tech support. These calls aren't free—you're charged for each minute you're connected.
How to Read a Warranty

Most people don't read warranties. But if you want to be a smart consumer, you must change your ways — the warranty tells you how long and to what extent you and your purchase are protected. With Apple's standard one-year warranty as an example, here's a step-by-step guide to some of the baffling terminology that finds its way into consumer-product warranties.

A Limited Warranty
Almost all warranties are limited in some way, so you'll probably never come across a "full warranty." Time limitations, for example, vary according to the manufacturer's discretion; limited warranty might refer to a warranty that covers 5 years or one that protects you for 60 days.

B Defects
A defect is anything that prevents a product from working as the manufacturer says it will. A hardware defect protected by a warranty is clear-cut — your machine doesn't work, and it is fixed or replaced. Limited warranty of fitness for a particular purpose. These are usually created by the manufacturer says it will. Hardware defect protected by a warranty is clearly upheld by the UCC: the implied warranty of merchantability and the implied warranty of fitness for a particular purpose. These are usually created by implication when software or hardware is sold, unless a disclaimer is made in the warranty, as in this case.

C Time Limit
Most warranties state the length of time they're good for, although manufacturers can extend warranties at their discretion. If your machinery breaks however, some manufacturers require you to make any claims within a stated period. Be sure to read the warranty to see if this requirement applies to your merchandise.

D Proof of Purchase
Always keep all receipts for your purchases, and send only copies (not the original) to the manufacturer.

E Express Warranty
Sometimes a warranty mentions the Uniform Commercial Code (UCC), which requires sellers to stand behind their express warranties. It also creates certain implied warranties (see item F), unless a disclaimer is made (as in this warranty). All states except Louisiana have slightly changed and adopted the UCC. According to the UCC, a seller creates an express warranty when he or she makes an affirmation of fact about a product's quality that might influence a buyer's purchasing decision. For example, if a dealer says that certain software will work with System 7.0 or "your money back," you can hold the dealer to those words. Whenever possible, get an express warranty in writing. That way, if a dispute arises, you can remind the dealer of what you promised.

F Implied Warranty
A sales transaction involves two important implied warranties, both upheld by the UCC: the implied warranty of merchantability and the implied warranty of fitness for a particular purpose. These are usually created by implication when software or hardware is sold, unless a disclaimer is made in the warranty, as in this case.

G Implied Warranty of Merchantability
This promises that a product is what it says it is and that it will do what you expect it to do. For instance, if you buy a box of blank diskettes and you are unable to format most of them, then the implied warranty of merchantability has been broken.

H Implied Warranty of Fitness for a Particular Purpose
Unlike the implied warranty of merchantability, this warranty is not automatically created with a sale. It is usually created when a dealer assures you that a product will fit your particular needs. If this warranty is violated, you are entitled to claim damages under a breach of warranty (unless the manufacturer disclaims it in the product's warranty, as is the case here).

I Consequential Damages
If, for instance, a program destroys your entire hard drive and causes you to lose a month's worth of work, you may be able to claim consequential damages, in which case the manufacturer would pay you for lost profit and lost work time. Not surprisingly, most manufacturers attempt to limit their exposure to having to pay for consequential damages by using language such as that in this warranty. (These attempts don't always stand up in court, however.)

J State Rights
Although laws regarding remedies for consequential damages or breach of warranty are fairly uniform from state to state, they may vary somewhat. The law requires the manufacturer to point this out in the warranty.
Buying Smart

policy is not uncommon with software and occasionally applies to hardware as well. For example, when Rodime discovered that the firmware in one of its drives prevented the drive from reading from or writing to certain portions of the disk, all registered owners received notices explaining the problem and offering replacement EPROM chips.

Some companies send mouse pads, bonus utilities and programs, or other freebies to registered owners. Other manufacturers mail out newsletters with tips on product use or offer discounts on new products. Even more important, many companies require that you register in order to receive technical phone support.

When a Company Goes Bankrupt

Last year my hard-disk drive went belly up. Luckily, it was still under warranty, so I sent it back to the manufacturer (Jasmine Technologies) for repair. Unfortunately, shortly after I sent it, the company filed for Chapter 11 bankruptcy protection and I, like many other people, was stuck without a hard drive. Through the trials and tribulations of trying to get either a drive or my money back, I learned a few things about dealing with companies going through financial difficulties.

Generally, insolvent companies declare either Chapter 7 or Chapter 11 bankruptcy. In Chapter 7, the company is sold or broken up to pay off the creditors. Chapter 11, on the other hand, allows the company some protection from its creditors while it is reorganized with a view to resuming business at a later date. When a manufacturer goes into Chapter 11, you have a limited number of options available to you. If you are lucky and the "orphaned" piece of equipment in your possession, you may find that other companies will honor the service contract or you may be able to find spare parts by contacting user groups and on-line services. If, however, you have already paid for but have not yet received an item or if you are waiting for an item to be repaired and returned to you, you have three choices.

1. You can decide it’s not worth the time and effort to try to get what’s owed to you, so you write off the money you spent on the product.

2. You can go through the legal system as a creditor. The firm handling the bankruptcy procedure will send you documents outlining the steps you must take to file your claim. You can expect to get back as little as five cents on each dollar or as much as the item’s full value, but be prepared to wait for your money.

3. You can do what I did: Try to make friends and influence people at the company so that you become more than just another name on a long list.

Before my drive broke, I had already been waiting for four months for an upgrade to it — then I found myself at the bottom of a long list of creditors. I had been calling technical support at Jasmine at least once a week for several months, even before the company declared Chapter 11. When I heard rumors that Chapter 11 was imminent, I started calling every other day. This personal contact served me well — I had a new drive a month after the company declared bankruptcy.

If you plan to make a pest of yourself, there are several things you should keep in mind:

• Don’t get angry. In most cases, the people you are talking to are not responsible for the current situation. They are probably overworked and in fear of losing their job and receive a lot of angry phone calls every day. The man I talked to at Jasmine repeatedly told me that he really wanted to help me, because I never yelled or got upset with him.

• Find someone who is actually in a position to help you. Getting names can be difficult, especially when employees are being laid off. Your best bet is to go straight to a supervisor or manager in the company’s technical-support or customer-service department. You can get these people’s names from an operator or receptionist. Make sure to get the phone extension of the person you want to contact so you can call directly.

• Be persistent — if your calls aren’t being returned, leave lots of messages. I was constantly apologizing for calling so much, but that didn’t stop me from continuing to call. Remember — you want to stand out from the crowd.

• Be willing to make compromises, and don’t quibble over minor matters such as who pays for shipping. This should help hurry things along.

Regardless of how you decide to handle the situation, you will still be faced with the problem of operating without the equipment or software for what could be a long time. Usually you can find another brand of software that will serve your needs, but hardware can be more of a problem, especially if the equipment is something crucial such as a hard drive or printer. Always try to have a backup plan in place — ask if loaners are available before you return hardware for repair, and consider renting if it looks as if there might be long delays.

As a final note, don’t give up hope until the company has completely folded. Jasmine is a case in point — the company reorganized and resumed shipping (and repairing) its hard drives in July 1990, four months after declaring Chapter 11.

— Margy Kuntz

Shelley Zelman, a MacUser intern and a junior at Yale University, uses her consumer wisdom to select her favorite pizza in New Haven, Connecticut.
No other Data/Fax Modem gives you so many exclusive features...

...including network capability!

MAJOR FEATURES:
- 9600 bps send/receive fax
- Network fax capability
- Grey scale fax capability
- Online help
- Color icons
- Import/export phone book data
- Background operation
- Scheduled transmissions
- Custom cover page
- Activity log
- Fax fonts included
- Magnification (75/100/200/300)
- Converts to TIFF/PICT files
- Excellent status reporting

Since this is a software upgrade, you too can get the network feature on the ProModem that you already own!

COMPLETE NETWORK FAX SOLUTION!
ONE FAX MODEM SHARED ON YOUR NETWORK! LOW, PER-STATION COSTS!

The 9600M Network
9600 bps V.32 modem/9600 bps send/receive fax with MNP-5 and V.42......$1495.

Maxfax Network
2400 bps V.22bis modem/9600 bps send/receive fax......$995.
Tomorrow's Upgrade For Your Mac Is Only $59*

A MacWAREHOUSE Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC
Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION
Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMs. Our FREE video will give you step-by-step installation instructions. Every type of Mac is covered and we think we've made it a breeze.

WHAT DO I NEED?
Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ $59 ea.).

TO UPLOAD A 4-SOCKET MAC PLUS OR SE TO THIS AMOUNT OF MEMORY

<table>
<thead>
<tr>
<th>To upgrade</th>
<th>Do this: (Install in multiples of two only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2MB</td>
<td>Remove all four existing 256K SIMMs; install four 1 MB SIMMs; leave two sockets for future expansion.</td>
</tr>
<tr>
<td>2-1/2 MB</td>
<td>Remove only two 256K SIMMs; install two 1 MB SIMMs.</td>
</tr>
<tr>
<td>4 MB</td>
<td>Replace all four 256K SIMMs with four 1 MB SIMMs.</td>
</tr>
</tbody>
</table>

TO UPLOAD AN 8-SOCKET MAC II, IIx, Iic or SE 30 to this amount of memory:

<table>
<thead>
<tr>
<th>To upgrade</th>
<th>Do this: (Install in multiples of four only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MB</td>
<td>Remove all four existing 256K SIMMs; install four 1 MB SIMMs; leave remaining sockets for future expansion.</td>
</tr>
<tr>
<td>5 MB</td>
<td>Keep existing 256K SIMMs; install four 1 MB SIMMs; leave remaining sockets.</td>
</tr>
<tr>
<td>8 MB</td>
<td>Remove all four 256K SIMMs; install eight 1 MB SIMMs.</td>
</tr>
</tbody>
</table>

WHAT YOU NEED TO KNOW
Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products. Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100ns SIMMs is $59. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

SPEED
Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor reads 120 ns (or faster) chip, and the 68030 like the speedier model.

OVERNIGHT DELIVERY
Place your order by 12:00 am (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

1-800-255-6227

Call toll-free
Twenty-four hours a day, seven days a week.
Inquiries: 1-908-367-0410
Fax: 1-908-905-9279
© 1990 Macwarehouse Inc.

MacWAREHOUSE 1-MONTH MONEY BACK GUARANTEE
If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWAREHOUSE also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

* SIMMs prices vary. Call for latest information.
** Limited Offer: Free video with purchase of 2 or more SIMMs.
QuarkXPress® has long been the professional's choice for publishing software worldwide because of its powerful and precise type handling, page layout, and graphics production features. The new 3.0 version delivers all these, with a redesigned interface and clear, comprehensive documentation that make QuarkXPress easier than ever to use.

**Interactive and Effective**
QuarkXPress 3.0 provides an array of interactive palettes that make it simple for new and experienced users alike to create effective, high-quality publications. A document layout palette enables you to insert, delete, and move pages easily by dragging page icons. And the new Library palette provides an easy way to store text and graphic items for use whenever they're needed.

**Text Creation Simplified**
QuarkXPress offers full-featured WYSIWYG word processing and editing capabilities that give you the look and feel of your document while you're creating it. The Global Spelling Check and Find/Change features make fine-tuning easy.

**A Tradition of Precise Type Handling**
QuarkXPress 3.0 continues a tradition of providing the most precise, flexible type handling of any comparable program. You can adjust font, size, style, leading, location, and angle of rotation in fractions of degrees, right on the screen. Whether you're creating automatic drop caps or editing already-rotated type, QuarkXPress 3.0 delivers the power and freedom you need to create the most eye-catching text possible.

**The Designer's Choice**
Because of the power and responsiveness of its page layout features, QuarkXPress is now the top choice of designers around the world. The program's advanced capabilities — including the rotation and skewing of graphics, picture box reshaping, rotation of text, and the creation of bleeds — make QuarkXPress the most flexible page layout program around.

**Complete Control Over Color**
With QuarkXPress, you can apply process or spot colors to any EPS graphic. What's more, you can create color separations without resorting to an add-on program. Besides supporting the PANTONE MATCHING SYSTEM®, as well as RGB, CMYK, and HSB models, version 3.0 provides precision controls for trapping and other sophisticated prepress effects.

**Easy To Learn And Use**
Even if you've never used QuarkXPress before, you'll find this 3.0 version simple to learn and explore. The handy on-line Help system and clearly written user manuals that come with the program—in addition to the step-by-step, self-paced tutorial—quickly put you in charge of the most powerful publishing tool of its kind.

**Overnight Delivery Only $3.00**
QuarkXPress 3.0 is available now—and you can have it tomorrow. Order before 12:00 midnight (E.S.T.) and we'll ship overnight for only $3.00. When it comes to getting the newest products at the best prices, nobody beats MacWAREHOUSE—nobody!
A powerful precision drawing tool for scaled drawings, illustrations, presentations and general purpose graphics. Includes an array of drawing tools and advanced illustration features like parallel line tool, extend lines to intersection, glue and unglue, trim tool with true associative dimensioning and optional keyboard editing. $319.

**New Feature!**

MOBIUS PRODUCTS
- Fanxy Mac GT ........................................... 55
- SE Silencer .................................................. 79
- Scissors ..................................................... 59
- DS/DD (box of 10) ........................................ 13
- Targus, Ltd. .................................................. 99
- Mirage II Carrying Case (black) ............. 69

**ACCESSORIES**
- B.A.S.F. made in U.S.A .................................. 14
- DS/DD (box of 10) ........................................ 13
- DS/DD High Density (1.44 Mb) ................. 24
- Basic Needs, Inc. (full line available) ... 47
- Mac II and older keyboard ...................... 12
- Mac Illi Monitor Stand ............................... 11
- Universal Laser Printer Stand ................. 26
- Utility Pac .................................................. 10
- Curtis Command Center ............................ 49
- Ergotron MacTilt-SE/Plus ......................... 68
- MacTilt II-RGB ............................................. 70
- I/O Design ImageFlex II Carrying Case ...... 49
- Macinward Mac II Carrying Case ............. 85
- Macinward Plus Carrying Case ............... 84
- Macinward SE Carrying Case ................. 79
- The Ultimate SE Carrying Case .............. 79
- The Neon Ultimate Carrying Case .......... 89
- Kensington Anti-Glare Filter ....................... 32
- Apple Security System ............................... 34
- LaserWriter II Security System ............... 37
- MasterPlace Mac II ..................................... 102
- PowerBacker 500 UPS ............................... 269
- SE Radiation Shield ................................... 32
- System Saver Mac ..................................... 63

**ACCOUNTING & PERSONAL FINANCES**

**NEW FEATURE!**

**Buy 1... Get the Other FREE!**

- **Full Impact 2.0/FullWrite Professional 1.5 (Ashton-Tate)**
  - Buy Full Impact 2.0, Get FullWrite Professional 1.5 FREE!
  - Buy FullWrite Professional 1.5, Get Full Impact 2.0 FREE!

Now you can produce volumes of your most creative work on budget and on time. Scan in photos up to 4K by 4K then adjust brightness, contrast, and color balance. Wet paint and pressure sensitive brushes deliver superb artistic control. Use the sophisticated 8-bit masking feature for complex designs and illustrations. Create using PANTONE® colors or output 4-color separations on your 8-bit or 24-bit system. Even add in a sound track using the included slideshow. $469.

Buy PixelPaint Professional 2.0 now and receive an upgrade to 2.0 for FREE!

**Guarantee**

Many of our products come with a thirty day money back guarantee. If you are not completely satisfied, ask for details when you place your order.
Version 4.0, the very latest edition of Steven Bobker's Power User's Tool Kit is available now. Eight great programs on one handy disk. There's Tidy-Up! - a great utility to tidy your System Folder and Disk Doubler Expand - to extend all those compressed files.

The POWER USER'S TOOL KIT 4.0 is FREE from MacWAREHOUSE when you order from us. If you want the disk, you pay only $1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee ($10-$35). Many are absolutely free. All of the details are explained on the disk, which is yours to keep.

FREE CATALOG!
We carry more than 1,200 Macintosh products, including all the latest releases and new versions. We pride ourselves on getting new products first. If you can't find what you need, just fill in the information requested below and we'll start your free, one-year subscription to the MacWAREHOUSE catalog.

Timbuktu 3.1 (Farallon)
Timbuktu links all the Macs on a LocalTalk network (with password protection). Open and close files and actually operate the software on another Mac. Especially good for training unfamiliar applications, Timbuktu enables you to send files to others or let them copy to and from yours. Turns any application into a team activity. Open a document on your screen and you can share it with other users on your network. Operates file servers - from the comfort of your own Mac. (networking)

MacInTax 1990
MacInTax 1990 guides you through the process of preparing your Federal or State taxes. Just type in the requested numbers and MacInTax does the rest. When finished, just print the completed return on your LaserWriter or ImageWriter. If you used MacInTax in a previous year, 1990 will read those files and bring forward relevant items, saving time and reducing errors. Send in your MacInTax registration card and Softview will send you information about their annual updates. (accounting)

Freedom of Press 3.0
Now output to non-PostScript devices from applications such as PageMaker, Illustrator or QuarkXPress. Freedom of Press Light supports such printers as the HP LaserJet II, IIP, III, DeskWriter and PaintJet as well as all Apple, GCC or HP QuickDraw printers. Includes 17 scalable, rotatable PostScript fonts and support for additional fonts including Adobe Type I. Compatible with all Macs. $36.

Freedom of Press 3.0
Includes 35 fonts, supports more than 50 black and white and color printers. (utilities) $255.

MacWAREHOUSE
1-800-255-6227
(1-800-ALL-MACS)
Inquiries: 908-367-0440
FAX: 908-905-9279
Call 24 hours a day, seven days a week.
NEW! Express Customer Service Number:
1-800-445-9677
*Midnight Express service available weekdays.

I'm Kerry, call me at:
FROM MacWAREHOUSE

DATABASE SOFTWARE

<table>
<thead>
<tr>
<th>Acus 4th Dimension 2.0</th>
<th>489</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Fossil</td>
<td>249</td>
</tr>
<tr>
<td>AEC Management Systems AEC Information Manager</td>
<td>409</td>
</tr>
<tr>
<td>Ashton-Tate</td>
<td></td>
</tr>
<tr>
<td>gBase Mac Special 49</td>
<td></td>
</tr>
<tr>
<td>Full Impact</td>
<td>149</td>
</tr>
<tr>
<td>Claris FileMaker Pro New 218</td>
<td></td>
</tr>
<tr>
<td>Fox Software</td>
<td>282</td>
</tr>
<tr>
<td>FoxBASE+/Mac 2.0</td>
<td></td>
</tr>
<tr>
<td>Preferred Publishers</td>
<td></td>
</tr>
<tr>
<td>DBase 1.5</td>
<td>68</td>
</tr>
</tbody>
</table>

DESKTOP PUBLISHING

| Aldus DesignTeam       | 889 |
| PageMaker 4.0          | 499 |
| PrePrint               | 329 |
| LetraSet               |     |
| LetraStudio            | 275 |
| OLUDAI                 |     |
| Read-It 2.1 (OCR)      | 276 |
| Read-It Personal 2.0   | 139 |
| Quark                   |     |
| XPress 3.0             | 529 |
| TimeWarp               |     |
| Publish-It Easy        | 113 |

DRIVE DISKS/BOARDS

| Aura Systems Scoozy Graph | 729 |

ResumExpert (A Lasting Impression)

Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of 1989. See line listings for all 10 editions. (business) $49. each

Power User™

20 Meg Drive     329
30 Meg Drive     369
45 Meg Drive     419
60 Meg Drive     469
80 Meg Drive     519
44 Meg Removable Drive 689
RaiserOps RaiserOps Colorboard 264 689

Macintosh SE/Plus/Extended Keyboard Carrying Case (Targus) $26.95

ColorSnap-32+ (Computer Friend)

Real-time 24-bit color image capture for your Mac. Take input from video cameras, VCRs, laserdisks or even the latest still video cameras from Cannon and Sony. View live video on screen and capture the image with a mouseclick. Save in PICT or TIF format. Accepts composite, S-Video or RGB input. Free image database software included. Also includes Free Image Modifiers to capture directly in Adobe Photoshop. Let's Get Studio or QuarkXPress. (graphics) $649.

EDUCATIONAL/PERSONAL

Beacon Technology GEMS of the Word | 25 |
HyperBible International Version | 175 |
HyperBible King James Version | 145 |
BrightStar Alphabet Blocks 1.0 | 30 |
Taking Titles | 26 |
Broderbund The Playroom | 29 |
Davidson Math Blaster or Speed Reader | 29 |
Educorp Lingui-ROM | 279 |
Electronic Arts World Atlas | 68 |
Help Software Desktop Helper for Excel | 52 |
HyperGlo Software Company Chinese, German or Spanish Pronunciation Tutor+word | ea. 35 |
Italian or Russian Word Torture | ea. 29 |
Learn to Speak French | 159 |
Learning Company Mac Rabbi or Reader Rabbi 2.0 ea. 30 |
Micro Maps Map Art PICT or EPS ea. 99 |
Map Art PAINT ea. 41 |
Nordic Software (full line available) MacKids Preschool Pack 35 |
Penton Overseas Vocabulary Learn 2.0, French, German, Italian, Russian, or Hebrew ea. 35 |
Voice & Video Instruction Videos MacKid Preschool 3.0, Works 2.0, or Word 4.0 ea. 52 |
Voice & Video Instruction Videos HyperCard or PageMaker 4.0, Illustrator 85, PageMaker 4.0, or Persuasion 2.0, Quark 3.0, QuarkXPress 4.0 (graphics) ea. 35 |

ProModem 9600

The Only V.32 Data modem with fax capability both at 9600 BPS. Supports MNP 4 and V.42 error correction/MNP-5 data compression. Compatable with Mac with MacKNOWLEDGE (TM) communications software. MacDisk, a fax software program, plus a Mac cable. $699.

EQUIPMENT

P-51 Mustang Flight Simulator
Fly WWII'S best fighter plane. The P-51 Mustang. Dogfight German Me 109s, strafe ground targets, buzz the Eiffel Tower. Fly with or against another connected Mac. Watch action from 13 different camera angles. You can even see a replay of the last few minutes action. P-51 IS NOW IN COLOR! $35.

Empower I & Empower II
Empower I is a "front line" security software system that controls and monitors use of the Mac. Empower II also provides resource access controls at the folder level and multi-user privileges for increased security. Both products are easy to use and install. Each feature access logging, controls for disabling floppy drives and hard disk operations. Empower I $89. Empower II $155.

ProModem 9600
The Only V.32 Data modem with fax capability both at 9600 BPS. Supports MNP 4 and V.42 error correction/MNP-5 data compression. Compatable with Mac with MacKNOWLEDGE (TM) communications software. MacDisk, a fax software program, plus a Mac cable. $699.

DATABASE SOFTWARE

<table>
<thead>
<tr>
<th>Acus 4th Dimension 2.0</th>
<th>489</th>
</tr>
</thead>
<tbody>
<tr>
<td>File Fossil</td>
<td>249</td>
</tr>
<tr>
<td>AEC Management Systems AEC Information Manager</td>
<td>409</td>
</tr>
<tr>
<td>Ashton-Tate</td>
<td></td>
</tr>
<tr>
<td>gBase Mac Special 49</td>
<td></td>
</tr>
<tr>
<td>Full Impact</td>
<td>149</td>
</tr>
<tr>
<td>Claris FileMaker Pro New 218</td>
<td></td>
</tr>
<tr>
<td>Fox Software</td>
<td>282</td>
</tr>
<tr>
<td>FoxBASE+/Mac 2.0</td>
<td></td>
</tr>
<tr>
<td>Preferred Publishers</td>
<td></td>
</tr>
<tr>
<td>DBase 1.5</td>
<td>68</td>
</tr>
</tbody>
</table>

DESKTOP PUBLISHING

| Aldus DesignTeam       | 889 |
| PageMaker 4.0          | 499 |
| PrePrint               | 329 |
| LetraSet               |     |
| LetraStudio            | 275 |
| OLUDAI                 |     |
| Read-It 2.1 (OCR)      | 276 |
| Read-It Personal 2.0   | 139 |
| Quark                   |     |
| XPress 3.0             | 529 |
| TimeWarp               |     |
| Publish-It Easy        | 113 |

DRIVE DISKS/BOARDS

| Aura Systems Scoozy Graph | 729 |

ResumExpert (A Lasting Impression)

Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of 1989. See line listings for all 10 editions. (business) $49. each

Power User™

20 Meg Drive     329
30 Meg Drive     369
45 Meg Drive     419
60 Meg Drive     469
80 Meg Drive     519
44 Meg Removable Drive 689
RaiserOps RaiserOps Colorboard 264 689

Macintosh SE/Plus/Extended Keyboard Carrying Case (Targus) $26.95

ColorSnap-32+ (Computer Friend)

Real-time 24-bit color image capture for your Mac. Take input from video cameras, VCRs, laserdisks or even the latest still video cameras from Cannon and Sony. View live video on screen and capture the image with a mouseclick. Save in PICT or TIF format. Accepts composite, S-Video or RGB input. Free image database software included. Also includes Free Image Modifiers to capture directly in Adobe Photoshop. Let's Get Studio or QuarkXPress. (graphics) $649.

EDUCATIONAL/PERSONAL

Beacon Technology GEMS of the Word | 25 |
HyperBible International Version | 175 |
HyperBible King James Version | 145 |
BrightStar Alphabet Blocks 1.0 | 30 |
Taking Titles | 26 |
Broderbund The Playroom | 29 |
Davidson Math Blaster or Speed Reader | 29 |
Educorp Lingui-ROM | 279 |
Electronic Arts World Atlas | 68 |
Help Software Desktop Helper for Excel | 52 |
HyperGlo Software Company Chinese, German or Spanish Pronunciation Tutor+word | ea. 35 |
Italian or Russian Word Torture | ea. 29 |
Learn to Speak French | 159 |
Learning Company Mac Rabbi or Reader Rabbi 2.0 ea. 30 |
Micro Maps Map Art PICT or EPS ea. 99 |
Map Art PAINT ea. 41 |
Nordic Software (full line available) MacKids Preschool Pack 35 |
Penton Overseas Vocabulary Learn 2.0, French, German, Italian, Russian, or Hebrew ea. 35 |
Voice & Video Instruction Videos MacKid Preschool 3.0, Works 2.0, or Word 4.0 ea. 52 |
Voice & Video Instruction Videos HyperCard or PageMaker 4.0, Illustrator 85, PageMaker 4.0, or Persuasion 2.0, Quark 3.0, QuarkXPress 4.0 (graphics) ea. 35 |

ProModem 9600
The Only V.32 Data modem with fax capability both at 9600 BPS. Supports MNP 4 and V.42 error correction/MNP-5 data compression. Compatable with Mac with MacKNOWLEDGE (TM) communications software. MacDisk, a fax software program, plus a Mac cable. $699.
MacModem V.32 uses MNP Oass 9 technology for superior throughput up to 38,400 bps even over noisy telephone circuits. The result is high speed, error-free data transfer for reliable cost-saving data communications. Compatible with CCITT V.32, V.22, Bell 212A and 103 modulation standards as well as the Hayes™ AT command set. Includes Carbon Copy Mac Twin-Pac and Quick Link II. (modems). $689.

MacPrint 1.2

MacPrint 1.2 lets you print Mac documents on your HP LaserJet or LaserJet BD printer. It handles all the HP internal and cartridge fonts, and prints the others as bitmaps. You can mix low-res graphics and high-res text on the same page. Cable included. Does not support PostScript. $95.

Microphone II 3.0

The ideal communication software for international telecommunications. Packed for its ease of use and advanced scripting language. Microphone II now supports the hot new ZMODEM transfer protocol and can operate modern at any speed from 50 to 57,600 baud. $215.

Synchronicity 2.5

Creative decision-making and intuition-support program that serves as a relaxing way to take a break. Beautiful graphics and profound feedback help you master questions of personal strategy. Regular use will improve sense of timing while reducing stress and worry. $40.
### OVERNIGHT DELIVERY
ONLY $3.00
details below!

---

### THINK C

**MacPro Keyboard** .......................... 118.

**Koa Ia**

**MacVision 3.0** .......................... 299.

**Kraft**

**ADB Joystick Premium III (SE/II)**

**Special** .......................... 29.

**Lyntix**

**Lynx Turbo Trackball** .......................... 59.

**MicroSpeed**

**MacTrac ADB** .......................... 62.

**Micro Touch**

**The UnMouse** .......................... 159.

**Mouse Systems**

**Trackball ADB** .......................... 69.

**Little Mouse** .......................... 75.

**Practical Solutions**

**Mouse Master** .......................... 39.

---

### LANGUAGES

**Digital Ink, Inc.**

**Smalltalk/V MAC** .......................... 125.

**Symantec**

**THINK C 4.0 or Pascal** .......................... ea. 165.

**THINK C 4.0 (Symantec Corporation)**

**THINK C** integrates the editor, linker, and compiler to form a complete C language development environment. Version 4.0 now supports Object-Oriented Programming (OOP), with a number of compiler enhancements and a full C Class Library. It provides full source level debugging and the compiler produces tight, highly-optimized code. $185.

**THINK Pascal 3.0**

Full Pascal implementation with all the features needed to write applications on modern Macs. Optimizes 32-bit clean code. Supports Object Pascal, DXX, and DXXI and 68881 and 68020 co-processor. Uses MPW object files without conversion. Makes programming precise and easy. (language) $165.

---

### UTILITIES

**Screen shot 1.2 (Preferred Publishers)**

Screen Shot 1.2 offers fast, effective screen capture for Mac users. All features are in one movable window for maximal utilization. Simply drag Screenshot into the system folder, restart the Mac, and click the user-definable key combination. Once activated, click the appropriate function to capture any screen, window or menu. Then press the pop-up menu, choose to print or to save in the Clipboard, Scrapbook, PICT, Paint or StartupScreen. Added features include conversion from color to black & white and the ability to custom name the Screenshot file, plus much more. (utilities) $31.

---

### SECURITY & VIRUS PROTECTION

**ASD Software, Inc.**

**FileGuard 2.5** .......................... 139.

**FileGuard Office 5-pack** .......................... 349.

**FileGuard Office 10-pack** .......................... 579.

**Fifth Generation**

**Disk Lock** .......................... 118.

**Kensington**

**Pass Protect** .......................... 69.

**Kent Marsh**

**MacSafe II** .......................... 107.

**NightWatch** .......................... 86.

**Microcom**

**Virex** .......................... 59.

**Virex 10 pack** .......................... 329.

**Symantec Corporation**

**S.A.M.** .......................... 67.

**TACTILE SOFTWARE**

**Sound Clips** Vol. 1, 2, 3, or 4 .......................... ea. 49.

---

### MUSIC AND SOUND

**Altach**

**MIDI Interface** .......................... 59.

**Coda**

**MacDrums** .......................... 31.

**Midiplus**

**Deluxe Music Construction 2.5** .......................... 85.

**Deluxe Recorder** .......................... 99.

**Farallion**

**MacRecording 2.0f** (records sound) 159.

**Tactic Software**

**Sound Clips Vol. 1, 2, 3, or 4** .......................... ea. 49.

---

### OVERNIGHT DELIVERY
ONLY $3.00
details below!

---

### THINK C

**MacPro Keyboard** .......................... 118.

**Koa Ia**

**MacVision 3.0** .......................... 299.

**Kraft**

**ADB Joystick Premium III (SE/II)**

**Special** .......................... 29.

**Lyntix**

**Lynx Turbo Trackball** .......................... 59.

**MicroSpeed**

**MacTrac ADB** .......................... 62.

**Micro Touch**

**The UnMouse** .......................... 159.

**Mouse Systems**

**Trackball ADB** .......................... 69.

**Little Mouse** .......................... 75.

**Practical Solutions**

**Mouse Master** .......................... 39.

---

### LANGUAGES

**Digital Ink, Inc.**

**Smalltalk/V MAC** .......................... 125.

**Symantec**

**THINK C 4.0 or Pascal** .......................... ea. 165.

**THINK C 4.0 (Symantec Corporation)**

**THINK C** integrates the editor, linker, and compiler to form a complete C language development environment. Version 4.0 now supports Object-Oriented Programming (OOP), with a number of compiler enhancements and a full C Class Library. It provides full source level debugging and the compiler produces tight, highly-optimized code. $185.

**THINK Pascal 3.0**

Full Pascal implementation with all the features needed to write applications on modern Macs. Optimizes 32-bit clean code. Supports Object Pascal, DXX, and DXXI and 68881 and 68020 co-processor. Uses MPW object files without conversion. Makes programming precise and easy. (language) $165.

---

### UTILITIES

**Screen shot 1.2 (Preferred Publishers)**

Screen Shot 1.2 offers fast, effective screen capture for Mac users. All features are in one movable window for maximal utilization. Simply drag Screenshot into the system folder, restart the Mac, and click the user-definable key combination. Once activated, click the appropriate function to capture any screen, window or menu. Then press the pop-up menu, choose to print or to save in the Clipboard, Scrapbook, PICT, Paint or StartupScreen. Added features include conversion from color to black & white and the ability to custom name the Screenshot file, plus much more. (utilities) $31.

---

### OVERNIGHT DELIVERY
ONLY $3.00
details below!

---

### THINK C

**MacPro Keyboard** .......................... 118.

**Koa Ia**

**MacVision 3.0** .......................... 299.

**Kraft**

**ADB Joystick Premium III (SE/II)**

**Special** .......................... 29.

**Lyntix**

**Lynx Turbo Trackball** .......................... 59.

**MicroSpeed**

**MacTrac ADB** .......................... 62.

**Micro Touch**

**The UnMouse** .......................... 159.

**Mouse Systems**

**Trackball ADB** .......................... 69.

**Little Mouse** .......................... 75.

**Practical Solutions**

**Mouse Master** .......................... 39.

---

### LANGUAGES

**Digital Ink, Inc.**

**Smalltalk/V MAC** .......................... 125.

**Symantec**

**THINK C 4.0 or Pascal** .......................... ea. 165.

**THINK C 4.0 (Symantec Corporation)**

**THINK C** integrates the editor, linker, and compiler to form a complete C language development environment. Version 4.0 now supports Object-Oriented Programming (OOP), with a number of compiler enhancements and a full C Class Library. It provides full source level debugging and the compiler produces tight, highly-optimized code. $185.

**THINK Pascal 3.0**

Full Pascal implementation with all the features needed to write applications on modern Macs. Optimizes 32-bit clean code. Supports Object Pascal, DXX, and DXXI and 68881 and 68020 co-processor. Uses MPW object files without conversion. Makes programming precise and easy. (language) $165.

---

### UTILITIES

**Screen shot 1.2 (Preferred Publishers)**

Screen Shot 1.2 offers fast, effective screen capture for Mac users. All features are in one movable window for maximal utilization. Simply drag Screenshot into the system folder, restart the Mac, and click the user-definable key combination. Once activated, click the appropriate function to capture any screen, window or menu. Then press the pop-up menu, choose to print or to save in the Clipboard, Scrapbook, PICT, Paint or StartupScreen. Added features include conversion from color to black & white and the ability to custom name the Screenshot file, plus much more. (utilities) $31.

---

### OVERNIGHT DELIVERY
ONLY $3.00
details below!

---

### THINK C

**MacPro Keyboard** .......................... 118.

**Koa Ia**

**MacVision 3.0** .......................... 299.

**Kraft**

**ADB Joystick Premium III (SE/II)**

**Special** .......................... 29.

**Lyntix**

**Lynx Turbo Trackball** .......................... 59.

**MicroSpeed**

**MacTrac ADB** .......................... 62.

**Micro Touch**

**The UnMouse** .......................... 159.

**Mouse Systems**

**Trackball ADB** .......................... 69.

**Little Mouse** .......................... 75.

**Practical Solutions**

**Mouse Master** .......................... 39.

---

### LANGUAGES

**Digital Ink, Inc.**

**Smalltalk/V MAC** .......................... 125.

**Symantec**

**THINK C 4.0 or Pascal** .......................... ea. 165.

**THINK C 4.0 (Symantec Corporation)**

**THINK C** integrates the editor, linker, and compiler to form a complete C language development environment. Version 4.0 now supports Object-Oriented Programming (OOP), with a number of compiler enhancements and a full C Class Library. It provides full source level debugging and the compiler produces tight, highly-optimized code. $185.

**THINK Pascal 3.0**

Full Pascal implementation with all the features needed to write applications on modern Macs. Optimizes 32-bit clean code. Supports Object Pascal, DXX, and DXXI and 68881 and 68020 co-processor. Uses MPW object files without conversion. Makes programming precise and easy. (language) $165.

---

### UTILITIES

**Screen shot 1.2 (Preferred Publishers)**

Screen Shot 1.2 offers fast, effective screen capture for Mac users. All features are in one movable window for maximal utilization. Simply drag Screenshot into the system folder, restart the Mac, and click the user-definable key combination. Once activated, click the appropriate function to capture any screen, window or menu. Then press the pop-up menu, choose to print or to save in the Clipboard, Scrapbook, PICT, Paint or StartupScreen. Added features include conversion from color to black & white and the ability to custom name the Screenshot file, plus much more. (utilities) $31.
For your money. Key tronic's new ADB-compatible 102-key MacPro features an enlarged shaped Return key for faster, more accurate data entry. Dual-legend keycap assures ease of operation in both Macintosh and MS-DOS environments. Includes a FREE copy of the award winning macro package Tempo II. Backed by a three year manufacturer warranty. (in-put(out) $118.

**ALSoft**

DiskExpress II 2.04 .......................... 57.
Master Juggler ................................ 64.
American Power Conversion
Power Chute .................................... 69.
Berkeley System
After Dark 2.0 .................................. 24.
CE Software
Alarming Events ................................ 85.
QuickKeys 2.0 .................................. 97.
Caire
OmniDraft ...................................... 69.
OmniPage 2.1 ................................... 539.

**WORD PROCESSORS/ SPELLING CHECKERS**

**Ashton Tate**

FullWrite Professional 1.5 .................. Special 149.
Claris
MacWrite II ..................................... 142.

**Planisoft (ASD Software)**

Planisoft increases workplace productivity through detailed management of time and resources. Use its intuitive user interface and powerful relational database to simultaneously manage and record activity concerning hundreds of people, events, materials and locations. Juggie multiple work group agendas and instantly recall your contacts and related data for a given period of time. Also tracks time spent on a particular account by individual employees. Everything is kept confidential through multi-level password protection. (business). $139. Office 5 pack $579. Office 10 pack $839.

**Deneba Software**

BigThesaurus .................................... 64.
Spelling Coach Pro 3.1 ........................ 124.

**Lexpertise**

MacProof 3.2 .................................. 115.
LifeTree
Correct Grammar ................................ 49.
Microlytics
Word Finder 2.0 ................................ 34.

**Microsoft**

Word 4.0 ........................................ 245.
Preferred Publishers
Vantage 1.5 ..................................... 52.
RightSoft
RightWriter for the Mac ........................ 55.

**Tactil**

MagicTypist .................................... 49.

**TAoK**

WriteNow 2.2 ................................... Special 119.
WordPerfect Corp.
WordPerfect ..................................... Call.

**POWER USER**

**Power User** 2400 baud Modem
Install a new Power User 2400 baud modem and log on to CompuServe or any of the exciting on-line services! This new, full-featured modem comes complete with everything you need to start communicating. It's easy to install and ready to use - all cables and MAC-compatible 9600 bps data modems included. It also has all the features you need in a modem, including Auto Answer, Auto Dial and Advanced Diagnostics for error checking. Only $99.

Power User 2496 Mini Send Fax
New! Send important documents to destination fax machines with the Mini Send Fax. Mini Send Fax combines the technologies of the Power User 2400 bps data modem and an internationally compatible 9600 bps Group III fax. Requires Hard Drive. Just $149.

I'm Donna, call me at

**MacWAREHOUSE**

1-800-255-6227

Inquiries: 908-367-0440

FAX: 908-905-9279

ORDER TOLL-FREE

24 HOURS A DAY.

NEW! Express Customer Service Number:

1-800-445-9677
The World's Fastest Optical System!
The Canon MO by MicroNet.

MicroNet is proud to offer the fastest rewritable optical disk system available. The difference is clear with the new Canon MO. Unlike other systems it spins at 3,000 rpm, achieving sustained reads of 675 KiloBytes per second. This is greater than double the rate of other systems.

A great deal of attention has been paid to reliability. As a result the Canon MO has become a reality far in advance of its time. The subsystem has been designed to work perfectly under various operating conditions, employing a unique air flow and dust filtration system.

The optical disks can be safely stored for many years or locked away for security.

MicroNet supports auto-lock and eject to ensure data integrity. Our device drivers are maintained by our engineers to be fully compatible with Apple's latest System and we support any Macintosh with a SCSI port.

Our optical systems are ideal for publishing and sound applications, since storing or transporting of large files is safe, easy and cost effective.

MicroNet is noted for superior quality and excellent technical support. When it's all said and done, MicroNet's optical storage products are simply the finest that money can buy.

For more information and the location of an Authorized MicroNet Dealer in your area, call our sales department at 1-714-837-6033.

"Quality You Can Count On"

MicroNet Technology, Inc.
20 MASON • IRVINE, CALIFORNIA • TEL: (714) 837-6033 • FAX: (714) 837-1164

Please circle 136 on reader service card.
In the not-too-distant future, you may be able to move page-layout documents among rival programs and platforms. A consortium spearheaded by Quark and Atex is developing the Publishers Interchange Language (PIL), which conveys information about page geometry and content via ASCII files. This means, for example, you could create a document in PageMaker on an IBM PC and then open it in the Mac version of QuarkXPress. The initial release is scheduled for summer 1991.

By Aileen Abernathy

Whether TrueType? Apple and Adobe have finally kissed and made up, announcing a new licensing agreement and cooperation on future products. What does this mean for TrueType and TrueImage, the Apple/Microsoft alternatives to PostScript technology? Apple’s TrueType outline-font technology probably won’t be merged with Adobe’s Type 1 format, at least not right away. Linotype, Bitstream, Monotype, and Agfa Compugraphic are still developing TrueType fonts, which should be released when System 7.0 ships in 1991. But Apple and Adobe will probably make every effort to ensure compatibility between the two technologies. This includes PostScript support in new Apple printers and TrueType compatibility in PostScript output devices and future versions of Adobe Type Manager. Microsoft is proceeding with its TrueImage PostScript clone, despite overwhelming consumer interest. The first TrueImage printers, from Microtek and LaserMAX, should ship in early 1991.

Expanding Quark: Hard on the heels of its success with QuarkXPress 3.0, Quark is squeezing its reputation as a one-product, one-platform company. The company will release OS/2, Windows 3.0, and NeXT versions of QuarkXPress in 1991. And despite the failure of QuarkStyle (remember it?), Quark is again trying to broaden its product line, this time with QuarkLibraries, a series of EPS clip-art packages designed to work with QuarkXPress 3.0’s library feature.

Poster-sized prints: The largest image created on the Mac (that I know of) is an 18-x-32-foot poster produced with PosterWorks (S.H. Pierce & Co.). Version 2.0 of PosterWorks lets users assemble photographic-quality color images containing multiple text and graphic elements and then send tiled output to any PostScript device. PosterWorks offers excellent control over color separations, and the output is impressive (see photo). For those who’d rather print their oversized art on a single sheet, the MegaChrome printing service can output color images of up to 42 inches by 12 feet in size. Developed by ReproCAD, MegaChrome is currently available at service bureaus in six cities. The 400-dpi EPS output can be produced in just a few hours and is perfect for maps, banners, signs, posters, and advertising comps. Cost is $12 per square foot; to find out the location of the nearest shop, call ReproCAD at (415) 284-0400.

Resources: Verbum magazine now has a series of instructional books that showcase the work of top designers and illustrators. The topics: PostScript illustration, page design, painting, typography, and scanned imagery (M&T Books, $29.95 each).
New Ventura Publisher for Macintosh. It flies through long documents.

Eliminate wandering graphics. They stay linked to the right passage even when you add, delete or move text.

Automatic forward and backward cross-referencing, table of contents and indexing.

Vertical justification ensures that all text and graphics line up top and bottom.

The more you have to do, the more you need Ventura.

If you’re working on long documents with anything less than Ventura Publisher* you’re working too hard. Our new Macintosh Edition lets you fly through books thousands of pages long. As well as one page newsletters.

It has the power, automation, and advanced features that made Ventura first choice of PC publishers. But we’ve redesigned it with the look, feel, and point-and-click simplicity that has made Macintosh your choice. Stop wasting your time. See your dealer and learn how Ventura Publisher makes short work of long documents. Or call (800) 822-8221.*

Ventura Software Inc. A Xerox Company

*In Canada call (800) 228-8579. Ventura Publisher* is a trademark of Ventura Software Inc., a Xerox company. XEROX is a trademark of XEROX CORPORATION. All other product names or trademarks are property of their respective owners. © 1990, Ventura Software Inc.

Please circle 169 on reader service card.
Beyond the Laser Printer

An imagesetter does more than make your publications look professional. Understanding how this high-end printer works can save you time and tribulation, not to mention money.

By Kathleen Tinkel

What on earth is there to know about imagesetters? They're just fancy printers that put a little more WYG into your WYSI, right?

Not exactly. If we call anything that produces paper or film from the Mac a printer, then an imagesetter is a printer—but what a printer! With its superior output and lofty price tag, this high-end machine is the Ferrari of electronic publishing. Imagesetters initially made PostScript irresistible to the publishing world. Then the PostScript/imagesetter duo redefined the typographer's job, and now it's on the threshold of doing the same for graphic designers, strippers, and other prepress professionals.

Imagesetter prices are dropping, quality is improving, and the variety of brands and models is growing at a healthy rate. We've come a long way since 1986, when the term imagesetter was so firmly attached to the Linotronic 100 and 300 that we were "going to Lino" when we sent a file for high-resolution output. Today Agfa Compugraphic is pressing hard on Linotype's heels, and other companies are jockeying close behind. Every wave of new machines brings more speed, higher resolution, and even better technical quality.

Unless you're a printing or prepress professional, you probably won't be buying an imagesetter any time soon. Even if you can justify the initial expense—which starts at around $30,000 and counts up by tens of thousands—running your own imaging system is unlikely to make you more productive. You're better off taking high-resolution work to service bureaus and letting them, not you or your employees, maintain the imagesetter's chemistry and supplies and train the master of all trades—stripper, printer, graphic artist, PostScript maven, computer whiz—who can get high-quality output out of these machines day in and day out. Then you won't have to troubleshoot the problems that crop up with every new customer and every minor software upgrade—problems that can easily turn a planned profit center into a dead loss.

Even as a service-bureau customer, however, you should learn something about how imagesetters work. Knowing what's possible (and what's not) will help you prepare files that print reliably. You'll have more control over the output and save time and money.

The Imagesetter Advantage

The imagesetter makes professional-caliber output available to anyone who can create a page on a computer. It can't magically turn you into a graphic designer or copywriter, of course, but your brochures, business forms, newsletters, and other work will look more professional if you output the camera-ready artwork on an imagesetter instead of on a
The human eye stops discerning stair-stepping (a.k.a. the jaggies) in type and line art. At 1,200 dpi, most type is rendered well, although some typefaces with fine lines, tiny serifs, or subtle flares really require 2,400 dpi or more. The highest resolutions — 2,400, 3,000, and beyond — are most useful for typefaces with fine details; posters or other art that will be photographically enlarged; and jobs with screened solids, halftones, or separated full-color images — and then only when they are printed to standards that can exploit all of this detail (see the
Please circle 131 on reader service card.

Need artwork with a professional touch?

ProArt Professional Art Library™—nine collections of incredibly useful art images available on floppy disk or compact disc in Mac or PC format.

★★★★★ —Macworld

In search of a way to organize artwork?

Multi-Ad Search™—an innovative new image cataloging and retrieval system designed especially for the professional production environment.

NEW PRODUCT!

Want to create exceptional layouts?

Multi-Ad Creator™—a revolutionary ad makeup program that features free rotation of graphics and text, copyfitting, advanced object drawing and manipulation, and more.

Call 1-800-447-1950, ext. 300

Please circle 378 on reader service card.
Color-matching on the Macintosh® used to be a hit-or-miss affair. Not any more, thanks to SuperMatch, the professional color matching system from SuperMac™. It was developed in partnership with Tektronix®, a company with longstanding expertise in developing high-end color solutions.


SuperMatch does much more than color calibrate your monitor. It allows you to match all the colors across your entire system—those you scan and display as well as those you print.

The reason: TekColor™ enables SuperMatch to ensure optimum levels of color fidelity. In other words, think of it as WYSIWYG for color.

Now, what you see on the screen is what others will see in color prints, 35mm slides and overhead transparencies. And you don’t waste time tweaking colors to get the desired output—or make costly test runs. That’s because SuperMatch always delivers a precise match between on-screen and printed color.

And this doesn’t only apply to spot color. SuperMatch utilizes the TekColor system to provide continuous color matching, so that photos and detailed illustrations can always be matched perfectly. No matter what the job, you get professional results every time.
SuperMatch

An Open System Keeps Your Options Open.

SuperMatch is unique in that it's an open color matching system, supported by all the leading color scanner and printer vendors. Which means it works with virtually any Macintosh II color peripheral you might use. And because it's completely transparent to your software, SuperMatch works with any application.

Not only that, but the SuperMatch Display Calibrator makes it possible for the same type of monitors to show documents exactly the same way. So you can divide up a large design project among several locations—and not worry about varying color quality.

SuperMatch even gives you the flexibility to simulate the final viewing environment, create images under fluorescent light and preview them under daylight or other conditions.

If You're A Perfectionist With Color...

You owe it to yourself to discover the ultimate color matching system. SuperMatch—with TekColor—is nothing short of revolutionary, delivering color fidelity across a range of Macintosh peripherals in a way that's never been possible. Until now.

To find the SuperMac dealer nearest you, call 1-800-624-8999, Ext. 210

(c) 1990 SuperMac Technology, all rights reserved. SuperMac and SuperMatch are trademarks of SuperMac Technology. Macintosh is a registered trademark of Apple Computer, Inc. All other brand names are registered trademarks of their respective holders.

Please circle 60 on reader service card.
"Understanding Resolution" sidebar).

**More Control.** Your Mac software gives you control over the page and graphic images, of course, but much of what you create may be lost at low resolutions. If you want to screen type or add screened panels that print behind type, for example, you're almost compelled to spring for an imagesetter job.

**Better Time Management.** By sending documents to a service bureau for output, you get them out of the way earlier in the production cycle. Your staff can focus on what it does best and leave the sometimes arcane process of producing PostScript output to specialists.

**Accuracy.** Accuracy is especially important any time one page has to match another — if you're bleeding graphics across a spread, for example. It's essential if you're doing color work, which requires precise image registration. The output from imagesetters is more stable than that of laser printers, for two reasons. First, photographic material — both RC (resin-coated) paper and film — is physically more stable than even the fanciest paper used in laser printers. It doesn't stretch as much while moving through the machine, it doesn't have to withstand the high temperatures that a laser printer puts out (which can also distort paper), and it's less likely to stretch and shrink with varying humidity. Second, the transport mechanism in imagesetters is designed to move paper and film more smoothly and precisely than that of laser printers, so that problems such as distorted type or graphics, banding, and misregistration are less likely.

**Economy.** A somewhat obscure advantage of the imagesetter's higher resolution (1,200 or so is sufficient) is that you can print small type and fine-lined artwork without sacrificing readability. Nine-point type fills in and becomes unreadable when printed at 300 dpi on a laser printer, but it is sharp and legible at 1,270 dpi on an imagesetter. For price lists, timetables, and other reference materials, this may save several pages — and it will almost certainly save you more than the relatively modest cost of high-resolution output.

---

**Choosing a Service Bureau**

By asking a few questions about its equipment and the services it offers, you can assess a service bureau's capabilities and expertise. Here are some suggested questions (and answers) to help you choose the best shop for your imagesetter work. (If you need a bureau for film output and/or color separations, see the questions in "Getting It on Film," May '90, page 351.)

**Which Mac operating system are you using?**

A well-run service bureau should have a full understanding of the Mac's operating system; its graphics file formats and foibles; and font management, with the attendant pitfalls (and solutions). At this writing, the answer should be System 6.04 and Laser Prep 6.01.

**What kind of Mac setup do you have?**

An output service doesn't have to have the latest Mac model, but you should be alarmed if it doesn't use at least a Mac II, because the shop presumably needs access to color and lots of memory.

---

**The simplest way to get a MacIntosh into your Mac.**
How new is your imagesetter?

Again, it's not necessary to have the newest and fastest imagesetting equipment for most routine work, but a place with outdated units is at a disadvantage. A good service bureau is likely to have a Linotronic 300 with a RIP 3, or an Agfa ProSet 9400 with a Max RIP. Anything older is likely to have imaging problems.

Can you output files from the four basic Mac graphics programs: PageMaker, QuarkXPress, Illustrator, and FreeHand?

Operators don’t have to know all the tips and tricks, but they should have the most current versions (or subversions) of each program and know how to control details such as crop marks and the line frequency for screened work. They should also know when to use PrePrint, Separator, and other necessary programs.

What fonts do you have? Can you provide screen fonts for the typefaces in your library?

Most large service bureaus get the Adobe/Linotype fonts as they’re issued and probably also have fonts from other vendors (Monotype, Bitstream, and The Font Company are the most common sources). If you are a regular customer with a healthy amount of output, most good service bureaus will buy the fonts you use if they don’t already have them (but not for your first drop-in job).

How well do you know PostScript?

At the very least, an operator should be able to read PostScript well enough to do basic troubleshooting of jobs that are reluctant to print. It’s an even better sign if the operator can write short PostScript routines to make up for software inadequacies.

Do you use a densitometer? How often?

A densitometer is an optical device that produces density readings from film. The service bureau should use it daily to check emulsion quality, particularly for halftone and color jobs. This is the only way to ensure the accuracy and consistency of grays and colors.

Do you offer film output on a regular basis?

Even if you don’t send your output to film, this is a good question. One sign of a service bureau’s excellence is its handling of film work, because film is used for more-demanding jobs (such as halftones and color work) and requires greater expertise. Also ask how often the shop processes film. Some service bureaus economize on processing equipment by outputting film only occasionally—say, one day a week. You’re out of luck if you need film any other day. Occasional film output also suggests that the bureau doesn’t do demanding work on a regular basis and may not be keeping up with changes in software and technology.

Do you guard against viruses?

Good hygiene is essential. The service bureau should check its equipment for viruses every day (with the latest version of an antiviral program) and have an isolated Mac for checking customer files before allowing them onto the network.

What’s your procedure for accepting work?

The best service bureaus have an organized procedure for taking in work, such as a form that asks you to list all the necessary details of your job.

The simplest way to get an image into your Mac is Canon’s new FV-540, the world’s first combined video floppy disk drive and digitizer.

It’s simplest because it works more easily: Using an RC-470 or any other still video camera, capture an image on a 2-inch video floppy disk. Then the FV-540’s combined 5V Scan” software lets you pull up onto your screen a visual directory of up to 50 images at once. Just click your mouse to select the image you want.

And it’s simplest because it connects more easily: It uses the SCSI interface that lets you plug directly into your Mac. What’s more, its 24-bit, full-color digitizer gives you the highest possible resolution from any still video source.

Yet the FV-540 is priced sensibly enough to please even a frugal Scotsman.

In sum, Canon’s new FV-540 makes still video quite simple. For more facts, Mac, call 1-800-221-3333, ext. 313.

Canon


Enjoy easy extended payments with the Canon Circle Card. Ask for details at participating Canon dealers and retailers. Available only in the U.S.

Please circle 412 on reader service card.
A new way of looking at modems

TELEPORT, the MNPS modem designed for your Macintosh and you.

Fast, reliable connections. TELEPORT's MNPS data compression passes your data faster than generic 2400 baud modems, while error correction protects you from telephone line noise. Put FAX on your menu. Now TELEPORT can fax your documents at 4800 baud as easily and quickly as you print. With the optional TELEPORT/FAX software ($60), TELEPORT is the convenient way to send faxes, even to multiple destinations, while you use your Macintosh for other purposes.

Best of all, yours for only $149.95. Call us today at 1-800-736-4821. Take advantage of our introductory price of $149.95, a $75 discount off our $225 suggested retail price. We'll also include America Online and CompuServe new member kits. Your purchase is protected by a 30 day unconditional return option and a 5 year warranty. Discover what a Macintosh modem was meant to be.

Global Village
Communication
Menlo Park, California
+1-206-6700

What Is an Imagesetter, Anyway?

An imagesetter is a high-resolution output device that uses a laser beam to "paint" text and graphics onto photosensitive paper or film. The basic machinery consists of a PostScript RIP, or raster image processor (which can be software but is more often a piece of hardware), and the imagesetter itself, sometimes called a recorder or writing engine. The RIP translates the incoming PostScript file (usually sent from a Mac) into the pattern of dots that will be output. The recorder's laser beam then traces the image onto paper or film. (RC paper is generally used if the output is type and line art; transparent film is preferable for halftones and color work.) The exposed paper/film is then developed in a film processor to produce the finished page.

Imagesetters come in two basic formats. In the conventional two-box system — such as most models sold by Linotype and Agfa Compugraphic — the RIP and recorder are separate entities. The buyer chooses a RIP and a compatible recorder from a single manufacturer's line, generally paying more for faster RIPs and for recorders with higher resolution. There are also imagesetters, such as those in the BirmySetter line, that combine both recorder and RIP in a single box. In the past, these stand-alone models were slower, less precise, and less expensive than the two-box systems, and they were mainly used for outputting type and line art in low-volume settings such as design studios and ad agencies. However, now you can get more-capable stand-alone units, such as the Optronics ColorSetter 2000.

Working with Service Bureaus

As recently as 1988, sending files out for high-resolution output could be quite daunting, an adventure only for the very bold. But yesterday's problems — font-ID conflicts, slow imagesetters with insufficient memory, software whose files took hours to image (or, as with CricketDraw, wouldn't image at all), and
service bureaus staffed by novice operators — have given way to technological advances and greater competence, even professionalism. Imagesetting hardware is much more powerful, and page-layout and graphics software works (for the most part) smoothly and capably. Today when you have problems with a font, bump into software or imagesetter limitations, or make a technical error, a good service-bureau operator will know how to output the job anyway, without much loss of time or great expense.

Whichever imagesetter a service bureau uses, the most important element to a customer will always be the operator. If you have specific technical requirements — for wider-than-normal pages, closely registered colors, or ultrahigh resolution — then, of course, you’ll have to locate a service bureau that can provide those features. In most cases, however, your goal should be to find a place staffed by competent people you can work with, people who can help you learn to manage the technology (see the “Choosing a Service Bureau” sidebar).

At a recent symposium of output experts — people who manage the service bureaus that have been producing desktop color — a surprising fact emerged. The operators consider it part of their job to teach customers how to use the software and understand the technology. It’s not altruism — the service bureaus will be much more efficient if they’re not always recovering from the same errors. This also suggests an important consideration for users to keep in mind: If a service-bureau operator is going to be your teacher, make certain you find one who has something useful to teach you.

What about price? Although there is competition among service bureaus, be skeptical of places that offer drastic discounts for their output services — they may not have modern, well-maintained equipment or skilled personnel. Quality costs, and a service bureau must pay for its pricey equipment (which must be replaced when it becomes technically obsolete), maintenance and repairs, supplies such as film and chemicals, highly skilled labor, and waste disposal. A growing number of service bureaus charge by the running inch instead of the page, because imagesetters can produce odd-sized output, making the notion of “standard” pages obsolete. Today’s imagesetters are faster and more capable, so you rarely run into time charges for slow-running graphics files unless you’re outputting color separations or doing other processor-intensive work.

If you can’t find a service bureau nearby that can handle your job, it’s fairly easy to work with a remote bureau, and in some cases it may even be preferable. Regional and national service bureaus are appearing, in part because some work (especially color) demands a level of expertise that’s not available in every metropolitan area. Sending your output to remote service bureaus is relatively easy, thanks to fax machines, fast modems (9,600 bps is becoming commonplace), portable high-density storage media such as the ubiquitous SyQuest drives, and reliable overnight-delivery services. Using a remote service bureau may even be less expensive than using a local bureau — current overnight- or two-day-express services...
SMART WORD PROCESSING!

EASY-TO-USE
A great word processor is more than just a stockpile of features—it’s the usability of those features when doing real work! WriteNow actually delivers usability—and our awards and ratings prove it.

FAST ON ANY MAC!
WriteNow is the undisputed performance champion. Editing, searching, spell checking, saving, and printing happen lightning fast. For big and small documents. On any Macintosh. With or without a hard drive.

SMART WORD PROCESSING
WriteNow now includes the new Grammatik 2.0 grammar checker, making WriteNow the smartest choice in Macintosh word processing!

The imagesetter makes professional-caliber output available to anyone who can create a page on a computer.

Imagesetter Models
To give you a better understanding of imagesetters and their features, here’s a brief look at the models you’re most likely to encounter in a service bureau.

Linotype. Three years ago, there were two imagesetters on the market: the Linotronic 100 and 300, both from Linotype. Linotype has long since discontinued the L100, which was slow, was limited to 1,270-dpi resolution, and had so little memory that many files simply wouldn’t print. (Linotype replaced the L100 with another low-end model, the L200, which is somewhat faster and has a maximum resolution of 1,693 dpi.) However, you can still find L100 machines in use, particularly in in-house typesetting facilities and at quick-print shops that do a little output on the side. Steer clear of these clunkers; because they’re so inefficient to operate, you may, ironically, end up paying a premium, and they don’t produce high-quality work.

The L300 is another story. Most service bureaus that use Linotronics are operating L300s, probably with a RIP 3 or the faster RIP 4. This workhorse unit offers a 2,540-dpi resolution and has the speed and quality to do almost any work that fits on a 12-inch-wide page. In fact, the L300 is being used by some skilled PostScript mavens to produce color separations, although that’s stretching its capabilities a bit. In 1990, Linotype introduced an imagesetter optimized for color work, the L330, and the very fast RIP 30. The L330, which supports resolutions of up to 3,386 dpi, can be found in a few high-end color shops. Linotype also has two wide-paper models, the Linotronic 500 and 530, which can image 18-inch material.

Agfa Compugraphic. A year or two ago, Compugraphic sidled into the marketplace; by mid-1990 it seemed to be

Please circle 87 on reader service card.
LISTEN, MAC, YA GOT THREE CHOICES...

LaserMAX 1000
Personal Typesetter

The LaserMAX 1000 utilizes the same revolutionary TurboRes™ technology to produce incredible 1000 x 1000 TurboRes™ output. TurboRes™ resolution enhancement technology controls the position and height of the pixels on the printed page and eliminates coarse steps between pixels, otherwise known as jaggies. With output this sharp, you won't need to send out for expensive and time-consuming typeset output.

And, both the LaserMAX 1200 and the LaserMAX 1000 come standard with the LaserMAX 135 Typeface Classics—135 premium typefaces in Type 1 format.

LaserMAX 400
Personal Printer

Who said quality doesn't come cheap? The LaserMAX 400 provides Macintosh users with 400 x 400 TurboRes™ output, 50 premium typefaces in Type 1 format and still sells for less than $2,000. That's a bargain any way you look at it.

The LaserMAX 400 is a powerful PostScript-language compatible laser printer that works with many of your desktop publishing and graphics applications. The 4-page-per-minute printer is based on the same LBP-LX print engine that's used with other personal printers, including Apple's new Personal LaserWriter SC and NT and HP's LaserJet 11P.

If you're looking for an extraordinary resolution solution, call LaserMAX today: (612) 944-9696, Dept. 181.

LaserMAX 1200
Personal Typesetter II

You knew it was only a matter of time before LaserMAX gave you more. With the introduction of the LaserMAX 1200, Macintosh users are given far more publishing power than ever: 1200 x 1200 TurboRes™ output in an 11 x 17-inch format.

At 1200 x 1200 TurboRes™ the LaserMAX 1200 provides you with text that's crisp and accurate—even delicate serifs are reproduced with amazing precision.

And the large format gives you the freedom to create two-page spreads and print the entire image as camera-ready art without having to shrink or tile. You can also place crop marks and bleeds, print CAD designs, newsletters and posters in an 11 x 17-inch format.

© 1990 LaserMAX Systems

TurboRes™ is a trademark and patent-pending technology of LaserMAX Systems. Macintosh, TrueType and AppleTalk are registered trademarks of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems, Inc. TrueImage is a registered trademark of Microsoft Corporation. The AppleTalk™ protocols and computer programs are licensed from Apple Computer, Inc.
prepress

outselling Linotype on a month-to-month basis. The Agfa Compugraphic line of ProSet imagesetters offers excellent quality, high speed, and a slightly wider page than usual (13.3 inches). The company offers modular units; a buyer chooses one of the ProSet recorders, the 9400 or the 9800, with either a PS Max RIP or the new high-performance PS Max Plus RIP. Agfa also offers the SelectSet 5000, which is designed specifically for high-end color work. It incorporates Adobe’s speedy Emerald RIP, which is based on a RISC processor and can print tabloid-sized pages. In addition, Agfa has a new low-end model, the compact and relatively inexpensive StudioSet 2000.

Varityper. Although its imagesetters seem to be selling slowly, Varityper offers an unusual feature of interest to service bureaus: a memory buffer that enables its 5300, 5330, and 5500 models to re-image a page without running it through the RIP again. The 5500 model is limited to 1,016 dpi but accepts material up to 18 inches wide; the 5300 model goes up to 2,400 dpi and the 5330 machine to 3,048 dpi.

Other Vendors. Several other companies— including Birmy, ECRM, Hell, Hyphen, Monotype, and Optronics—also market imagesetters. You may not find these machines at service bureaus, but if you’re considering buying an in-house system, they’re good candidates.

Birmy Graphics sells several models of its modestly priced BirmySetter. Birmy’s older PostScript-clone units, based on the UltraSetter recorder, were reliable workhorses for type and line work. Its newer models have a faster Adobe PostScript RIP. BirmySetters offer resolutions of up to 3,000 dpi; the newest model, the 350Z, is based on the Holotek recorder and offers software-selectable resolutions of up to 4,000 dpi. Birmy also plans to market an imagesetter that uses Adobe’s superfast Emerald RIP.

Monotype seems to be focusing primarily on the newspaper market with its fast, 1,200-dpi ExpressMaster 1200, which can handle 18-inch material. The company also offers a standalone unit, the Prism PS Plus, for black-and-white work and has announced an Adobe Emerald-based RIP, the PS4000.

The Optronics ColorSetter 2000 has a non-Adobe RISC-based RIP and produces resolutions of up to 2,000 dpi on 20-inch-wide material. Optimized for color work, the ColorSetter can be slow and cumbersome but is very accurate.

Hell, which supplies its UltraSetter recorder to several other vendors, has recently introduced Bridglit, its own Ultra-based stand-alone imagesetter. Bridglit is targeted at design studios, ad agencies, and other low-volume black-and-white sites.

Plain-Paper Imagesetters. Finally, there are several plain-paper “imagesetters” on the market. These are essentially laser printers with resolutions of 600 dpi or higher. This particular category is getting crowded— vendors see an opportunity to upgrade office laser

Strong Medicine.

"Outstanding Product! Effectively disinfected my system of 19 viruses - no more print problems or bombs - Thanks!"
Costa Mesa, CA

Today’s computer virus problems require strong medicine. They require Virex. Virex is a comprehensive solution to the threat of Macintosh computer viruses. Virex both detects and repairs files infected by all known viruses, and continuously monitors your Macintosh to prevent new infection. Its powerful Record/Scan feature enables you to detect previously unknown viruses. All this in an easy-to-use product that is backed by the industry’s best support and service. Call us for the name of the dealer nearest you or for information about site licensing.

Microcom Software Division
P.O. Box 51816
Durham, NC 27717
(919) 490-1277 ext. 615

© 1990 Microcom, Inc. Virex and Virex Help Hotline are trademarks of Microcom Systems, Inc. Macintosh is a trademark of Apple Computer, Inc.

Please circle 118 on reader service card.
printers to near-typeset-quality output—but for the most part, you probably won’t find these printers at service bureaus. Most of the major vendors (Linotype and VariType, for example) offer a plain-paper model, as do several other companies. LaserMAX sells the LaserMAX 1000 Personal Typesetter, which provides 1,000-dpi resolution, as well as a controller board that can convert an Apple LaserWriter to 800 dpi. Printware markets a 1,200-dpi laser printer, the 720 IQ.

Although the cited resolutions of plain-paper machines seem comparable to those of film-producing imagesetters, they are actually visibly coarser. This is due in large part to the nature of toner. It’s hard to control precisely where toner falls and how large the dots become when the toner is heat-fused (that is, melted) to the paper. Plain paper is also less stable than photographic media, so registration and page-matching are difficult. Finally, some of the PostScript-clone models—such as the LaserMAX—have compatibility problems with Type 1 fonts or with the Mac itself.

Special Needs

If your work involves many halftones, complex EPS graphics, or full-color images, you should look for a service bureau with newer, faster, more powerful equipment. This can include Linotype imagesetters with model numbers ending in 30 (the L330 or L530, especially) operated with the fast RIP 30, or an Agfa ProSet imagesetter with the PS Max Plus RIP. Systems that use Adobe’s new Emerald RIP should also offer the required power.

If you need to output color separations, the Linotron 330, the Agfa SelectSet 5000 or ProSet 9800, and the Optronics ColorSetter 2000 are designed specifically for this purpose. For large newspaper- or poster-sized pages, locate a service bureau that offers output on 15-, 18-, or 20-inch-wide media. Either of the Monotype ExpressMaster imagesetters will fill the bill (although they’re rarely found in service bureaus), as will the Linotronic 530, Agfa SelectSet 5000, VariType 5500, Optronics ColorSetter 2000, or a Hyphen system based on the ECRM PelBox 108s recorder.

Finally, for high-quality output of delicate or subtle typefaces such as Optima, especially at sizes below 6 points, look for an imagesetter with ultrahigh resolution (3,000 dpi or more). The Linotron 300, Varityper 5330, BirmySetter 300 or 350 (the latter is not yet shipping), and Hyphen UltereSetter-based models all offer these high resolutions.

Imagesetters are becoming more capable with every new product release from Adobe and the hardware vendors. In fact, they’re almost keeping pace with graphics and page-layout software and our expanding appetite for imaging power. Even if you don’t intend to buy one of these amazing machines, to know them is to make the most of them in your attempts to produce complex graphics and color work from the desktop.

---

**FILE AND DISK RECOVERY TOOLS**

**MICROCOM 911 UTILITIES**

The Microcom 911 Utilities is a collection of award-winning file and disk recovery tools for the Macintosh. The 911 Utilities combines an extensive Troubleshooting Guide with a lineup of powerful utility programs. The Troubleshooting Guide leads the user, quickly and easily, through the steps necessary to solve a wide range of problems. The 911 Utilities includes these programs:

- **1st Aid** recovers data from damaged disks and files.
- **Complete Undelete** tracks and recovers deleted files.
- **Virex** detects and repairs files infected by known viruses.
- **Sector Collector** isolates bad disk sectors to protect valuable data.

**Great Support Too!** A comprehensive recovery product requires more than just award-winning software. Microcom provides its 911 Help Hotline™ so users can get help fast. Be prepared for the inevitable, see your favorite dealer for the Microcom 911 Utilities.

---

Microcom
P.O. Box 51489
Durham, NC 27717
(919) 498-1277, ext. 921

© 1990 Microcom Systems, Inc. Microcom 911 Utilities, 1st Aid, Complete Undelete and Sector Collector are trademarks and View is a registered trademark of Microcom Systems, Inc. Macintosh is a trademark of Apple Computer, Inc.

Please circle 123 on reader service card.
STEP BY STEP

Complex Graphics

You can greatly simplify the creation of a complex graphic by using multiple drawing layers.

By the editors of Verbum magazine

A sophisticated graphic may have numerous elements: backgrounds, objects, shadows, masks, text, and so forth. This complexity can make it hard to work with selected elements, can lengthen screen redraw times, and can create output problems. You should be able to minimize these frustrations by using a program that provides multiple drawing layers.

At the Los Angeles Times, illustrator Juan Thomassie relies on FreeHand's layering function to produce detailed infographics quickly and accurately. Assigning graphic elements to their own layers helps manage the object order (which elements are in front, which in back) and lets elements be worked on independently. Each layer (or range of layers) can be made active (editable) or inactive. Inactive layers are invisible, which eliminates selection and redraw hassles. Using layers also may help documents print faster and with fewer PostScript errors. Other programs that let you use layers — such as Canvas, SuperPaint, Dreams, and MacDraw — offer similar functionality.

Illustrator Juan Thomassie used FreeHand's layers to simplify the creation of this complex but coherent infographic, which appeared in the Los Angeles Times on August 14, 1990.
Creating the Map

A basic world map is hand-traced from a reference atlas, scanned, and opened in FreeHand as a template. The outlines of continents and islands are drawn as closed shapes and assigned to layers 20 (Western Hemisphere) and 22 (Eastern). The interior borders are drawn as open-ended lines and assigned to layers 24 (Eastern) and 26 (Western). This organization makes it easy to select and color different elements.

Adding Depth and Color

With FreeHand's Layer Control, layers 20 through 22 are made active. The continent and island shapes in these layers are selected and colored with a light-gray fill and no outline. The resulting gray shapes are cloned and filled with blue, offset a few points to the bottom, and sent to layer 16 to create drop shadows. Next, layers 24 and 26 are selected, and the interior-border lines are styled as 0.5-point blue lines.

Creating a Background

The ocean area, which serves as a unifying background for the graphic, is composed of three separate filled areas: a center rectangle filled with solid blue, a top rectangle with a logarithmic fill graduating from blue up to white, and a bottom rectangle that changes from blue to white in a linear gradation. A logarithmic fill produces a more rapid fade than does a linear fill, and thus it provides a larger area of white at the top of the background to set off the black headline. The rectangles are styled with no outline so that the colors blend seamlessly where the top and bottom gradations touch the solid fill. Then they are sent to layers 5 through 7, near the bottom of the layer hierarchy.

Highlighting a Region

The world map is too coarse to be used for details, so a separate map of the Persian Gulf is hand-traced, scanned, auto-traced, and finally pasted into layers 38 through 58 of the original map document. To highlight Saudi Arabia, its borders are drawn as a single closed shape and colored with a radial fill. A multipointed arrow placed in layer 40 slips between the inset's ocean background and the land areas. Drop shadows are added to the arrow and country shapes with the technique described in Figure 3.
ROSES ARE X=0.7344, Y=0.2656;
VIOLETS ARE X=0.1566, Y=0.0177.

Owing to variations in human perception, color, like beauty, is very much in the eye of the beholder. This being true, if we want to communicate accurately about color, we need to convert the language of art into something considerably more objective and exact: the language of science.

Some time ago, an international scientific team developed a mathematically reliable color system, known as CIE. This model is the basis for the new RasterOps® True Color Calibrator Display System™.

Due to temperature, humidity, and as yet-imperfect CRT technology, even the best and brightest display colors...
can drift and fade over time. To compensate, the True Color Calibrator display has a built-in microprocessor which monitors performance on a continual basis and corrects instabilities with its own internal calibration routines.

This self-calibration is performed automatically, 75 times a second — well before the sharpest eyes would detect any variation in color. The net result is that roses and violets on a True Color Calibrator display will always remain true to their mathematically-defined color values. Whether three minutes, three days, or three months from now. And the system has a communication port which can send these scientifically precise formulas to other monitors and printers.

The True Color Calibrator also comes with an Optisense® optical sensor which, used just once a month, adjusts the system’s self-calibration scheme for the inevitable aging of screen phosphors.

The makers of other calibration systems may make a big to-do about the optical sensor they provide. This is understandable, since that’s all they provide. With no microprocessor in their display, they cannot offer automatic, continual calibration. The moment you remove the sensor, colors begin to drift and fade all over again. Which means their system is only as accurate as the number of times per day you stop and use the sensor. What’s more, they recommend that calibration be performed only while in the more limited 8-bit mode.

In deciding which calibration solution is in fact the most effective, it might be helpful to know that the world’s most sophisticated electronic pre-press systems use the same microprocessor-controlled calibration we do. And further, that MacUser has hailed the RasterOps True Color Calibrator as “the most sophisticated monitor ever built”.

If your application calls for a truly stable and precise color environment, your best call would be to a RasterOps dealer. Or you can phone 800.468.7600 to find out more about the True Color Calibrator from RasterOps. The people who’ve got the art of color down to a science.
Finally there is NuPORT. A NuBus, SCSI-2, synchronous, DMA, host adapter, that is fully compatible with the Macintosh II family.

Each NuPORT host adapter adds a brand new SCSI port that is three times as fast as the native SCSI port. To ensure performance, MicroNet sells matched hard disk drives capable of synchronous transfers from 2.1 to 3.7 MBytes per second. Their capacities range from 300 to 2,000 MBytes with average access time as fast as 5.4 ms.

Matched NuPORT hard disk drive systems are excellent for all disk intensive applications. They are especially suited for sound, graphics, multi-media, publishing, pre-press, CAD/CAM, and EtherTalk file servers.

For more information and the location of an Authorized MicroNet Reseller in your area, call our sales department at 1-714-837-6033.

### COMPARISON OF SIMILAR PRODUCTS

<table>
<thead>
<tr>
<th>Feature</th>
<th>NuPORT</th>
<th>PowerCard</th>
<th>ProntoCard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to Duplicate 200 MBytes</td>
<td>3:39</td>
<td>9:30</td>
<td>9:58</td>
</tr>
<tr>
<td>Time to Load a 30 MB Color File</td>
<td>0:11</td>
<td>0:33</td>
<td>0:37</td>
</tr>
<tr>
<td>Suggested Retail Price</td>
<td>$600</td>
<td>$1295</td>
<td>$1495</td>
</tr>
<tr>
<td>True NuBus Bootable Device</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multiple Macintosh Support</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supports SCSI-1 and 16 Bit SCSI</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Synchronous Data Transfers</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supports Transfers to 4.4 MBytes/s</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Includes Hard Disk Utility Software</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>On-Board DMA Support</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Shipped With a Matched Hard Disk</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>System 7.0 Compatible</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>A/UX 2.0 Hard Disk Partitioning</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supports Spliced/Overlapped Seeks</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supports Synchronized Spindles</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*Additional cost when added with specific MicroNet hard disk subsystems.

NuPORT is Sold Only With Matched Hard Disk Drives.

Quality is Not Expensive, It's Priceless.

MicroNet Technology, Inc.

20 MASON • IRVINE, CALIFORNIA • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppletLink: D1656 • Compuserve: 76004,1611

Please circle 137 on reader service card.
Mac users want file servers to look and act like AppleShare servers. Data shared by UNIX workstations are typically stored on NFS (Network File System) servers. NFS servers don’t behave like AppleShare servers. But now, with Wollongong’s new PathWay Client NFS for Macintosh, they do. With the Client NFS INIT in your System Folder, NFS servers appear in the Chooser and mount on the desktop just as any other AppleShare server does. $195 per node; bulk discounts available.

By Henry Bortman

Incoming in box: Nearly two years after acquiring the InBox electronic-mail system from Symantec, Sitka (formerly TOPS (formerly Sun (formerly TOPS))) has reshaped the product into the most flexible cross-platform mail solution available today’s desktop market. By the time you read this, InBox will be the only electronic-mail application that not only provides client software for both Mac and PC users but also allows users to install and administer an E-mail server on either a Mac or a PC. Remote access and send-and-receive fax capability will be included as part of the InBox 3.0 package. Gateways to other mail systems (VMSmail, X.400, SMTP, and MHS — but not QuickMail and Microsoft Mail) will be available from third parties.

Sun also rises: A SPARCstation running NeWSprint software can turn a serially connected printer into a network device. NeWSprint uses the computing power of the SPARC CPU to image PostScript-based documents faster, Sun claims, than the controllers in most of today’s dedicated PostScript printers. Sun is also offering a SPARCprinter, a 300-to-400-dpi 12-page-per-minute laser printer. But, like Freedom of Press on the Mac (see review, January ’90, page 77), NeWSprint works with printers from a dozen leading printer vendors, including Canon, HP, and Epson.

Interpersonal computing: Buzzword for the 90s? Xerox is buzzing about GlobalView, a networked multitasking environment with an emphasis on sharable documents that reside on servers. Innovative features include a “portable desktop” — you log on to the network from any participating workstation, and up pops your own personal desktop, complete with unanswered E-mail. Xerox previously offered GlobalView only on its proprietary 6085 and 8010 workstations. Now it’s ported the software to a SPARCstation-IPC-based workstation, the Xerox 6520 (the software does run on other SPARCstations). And Xerox has put its 6085 CPU on a coprocessor card that runs alongside OS/2 in an Intel machine, turning it into a GlobalView workstation. Keep an eye on this. The engineers at Xerox PARC know what they’re doing, even if their marketing department doesn’t.

Who says DOS can’t be fun? Microsoft is shipping — ready? — an Entertainment Pack for Windows. Seven games, $39.95. “Although the primary benefit [sic]… of the Entertainment Pack is fun, it can also help new Windows users get comfortable with the Windows environment.” Is it that uncomfortable?
MacLinkPlus/PC transfers and translates in both directions between a Macintosh and a PC, Sun or NeXT machine for more than 175 combinations of popular programs, including word processors, spreadsheets, databases, and graphics. The product comes complete with everything you'll need... software for both machines, built-in communications to work with the included cable or your modems, and our complete library of translators.

Please circle 147 on reader service card.

If you're already using your server, network, or DOS drive to access PC files, then you can simply purchase MacLinkPlus/Translators. It's the same product without the cable and communications software.

Graduate to MacLinkPlus. It's the only smart thing to do.

For more information, call DataViz at (203) 268-0030.

DataViz. The Industry Leader in File Translation.

All product names are trademarks of their manufacturers.
Network by Design

Many Mac networks are plug and play, but efficient ones are planned.

By Kurt VanderSluis

If that's the case for you as a network manager, it's time to build a drawing board and create a design. Besides being a reference point for your network, a design is a convenient way to communicate to others — wiring technicians, users, managers, assistants, and vendor's tech-support people — what you're

Figure 1: When designing a network, three areas must be considered to prevent confusion later. Ignoring them can lead to confusion after the network is set up.
Put some “Multi” in your Finder!

One could have expected something called “MultiFinder” to find things in multiple ways. After all, using conventional card catalogs, public libraries have always offered multiple ways to locate documents (by author, title, or subject).

But that’s not what MultiFinder is about, and it’s too bad because there just isn’t a single right way to arrange files on a hard disk.

With an elegant twist on the folder metaphor, KiwiFINDER empowers your Macintosh with a more flexible filing system.

At your request, KiwiFINDER can create the illusion that your hard disk is organized in any of seven different ways, so you can always get an angle on your data.

One click of the mouse and all your files are organized by file type, with all your MacPaint documents in the same folder. Another click, and your files are organized by date, with all your Nov'90 files neatly tucked in a folder by that name.

There never is a single way to look at a situation. So, put some “Multi” in your Finder.

KiwiFINDER Extender is an integrated INITand application system which provides radically improved file browsing, searching, and organizing from all “Open” and “Save” dialog boxes.

One disk organization modes by name, file type, file creator, creation date, modification date, folder, and keyword.

4 sort modes

Multiple criteria searches

File cross-indexing using keywords

File notes right from “Save” dialog.

And much, much more...

KiwiFINDER Extender is $99.95

KiwiFINDER Extender is a hard disk organization and file management tool.

Try KiwiFINDER FREE for 60 days!

I want to try KiwiFINDER on Kiwi's 60-day guarantee. If I am not satisfied, I may return it within 60 days for a full refund. KiwiFINDER is $89.95 + $3.20 shipping and handling. CA residents add $6.75 tax.

Call 800-321-8742 dept. K

Or send check and copy of this ad to:
KiwiSOFTWARE, Inc.
6546 Pardall Road, Santa Barbara CA 93117

Please circle 397 on reader service card.

KiwiFINDER Extender is a hard disk organization and file management tool.
When it comes to Ethernet, only Asanté has all the right connections.

If you haven't yet heard of the new 10BaseT Ethernet™ technology, you've come to the right place. Because there is no better place to learn about the latest in technological advances than from the leader in Macintosh® networking, Asanté Technologies.

The Ins and Outs Of 10BaseT.

10BaseT was recently adopted by the IEEE as a new standard for running high speed Ethernet over unshielded twisted-pair telephone wire. It can often be installed right over your existing telephone lines, keeping installation costs well below both thick and thin Ethernet, yet operating at the same 10Mb per second speed.

With a 10BaseT network, you can link all your Macs, PCs and any other workstations with a 10BaseT card to a central hub in a star configuration. It's easy to add or remove nodes, and isolate problems. If one computer goes down, the others stay up and running.

The Best Of 10BaseT, From Asanté.

As the leader in Macintosh technology, you can count on Asanté™ to have the fullest line of 10BaseT products available. Only Asanté offers interface cards for the Macintosh SE, SE/30 and Mac II family of computers to keep you well connected in a variety of ways.

The Asanté 10T Hub™ is built for maximum flexibility. Shipped with interchangeable back panels, you can connect up to 12 Macs using either RJ-45 jacks or a 50-pin connector that plugs directly into your telephone system. It has ports for both thick and thin Ethernet cabling. And a series of LEDs to help you determine link status, auto-partitioning, network traffic and transmission jams, as well as achieve peace of mind.

And with the Asanté 10T MAU™ transceiver, you can plug your PCs or other computers with thick Ethernet cards into your 10BaseT Macintosh network, and answer all of your needs.

We Keep Our Reputation By Keeping Ahead Of The Times.

Asanté earned its reputation as the leader in Macintosh networking by creating the fastest, most reliable Ethernet cards available. As new Macs are introduced, Asanté will keep that reputation with the highest performance, lowest cost networking solutions.

Asanté is dedicated to offering the best in Macintosh networking technology. And committed to providing you with all the right connections. All the time.

©1990 Asanté Technologies, Inc. All brand names and products are trademarks or registered trademarks of their respective holders.
Guide to the Print Dialog Box

As printing from a Macintosh has grown increasingly complicated, so have the Print dialog boxes that applications present to users. Here's how to handle almost any option a dialog box might throw at you.

By Craig Danuloff

Apple's standard Print dialog box hasn't changed much over the past few years, making it unrepresentative of the Print dialog boxes in most of today's Mac applications. To show the many options you're likely to encounter in current Print dialog boxes, here's a fictional dialog box (see Figure 1). This fictional Print dialog box comprises a main dialog box and two subsidiary dialog boxes that you access through dialog-box buttons.

The dialog box documented here was created primarily as a demonstration tool, but it also illustrates the need for Apple to provide more printing options for Mac applications. In 1991 the output needs of Mac users are far more complex than they were in 1985, and yet the LaserWriter Print dialog box has hardly changed since its introduction. This has forced nearly every software developer to modify the Print dialog box, leaving Mac users to face a different dialog box in every application.

Although not every option in this sample Print dialog box is appropriate for every application, the need for a consistent interface does not necessarily need to bow to the lowest common denominator. The benefits of Print-dialog-box standardization might override the negative aspects of standardizing on a full-featured dialog box.

Copies: The Copies option lets you specify how many copies of each page (usually up to 999) you want to print. Although the basic use of this option is obvious, in most cases it's faster and cheaper to reproduce quantities greater than 10 by using a photocopy machine rather than your laser printer.

Collate: When you're printing more than one copy, the Collate option lets you specify whether the pages of each copy will be printed in order (1, 2, 3, 4, ... ) or if all copies of page 1 should be printed before all copies of page 2 and so on. Although choosing the Collate option saves you some manual effort, it forces your printer to image each page once for each printed copy, thereby substantially increasing the time it takes to complete the print job. For this reason, use the Collate option only when you're printing pages that don't contain any downloadable fonts or large graphics.

Page Range and Sections: Although the traditional Page Range option lets you specify printed pages by page number, the addition of the Sections option provides control of the increasing number of word processors and page-layout programs that support multiple sections within a single document.

Scaling: 100%

Fit on Paper

Manual

Auto 0.65 inches

Other 100%

Thumbnails 16 per page

OK

Cancel

Tile: Tiling lets you break pages that are larger than the current page size across multiple sheets of paper. You can then glue or tape these separate sheets together to create a full-sized image. There are two tiling modes: Manual and Auto. Manual tiling requires you to specify the break for each page by manipulating some type of page-break option on the electronic page. Auto-tiling eliminates this task, automatically breaking your page into segments that fit onto the current paper size.

100%, Fit on Paper, and Other: These options let you print the current file at its normal size (100 percent) or at any enlargement or reduction percentage from 25 percent to 999 percent. The Fit on Paper option automatically calculates the reduction needed to fit each page on one sheet of the current paper. It offers only automatic reductions, not automatic enlargements.

Thumbnails: The Thumbnails option produces pages containing miniature versions of several pages from your file on a single sheet of paper. This is useful for looking at the overall layout of your file, although it is also useful as a way to create a paper record of the contents of a file without keeping a complete printout. You specify how many miniature pages should be placed on each page. In some applications, the size of the miniature pages is determined by the number of pages that are put onto each piece of paper, whereas other applications use a single size for the reduced pages, regardless of how many are included.
Print Selection Only: The Print Selection Only option limits the printing to only the text and/or graphic elements that are selected (highlighted) when you choose the Print command. Although this option is becoming common in text-based applications, it is equally useful in graphic applications, where printing times are generally longer and so limiting the print range can produce faster output.

Print This File Only and Print All Related Files: The Print This File Only and Print All Related Files options recognize that an increasing number of Macintosh files are created as part of larger publications and that it is therefore convenient to have the option of either printing all related files together (all the chapters of a book, for example) or specifically limiting the printing to only the current file.

Print Blank Pages: The Print Blank Pages option solves a common problem by specifying that blank pages not be printed unless this option is selected.

Reverse Order: The Reverse Order option ensures that single or collated copies are placed in the correct page order on printers that normally stack pages with the last page first. Very few printers (the original LaserWriter is one) are designed this way, so most users rarely need this option.

Scaling options: Several options affect the size at which images or pages are printed. To access these Scaling options (see Figure 2) in our fictional dialog box, you would click on the Scaling button in the main Print dialog box.

Options options: A variety of options have become common in Print dialog boxes. These are included in the Options dialog box, which you access by clicking on the Options button in the main Print dialog box.

Manual Feed: On many laser printers, if you want to use the manual-feed paper tray, you must select the Manual Feed option in the Print dialog box. This isn't true of the Apple LaserWriter II printer, however, which automatically takes paper from the manual-feed tray if it's present. Using the Manual Feed option with LaserWriter II printers eliminates the need to race to the printer to put your letterhead into the manual-feed tray before paper from the normal tray is used — the LaserWriter II waits for you to place paper in the manual-feed tray.

Proof Print: In the course of creating any type of word-processing or page-layout file, you often print draft after draft in order to read the latest version of your document's text. In most cases, you don't review the graphics included in your files along with each draft — yet they account for most of the time these files take to print. By using the Proof Print option, you can replace the graphics in your draft prints with a simple box. When it's time for the final print, you simply deselect the Proof Print option and your graphics reappear at full resolution.
**Include Crop Marks:** When you select this option, a variety of markings appear in the area just outside your printed page. Standard crop marks are useful, because they let you accurately trim a page that is printed on a larger paper size. When you’re printing to other locations, most applications add several extra crop marks, including the name of each separation page, and registration marks.

**Smooth Bit Maps:** This option improves the resolution of 72-dpi bit-mapped images by algorithmically adding bits from the laser printer’s 300-dpi matrix to smooth out the rough edges that result from printing a 72-dpi image on a 300-dpi printer. This has no effect on EPS, PICT, or TIFF graphics or on PostScript or bit-mapped fonts.

**Download Prep Temporarily:** To print most PostScript files on PostScript printers, a dictionary file (such as LaserPrep or Aldus Prep) must first be downloaded to the printer to define shorthand comments in the PostScript file sent during printing. These prep files usually remain in the printer’s memory until you reboot the printer, so they do not permanently consume printer RAM.

**Print Hidden Text:** Hidden text, as supported in Microsoft Word, is a special text style that you can toggle on and off for both display and printing. In other applications, the equivalent of hidden text can be used as electronic notes and can be displayed or hidden, both on-screen and on paper. This option controls the inclusion of hidden text in printed files.

**Cover Page:** When you share a busy laser printer over an AppleTalk network, a confusing stack of pages can quickly build up in the printer’s output tray. Selecting the Cover Page option adds a page at the start or end of each print job, listing the Chooser name, publication title, and printing date and time for each job. Cover pages make it easy for output pages to be correctly distributed.

**Substitute Fonts:** When the LaserWriter was first introduced, many documents sent to the printer contained the basic nonlaser fonts New York, Geneva, and Monaco. To improve the quality at which these documents printed, Apple made it possible to substitute Times for New York, Helvetica for Geneva, and Courier for Monaco. This option is still available in many Print dialog boxes and still has the same effect. Unless the document being printed contains New York, Geneva, or Monaco, the Substitute Fonts option does nothing.

**Download Bit-Mapped Fonts and Download PostScript Fonts:** When you select the Download Bit-Mapped Fonts option, the Macintosh sends information to the printer to help it form characters for fonts that aren’t available in PostScript format. The alternative to downloading bit-mapped fonts is some sort of font substitution, in which Courier replaces the missing font. Because the character widths of the original font and its substitute are inevitably different, very poor printing results from such substitutions. In PageMaker, deselecting this option causes an error message to flash in the Print Status dialog box, which warns you that the document being printed contains bit-mapped fonts. Assuming you didn’t intend your file to contain bit-mapped fonts, you can then cancel printing and replace bit-mapped fonts with laser fonts.

When you select the Download PostScript Fonts option, the Macintosh downloads PostScript printer fonts from your System Folder to the PostScript printer if they aren’t already resident in the printer. If the fonts aren’t resident in the printer or your System Folder, bit-mapped versions of the PostScript screen fonts are used instead, resulting in extremely jagged output.

You should select this option only when you expect printer fonts to be downloaded from your System Folder.

---

**Diagram:**

- **Download bit-mapped fonts**
- **Download PostScript fonts**
- **Substitute fonts**
- **Include Crop Marks**
- **Smooth Bit Maps**
- **Download Prep Temporarily**
- **Print Hidden Text**
- **Cover Page:**
  - No
  - First
  - Last
- **Print PostScript to disk:**
  - File name...
  - Normal
  - EPS
  - For separations
  - Include Prep File

**Figure 3**

---

The ideal Print to Disk option would support the selective inclusion of prep files as well as downloadable fonts in the disk file and would support standard-text PostScript files, Encapsulated PostScript files (which include screen images and can be placed inside other documents), and PostScript files that include OPI comments (which can be used by high-end color-separation devices). In this implementation, the File Name button specifies the filename and location for the PostScript file that is created.

Even though most applications do not currently offer Print to Disk options, you can capture PostScript files to disk by pressing Command-K immediately after clicking on the OK button in any LaserWriter Print dialog box.
"Customer Service Is Our Most Important Product"

Whether you're a corporate buyer, the owner of a small business or a home user, you're important to us. We understand your needs. For example, we've collaborated with Federal Express to offer $2 overnight guaranteed delivery, because we know you “absolutely positively” need your order tomorrow. We want you to turn to MacAvenue for your hardware and software needs — with confidence that you'll get not only a great value, but also the kind of service that only a company with our background and experience can provide.

We design our own hardware — like the Protege hard drive — to be the best-engineered in the business. And we're just as committed to good service! If you have a problem with your Protege drive or any other product you buy from MacAvenue, give us a call and we'll send a replacement by Federal Express for next-day delivery. Our MacFax service gives you comprehensive product information by fax — and it's fast and free. And we've put together a leasing program so your company can keep up with the latest technology without breaking the budget.

You won't find a better value than MacAvenue.

Bill Hayden
CEO, MacAvenue/CompuAdd Corporation
MacAvenue: More Than A Source, A Resource...

Protégé — The Best Drive in the Business

Top-notch engineering makes the Protégé cool, quiet and reliable — the best hard drive for your Macintosh. With features like external termination, push-button SCSI address selector and Disk Master™ Disk Management Software, the Protégé is easy to operate. Bundled with OnLocation, the best file-finding utility — a $129.95 value — Free!

"MacAvenue's inexpensive 100MB Portable hard drive is far and away the best value for your mass storage dollar currently on the market." — Steven Baker, Mac User Columnist

100MB Protégé (Quantum) 24392 ......................... $695
MacAvenue Protégé Carrying Case 26908 ....................... $24

See listings below for more Protégé drives

---

Hardware

Storage Devices

Quantum
24399 40MB External Protégé ................ $455
24391 80MB External Protégé ................. $645
24392 120MB External Protégé ................ $695
24191 40MB Internal (5-channel) .......... $375
24188 80MB Internal (5-channel) ........ $375
24192 80MB Internal (5-channel) ........ $375
24193 103MB Internal (5-channel) .......... $445
24180 20MA Internal (5-channel) .......... $295
24185 40MB Internal ................. $325
24181 80MB Internal ................. $325
24182 103MB Internal (5-channel) .......... $445

Seagate
24380 20MA External Protégé ................ $475
24382 80MA External Protégé ................. $595
24184 20MA Internal (5-channel) .......... $295
24186 80MA Internal (5-channel) .......... $325
24185 40MA Internal ...................... $325
24181 80MA Internal ................. $325
24182 103MA Internal (5-channel) .......... $445

---

Printers, Scanners and FAXes

Complete PC
22752 Complete Halftone Scanner .... $315
22753 Complete Page Scanner .......... $378

Dell
22752 Personal Scan ................ $699

Dove
22701 Dovefax-External ................ $289

Epson
56339 Epson LX-2550 - 24 pin printer .......... $910
56340 Epson LX-2551 - 24 pin printer .......... $289
56343 Epson LX-810 - 9 pin printer ........ $185

Kodak
22883 M150 Mac Portable ................ $519

Logitech
22511 ScanMan 30 ......................... $319

MicroTek-IMSI
22715 Microtek 3002 Color Scanner .......... $1945
22716 Microtek M15II & B/W Scanner .......... $1800

Orchid
22702 OrchardFAX Modem ................. $149

Relays
22790 Texas RAX2110 ................. $895

Silo
22852 Label Printer ................ $195

Texas Instruments
22856 17 Foot microcable w/ AppleTalk .......... $1795
22851 55 Foot microcable w/ AppleTalk .......... $1995
22108 2nd Drawer feeder w/ UP Tray .......... $325
22106 Envelope Feeder (Gray) ................ $299
22107 Legal Paper Tray (Gray) ................ $59
38163 1MB Memory Upgrade ........... $295

Thunderware
22617 Lighting Scan 400 ................. $385

Communications-Modem

Applied Engineering
22306 DataLink Express ................ $169

---

NEW LOW PRICE! $54/Megabyte

Get the most processing power out of your Mac: build your four-slot SE to 4MB or your 8-slot Mac to 8MB. Only the best surface-mounted 80 nanosecond memory products. Call MacFax for pricing chart.

Technology Works 2x 1MB SIMM Kit ....... $80ns 25480 .......... $108
Technology Works 4x 1MB SIMM Kit ....... $80ns 25482 .......... $216

---

Technology Works
22519 Mac II Ether Kit ............... $725
22518 Mac II Ether Kit ............... $725
22517 Modem (US) ................ $395

---

Monitors and Video Cards

Micron
21544 Mac II 8086 1024X768 ........ $855
21543 Mac II 8086 640X480 ........ $345
21542 Mac II 8086 1024X768 ........ $855

Rastersons
22006 19" monitor w/ Color Board 208 .... $450
22010 Color Board 208 ................. $450
22031 Color Board 264 ................. $544
22039 ColorBoard 264/SE30 ........ $743
22040 ColorBoard 340 ................. $1790

---

Ethernet Connector for LocalTalk Printers

Dayna EtherPrint takes the place of expensive routers or bridges to connect your LocalTalk print to the Ethernet network. EtherPrint makes a simple "plug-and-print" connection with adaptors for any cable/printer combination.

EtherPrint (Dayna) 223541 ...................... $360

Silo
22602 14" Color RGB ................ $595
22601 20" Color RGB Color/w/o card .... $195

Silo/Rastersons
22005 14" w/ Color Board 208 .......... $900
22001 14" w/ ColorBoard 264 .......... $1119

Sigma Designs
22800 Colosum 19" monitor w/ card ........ $1999
22808 L-View Multi-Mode 19" w/ card .... $1499
22100 PageView 15" w/ Mac adapter ........ $1050
22103 PageView 15" w/ SE adapter .......... $1999
22106 PageView 15" SE/30 adapter .......... $1999
22104 SilverView 21" w/ Mac adapter ...... $1499
22107 SilverView 21" w/ SE adapter .......... $1999
22103 SilverView 21" w/ SE/30 adapter .......... $1999

---

Accelerator and Expansion Boards

Dayna
23632 030 256MB II w/ co 68862 .......... $1140
23644 030 256MB II w/ co 68862 .......... $1140
23633 030 386MB II w/ co 68862 .......... $1839
23631 030 386MB II w/ co 68862 .......... $1839
23639 030 500MB II w/ co 68862 .......... $2130
23647 030 500MB II w/ co 68862 .......... $2130
23634 100 Cache card ................ $289

Dove
23616 Marathon 100 SE/30 board .......... $499

---

Memory Expansion

Applied Engineering
23488 1Mb Upgrade for II w/ co 256 .... $359
23487 Macintosh Portable Card w/ 1MB .... $499

Technology Works
23480 2x 1MB SIMM Kit 80ns ........ $108
23482 4x 1MB SIMM Kit 80ns ........ $216
23484 4x 4MB SIMM Kit 80ns ........ $324
23491 4x 4MB SIMM Kit 80ns ........ $324
23499 4x 4MB SIMM Kit 80ns ........ $324
23501 4x 4MB SIMM Kit 80ns ........ $324
23505 Mac Portable 1MB Upgrade Kit .......... $399
23546 Mac Portable 4MB Upgrade Kit ........ $1199

---

Printers

Applied Engineering
23755 DayVideo Color ................ $644

Advantage Graphics
25286 ADE Mouseslick ................. $66

Basic Needs
25282 Cordless Mouse ................. $59

---

800-395-6221
NEW Adobe® PostScript for Under $1800

The new 17-font version of the TI microLaser offers all of the features of the 35-font version — less 18 resident fonts. MacUser awarded the TI microLaser 4.5 mice and said it "outperforms its competitors."

TI microLaser 17-Font PostScript Printer $1795
35-Font PostScript Printer $1995

Graph and Chart Makers

Computer Associates
29816 Cooper Graph 1.3 $127
29260 DeltaGraph v1.5 $109

Presentation Makers

Adus
29782 Persuasion v2.0 $337

Certificate and Award Generators

Broderbund Software
29836 Print Shop $33
29858 Certificate Maker $23

Graphic Utilities

Adobe
29840 SmartArt v2.0 $85

Altys
30544 The Art Importer v2.0 $87

Corel
30462 OmniDraft $69
30460 OmniTrace $104

CE Software
30358 Calendar Maker v3 $10

Frame Technology
29864 FrameMaker 2.1 Mac $745

HyperPress Publishing
30478 Icon Factory $45

Intext
29288 ColorStudio $635

Macromind
29268 Macromind Accelerator $124
29290 Mcromind CD-ROM $126

Olesta Corporation
30302 CertifQuity 2.0 $385

Oldwav
30354 MultiClip $69

Studio Graphics
29272 Colorset $209

Create Professional Animation

FilmMaker from Paracomp gives you professional-quality animation with features such as real-time control over position, scale and rotation of animated objects, as well as full-screen anti-aliasing. And with the help of FilmMaker , your presentations also will take on new power.

FilmMaker (Paracomp). 29900 $437

Unbeatable Service...
We guarantee every hardware product and every office accessory we sell. If you have a problem with any MacAvenue product, call our product support staff at 1-800-766-6221. If we cannot resolve the problem over the phone, we'll replace the product with equivalent merchandise and pay the Federal Express shipping both ways. You can be sure MacAvenue is the most reliable resource for Macintosh products.

MacAvenue's Fast Lane Leasing...
Our leasing program is the best way to keep the latest equipment in your workplace without tying up money in equipment purchases. Your agreement usually can be completed in one day, and we'll give you great rates that are easy on your budget. Call Today! 1-800-395-6221.

Instant Information with MacFax...
MacAvenue's MacFax is the fastest way to get authoritative information on any MacAvenue product. Dial our MacFax number — 1-800-933-9002 — and, within minutes, our computer will fax you specs sheets on selected MacAvenue products. We want you to have up-to-the-minute information because we're convinced well-informed Mac buyers choose MacAvenue.

Do It Yourself Programming

Borland
27592 Turbo Pascal 6.1 $67

Microsoft
27590 QuickBasic $64

Symantec
27582 Norton Antivirus v1.0 $48
27585 THINK C V4.0 $163

Precedent
29920 PowerPoint $234

Master Your Correspondence

Power Up Software offers useful utilities that take charge of all correspondence. Address Book Plus 2.0 offers the most complete way to manage and print your names and numbers. Letter Writer Plus is a handy Desk Accessory that pairs powerful letter-writing and mail-merge tools at your immediate disposal.

Address Book Plus 2.0 $54
Letter Writer Plus, $54
Address Book Plus/ Letter Writer Plus bundle, $82

MacAvenue™
A Division of CompuAdd Corporation

800-395-6221
MacAvenue For Your Holiday Shopping!

NEW MacAvenue Software Paks!

More Fun, Less Money

The MacAvenue Fun Pak includes 5 packages: Hitchhiker's Guide to the Galaxy, Leather Goddesses of Photos, Crystal Quest, Solitaire Royale and Talking Mouse. A $299 value!

MacAvenue Fun Pak 29400 ................................ $39.95

Make Life Better

The MacAvenue Better Living Pak gives you Dinner at Eight (including The Encore Edition and The Weeknight Gourmet), QuickLetter, Synchronicity and Protector Shark. Six packages worth more than $300!

MacAvenue Better Living Pak 29402 ......................... $49.95

ChipSoft
28100 Turbo Tax ................................... $31

Softsync
28110 MacTune 1.3 .................................... $49

SoftView
28114 Soft PC 1.3 ..................................... $245

Data Analysis and Presentation
Paracomp
27806 Paracomp Mio v1.0 ............................ $156

Database
Acrus
27780 4th Dimension v2.1 .......................... $351

27820 File Force ................................. $247

Blyth
27784 OnWord v1.101 ................................. $628

Claris
27789 Claris FileMaker Pro ........................ $216

Fox Software
27790 FaxBase v2.0 ............................... $293

27791 FaxBase Multimedia v2.0 $385

Microsoft
27798 Microsoft File v2.0A ........................ $123

MySoftware
27834 MyAdvanced LabelMaker ...................... $27

27816 MyAdvanced Maillist ......................... $27

Power-up
38442 Address book Plus ............................ $52

Preferred Publishers
27814 Database ................................... $67

Time and Project Scheduling
AEC
29744 Fast Track Schedule ......................... $237

29746 Information Manager ....................... $199

SAM
30410 4-8 Users-App Divvy w/Alarm ........................... $129

30412 8 Users-App Divvy w/Alarm .................. $195

30414 Single User-App Divvy w/Alarm ................ $104

Mainstay
30488 MacFlow ................................... $124

30490 MacSchedule 2.0 .......................... $213

Nola Press
27848 For the Record v2.0 .......................... $29

Office Productivity Programs and Utilities
Borland
30416 Sidekick 2.0 ................................ $59

Microsoft
30196 Microsoft Mail ............................... $85

Spreadsheet Programs/ Templates
Informix
30184 Wingo v1.11 ................................ $245

Microsoft
30180 Microsoft Excel v2.2 ...................... $245

Communications
On the Modem
CE Software
27696 QuickMail 10 Pack v2.2 ................... $313

Software Ventures
28481 Accountant Inc. Professional .............. $168

SoftView
28502 MachTun 1990 ................................ $195

Reality Software
28496 Personal Tax Analyst ...................... $47

Survivor Software
28478 MacMoney 3.5 ............................. $58

MySoftware
27834 MyAdvanced LabelMaker ...................... $27

27816 MyAdvanced Maillist ......................... $27

Power-up
38442 Address book Plus ............................ $52

Preferred Publishers
27814 Database ................................... $67

Education and Entertainment
On the Learning Curve
Bröderbund Software
27958 TypeIt v1.0 .................................. $18

27956 Math Blaster v1.0 ........................... $29

Franklin Software
28024 Language Master .......................... $39

Goldstein & Blair
28036 Mac Bible, 3rd edition ...................... $22

28028 Mac Bible (Super) ......................... $28

Great Wave
27990 KidMath v1.1 ................................. $25

27974 MacTutor v1.2 ............................... $25

Help Software
28038 Desktop Help for Excel ..................... $48

Individual
28030 Training for Pagemaker .................. $38

Learning Company
28020 Reader Rabbit v2.2 ...................... $31

28002 Talking Math Rabbit ....................... $25

Senseware Software
28010 Sensortext Grammer ....................... $50

Simon & Schuster
28018 Typing Tutor ................................. $28

Visionary Software
27954 Synchronicity .............................. $39

Just for the Fun of It
28750 Stupid Mac Tricks ......................... $16

28682 Hardball ................................. $25

28690 Mean 18 ................................. $25

Academia
28700 Cosmic Demo ............................. $40

28702 MacNear (CD ROM) ....................... $34

Bröderbund Software
28668 Ancient Art of War ...................... $25

28670 Ancient Art of War at Sea ................. $25

28666 Shuffletuck Cafe ........................... $22

28676 Simi Valley Workstation ................. $83

Prodigy Services
27712 Pridding Startup Kit ....................... $27

27712 Fangate Plus ............................... $23

Support
28666 NetXpress v.2.0 .............................. $19

28683 Top Network Bundle/Mac ................. $188

Traveling Software
27716 LapLink Connectivity ...................... $119

On the Network
DataViz
27718 MacLink Plus ............................. $118

Farallon Computing
28666 Tomiakun®3.0 ......................... $115

Insignta Solutions
27724 Access PC ................... $81

Microsoft
27708 CD ROM Mac ......................... $119

27760 MS Mail 20 Pack v2.0 ................... $959

27767 MS Mail Server ...................... $236

27767 MS Mail Workstation ................. $83

Prodigy Services
27712 Pridding Startup Kit ....................... $27

27712 Fangate Plus ............................... $23

Support
28666 NetXpress v.2.0 .............................. $19

28683 Top Network Bundle/Mac ................. $188

Traveling Software
27716 LapLink Network Pak ..................... $183

Sophisticated Screen SaVer
After Dark is the Macintosh screensaver that gives you 30 visual options — from whimsical flying toys to colorful fish swimming across the Mac screen. Or combine images in a multi-mode setting. Just let your drawer open screensaver image or create your own logo. After Dark v2.0, 90485 .......................... $24

Software Toolworks
28758 Visionary Software ..................... $38

28759 Casino Master ......................... $38

28760 Casino Master Deluxe ................. $43

Electronic Arts
28654 Bard's Tale ............................... $30

28656 Chuck Vogler Flight Simulator ....... $30

28652 Reach for the Stars ....................... $25

28740 Pipe Dreams .......................... $17

MicroProse
28742 Pirates! .......................... $94

Mindscape
28652 Balance of Power 1990 ................. $91

28636 Deja Vu II ............................... $30

PCW
28708 MacGolf ................................. $39

Premier Technology
28744 NetTalk ................................. $35

28746 Strategic Compuser Plus .............. $35

Sierra-On Line
28724 Kings Quest 3 .......................... $28

28726 Kings Quest 2 .......................... $28

28728 Kings Quest 3 .......................... $28

28714 Leisure Suit Larry I ................. $21

28712 Space Quest 8 .......................... $28

Siicon Beach
28648 Apache Strike ......................... $51

28646 Beyond Dark Castle ..................... $51

Software Toolworks
28658 Life & Death ............................ $35

Spectrum HoloByte
28641 Falcon V2.2 .............................. $18

28644 Trians ................................. $18

28646 Wulfrus ................................. $19

Spinnaker
28616 Sargon IV ............................... $31

The Software Toolworks
28748 Chessman 2100 ........................ $21

XOR
28624 MacGold Classic ......................... $51

28636 MacDude ............................... $51

28630 N.I.'s Challenge V1.2 ................. $54

28626 Road Racer ............................ $39

Music and Sound
 Opcode Systems
28542 EZ Vision ............................... $95

28540 Pro Plus Interface ................. $50

Passport Designs
30256 Encore ............................... $405

800-395-6221
Customer Service Is Our Most Important Product

Tax Help From MacInTax

Four-time World Class and Edgy award winner! MacInTax is the best-selling tax product for the Macintosh. Loaded with new features for 1999! And MacInTax is the only tax product available that prints exact replicas of IRS forms and schedules on blank paper. Full integration with 13 optional state supplements.

MacInTax. 28502 .................. $61

DataDesk 25194 1.5 Function Key Module .................. $42
25184 Mac II/101 Keyboard Platinum .................. $134
25180 Mac II/101 Keyboard, ADB .................. $134
25185 Mac II/101 Keyboard Beige .................. $74
25187 SWITCHCABLE .................. $98
25192 SWITCHBOARD .................. $159
Kensington
25281 Turbo Mouse ADB .......................... $107
25280 Turbo Mouse Plus .......................... $107
Micronfeed 25285 MacTrac (5i, 5/6) .................. $75
Microtouch 25287 Lumbase .................. $185
Mouse Systems
25282 Little Mouse .......................... $77
25284 Touchpad ADB .......................... $77
Seiko
23734 DT3600 Digital Tablet .................. $295

Accessories

American Power
26292 UPS 110V .................. $207
26294 UPS 3700i .................. $337
Apple/Engineering
26917 QuickDraw .................. $205
Calcomp
26913 WIZ .................. $157
MacAvenue
57200 5.25" Disksettes 1.44MB 10% .................. $10.99
57000 5.25" Disksettes 360KB 10% .................. $4.99
41753 Keyboard drawer .................. $19
41019 Klein Keyboard Kit .................. $8.08
41752 Track Keyboard Drawer .................. $50
41601 Track 3.5" Double Rolltop Box (20) .................. $29
41600 Track 3.5" Single Rolltop Box (45) .................. $17.99
Cover-Up
20490 Diskette Wallet 10pk (alligator) .................. $7.5
20490 Diskette Wallet 10pk (blue) .................. $7.5
20491 Diskette Wallet 3pk (Alligator) .................. $5.5
20491 Diskette Wallet 3pk (blue) .................. $5.5
20485 ImageWriter II Dust Cover .................. $8
20484 MacPlus/II Dust Cover .................. $8

The Smaller Mouse
Smaller is better with the Little Mouse. This electronic mouse is 22% smaller than the average mouse, offers 50% higher resolution and uses 100% optical technology. Optical Mouse pad included. (ADB only)
Mouse Systems Little Mouse. 25283 .................. $77

Keyboard Covers

Savvy
57400 3.5" Disksettes D4MF (10%) .................. $24.95
57401 3.5" Disksettes 800K (10%) .................. $13.95
Summographics
26985 10 Pin Flat Plus .................. $318

Sound Interfaces

Farallon Computing
23730 MacRecorder* .................. $158
Passport Designs
23732 MIDI Interface .................. $76

Software

Writing and Publishing

Word Processing, Writing
Ashston-Tate
30600 FullWrite Professional v1.5 .................. $253
Microsoft
30852 Microsoft Word v4 .................. $245
30856 Microsoft Write v4 .................. $77
Nolo Press
29888 WinMaker .................. $34
Springboard/Ssplashmaker
29860 The Resume Kit .................. $124
T/Maker
26986 WriteNow 2.2 .......................... $124
WordPerfect
36951 WritePerfect Mac 2.0 .................. $234

Print Labels Like a Pro

Avery’s MacLabelPro is the answer to all your label printing questions. Includes preset layouts for shipping, diskette, or name badges — virtually any label. Also offers drawing tools, a clip art library, sequential numbering and mail merge capability. Call for information about the different labels available.
Avery’s MacLabelPro v1.0. 30534 .................. $49

Fonts and Font Utilities

Adobe
29834 Adobe Plus Pack v1.0 .................. $107
29835 Adobe Type Set v1.0 .................. $58
29832 Adobe Type Set 2.0 .................. $58
29858 Adobe Type Set 3.0 .................. $58
29835 Adobe Type Set 4.0 .................. $58

Microsoft
30182 Microsoft Office Bundle .................. $253
30580 Microsoft Works v2.0 .................. $177

Accounting/Bookkeeping

Accounting
28893 Ultimate Payroll v4.0 .................. $174
28846 Graphic Arts Billing v2.0 .................. $185

Chang Labs
28490 Rags to Riches II .................. $295

Marketing and Promotions

Distributors
30868 Big Thevision 1.0 .................. $63
Microlytics
30494 Inside Information .................. $68

Working Software
30596 Spellwell v2.2 .................. $46

The Complete Scanning Solution
Scans from books or other originals that won’t fit in the flatted scanner. Saves in EPS, TIFF, MacPaint or PICT formats at resolutions up to 400dpi. MacUser’s review said the Complete PC had “excellent OCR and the best resolution” of the hand-held scanners tested.
Complete PC Complete Halflmage Scanner. 22752 .................. $331

Utilities for Writers/Publishers

Ceepee
30466 OmniPage .................. $104
30464 OmniSpell .................. $69
DataPoint
30438 Taste .................. $98
Lexpertise
36750 MacProof 3.2.1 .................. $115
36780 Correct Grammar .................. $49
Preferred Publishers
36063 Vantage .................. $51
Reference Software
36034 Gummie Mac .................. $50
Working Software
36598 QuickLook v1.02 .................. $72
36566 AccuText .................. $541

Optical Character Recognition

Carer
30610 OmniPage 2.0 .................. $535

Business Software

Integrated/Bundled Applications

Ataris
28894 Ultimate Payroll v4.0 .................. $174
28846 Graphic Arts Billing v2.0 .................. $185
Chang Labs
28490 Rags to Riches II .................. $295

800-395-6221
### 30-Day Money-Back Guarantee

Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

### Toll-Free Technical Support • 90-Day Product Replacement

If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 1-800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We will replace the item and pay Federal Express shipping both ways.

### One-Year Limited Warranty

For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which you are not completely satisfied, and we will pay for Federal Express return freight to you.

---

### Why Buy From MacAvenue?

**That's as easy as 1, 2, 3!**

1. **30-Day Money-Back Guarantee**
2. **Toll-Free Technical Support • 90-Day Product Replacement**
3. **One-Year Limited Warranty**

---

### Try MacsFax!

**800-933-9002**

---

### Why Buy From MacAvenue?

**That’s as easy as 1, 2, 3!**

1. **30-Day Money-Back Guarantee**
   Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

2. **Toll-Free Technical Support • 90-Day Product Replacement**
   If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 1-800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We will replace the item and pay Federal Express shipping both ways.

3. **One-Year Limited Warranty**
   For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which you are not completely satisfied, and we will pay for Federal Express return freight to you.

---

### Data Organization

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE Software</td>
<td>$63</td>
</tr>
<tr>
<td>ICOM Simulations</td>
<td>$36</td>
</tr>
<tr>
<td>On Cue v.1.1</td>
<td>$75</td>
</tr>
<tr>
<td>On Technologies</td>
<td>$47</td>
</tr>
</tbody>
</table>

### Data Storage, Management/Repair

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGHT</td>
<td>$54</td>
</tr>
<tr>
<td>Bravo</td>
<td>$47</td>
</tr>
<tr>
<td>SPAVM</td>
<td>$79</td>
</tr>
<tr>
<td>Central Point</td>
<td>$117</td>
</tr>
<tr>
<td>Fastback 2.1</td>
<td>$98</td>
</tr>
<tr>
<td>Microseeds Publishing</td>
<td>$23</td>
</tr>
<tr>
<td>Norton Utilities for the Mac</td>
<td>$79</td>
</tr>
</tbody>
</table>

### Shortcut and Time Saving Utilities

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy II Mac v.7.2</td>
<td>$24</td>
</tr>
<tr>
<td>Superlaser Spool</td>
<td>$92</td>
</tr>
<tr>
<td>DeskWorks</td>
<td>$328</td>
</tr>
</tbody>
</table>

### Screen Saver Utilities

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>After Dark v.2.0</td>
<td>$24</td>
</tr>
</tbody>
</table>

### Other Utilities

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stufflt Deluxe v.1.0</td>
<td>$62</td>
</tr>
<tr>
<td>Avery</td>
<td>$49</td>
</tr>
<tr>
<td>INIT Manager</td>
<td>$35</td>
</tr>
<tr>
<td>Talking Mouse</td>
<td>$23</td>
</tr>
<tr>
<td>CE Software</td>
<td>$53</td>
</tr>
<tr>
<td>QuickKeys v.2.0</td>
<td>$94</td>
</tr>
<tr>
<td>Virtual (030)</td>
<td>$118</td>
</tr>
<tr>
<td>Dayna Communications</td>
<td>$55</td>
</tr>
<tr>
<td>DOS Mover</td>
<td>$47</td>
</tr>
<tr>
<td>LaserSpool v.2.2</td>
<td>$92</td>
</tr>
<tr>
<td>Suite II 1.2.3</td>
<td>$117</td>
</tr>
<tr>
<td>Print Lin Collection</td>
<td>$58</td>
</tr>
<tr>
<td>Jenkins Express</td>
<td>$28</td>
</tr>
<tr>
<td>Insight Development</td>
<td>$94</td>
</tr>
<tr>
<td>MachPrint 1.2</td>
<td>$48</td>
</tr>
<tr>
<td>Capture</td>
<td>$48</td>
</tr>
<tr>
<td>Now Software</td>
<td>$75</td>
</tr>
<tr>
<td>Now Utilities 2.0</td>
<td>$184</td>
</tr>
<tr>
<td>Snaglet 2.6</td>
<td>$31</td>
</tr>
<tr>
<td>MyDisk Labeler II</td>
<td>$40</td>
</tr>
<tr>
<td>Sticky Business 1.2</td>
<td>$45</td>
</tr>
</tbody>
</table>

### Simplified List Management

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MyAdvancedMailList</td>
<td>$27</td>
</tr>
<tr>
<td>MyAdvancedLabelMaker</td>
<td>$27</td>
</tr>
</tbody>
</table>

---

### MySoftware

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MyAdvancedMailList</td>
<td>$27</td>
</tr>
<tr>
<td>MyAdvancedLabelMaker</td>
<td>$27</td>
</tr>
</tbody>
</table>
11 Mac Portable Tips

Ask John Sculley about the Mac Portable’s hefty weight and unlit screen, and he’s likely to reply, “How about that battery!” True, the Portable has a long battery life, but you can make it even longer if you follow a few simple rules.

By Owen W. Linzmayer

It took NASA to solve the problem of the Mac Portable’s weight — they took it into orbit. For a while, at least, Apple could claim the only completely weightless portable computer.

Some of the Portable’s other limitations are easier to deal with. Extending the battery life, for instance, is simply a matter of following a few guidelines. Here are the rules that every Portable user should know:

1. Force the hard drive to sleep. Normally, after you access the hard drive, you must wait for it to delay until the amount of time has passed that you specified in the Minutes Until Automatic Sleep in the Portable cdev, before it turns itself off. But clicking on Sleep at the bottom of the Battery DA immediately puts the system into sleep mode, thereby shutting off the hard drive. Just press any key (except Caps Lock), and the system wakes up exactly as you left it but the hard drive remains off.

If you get Andrew Welch’s shareware INIT called Portable Siesta (see Figure 1), putting your Portable to sleep is even easier — just press a user-specified key combination (the default is the Escape key). Portable Siesta is available from Zmac; the shareware fee is $5.

2. Avoid the Control Panel. Every time you open the Control Panel, the Mac accesses the startup drive. If you must make changes to the Control Panel settings, do them all at once.

3. Don’t shut down. The Portable consumes the same amount of power in the Shut Down and Sleep modes (see Figure 2). The only reason to choose Shut Down is if you are going to install an expansion card or attach a device to one of the ports on the back of the computer. (Apple does recommend that you shut down at least once a month.) Otherwise, choose Sleep so that all of your applications and documents are instantly available when you issue the wake-up call by touching a key. Aside from this convenience factor, you save the power required to spin up the hard disk and reload files from disk.

4. Open files in batches. The hard and floppy drives are the most power-hungry components of the Macintosh Portable; both require roughly the same amount of power to spin for any given length of time. Whenever possible, open simultaneously any of the documents that you plan to use in a session. To do so, use the shift-click method to select more than one document in a folder and choose Open from the File menu or press Command-O. This launches the parent applications and opens the designated documents all in one step.

5. Create a startup RAM disk. Whether you configure memory as a RAM disk or leave it available for applications doesn’t affect how much power the Portable uses, so
The plane's gone down, but you've managed to swim to safety on a nearby desert island — holding your Mac Portable over your head. How long do you have before you must stop computing?

if you have at least 2 megabytes of memory, specify a RAM disk, using the Portable cdev (see Figure 3). Make it large enough to hold the required System files plus any heavily used applications and documents. Click on the RAM-disk icon on the Finder’s desktop, and then choose Set Startup from the Special menu. Now instead of spinning the hard disk on startup, the Portable can quickly fetch these files from the very low-power RAM disk. Although the RAM disk retains its contents even when you choose Shut

The Death of a Battery

The plane's gone down, but you've managed to swim to safety on a nearby desert island — holding your Mac Portable over your head. How long do you have before you must stop computing?

The Portable keeps track of available power and warns you four times as the battery's charge gets low. The first alert box (see Figure A) appears when you have roughly 45 minutes of power remaining (when the thermometer gauge in the Battery DA drops below the reserve line). Once you're in a low-power situation, a battery icon flashes alternately with the Apple icon at the extreme left side of the menu bar. If you ignore the subsequent warnings, you are given one final warning when ten seconds of power remain.

After that, the system goes into a special sleep mode—a coma, if you will—and you can't wake it unless you change batteries or switch to AC power. If left in its coma for more than five days, the Portable will lose all the contents of its RAM. Also, the life of the battery will be somewhat reduced, although it can still be recharged.

Figure A: When you see this alert box, you have 45 minutes of power left before your Mac goes into a coma.

Create and Update Presentation Quality Gantt Charts quickly and easily! Just draw activities right on screen, customize your bar types and add labels, graphics, text blocks and multi-level sub-activities. When you need to make changes to your schedule, updating is a SNAP!

Some features:
• Schedule in hours, days, weeks, months, quarters, years, fiscal years and generic formats.
• Display start and finish dates in columns, or align to bars.
• Display multiple activity columns.
• Import and export data.
• Much, much more!

Please call for your FREE interactive demo kit.
(800) 346-9413 or (703) 450-1980.

FastTrack Schedule™ 1.5

So much to schedule—so little time.

"Provides the highest degree of functionality and the best on-screen and printed graphic ability in its class." MacUser, October 1989.

Please circle 106 on reader service card.
Your data is your data. And to keep it that way Kensington introduces PassProof™ — the first complete data protection system for the Macintosh®.

First, the hardware.
A rugged cylindrical lock keeps your disk drive safe from intruders. Two sturdy metal plates with tamper-proof screws block both rear-floppy and SCSI ports.

Next, the software.
As the master user you assign yourself a master password. From then on, you use the password as your key to unlock the system. You can add or delete additional users whenever you want. And PassProof’s User Log keeps track of every attempt to use your Mac.

Want to “lock up” in a hurry? Quick Cover™ is PassProof’s screen-locking program that lets you secure your Mac on command.

Best of all PassProof is user friendly.
Unless, of course, the user is unauthorized.

Ask your dealer about other Kensington accessories including cable and lock systems for all Apple and Macintosh computers, including the Mac Portable and the LaserWriter® II. Or call for a free brochure at 800-535-4242. Outside the U.S., call 212-475-5200.
The Portable is a robust piece of hardware, so you needn't worry too much about losing work in progress.

Down from the Special menu, for peace of mind save any really important files to a diskette every once in a while.

6. Use a RAM cache. The General cdev has an option for designating a portion of memory as a RAM cache. Frequently requested data resides in the cache, so if it is asked for again, it can be accessed much more quickly from RAM than if it has to be retrieved from a disk drive. Because the drive needn't be accessed, you won't waste power.

7. Load entire applications into memory. Some applications (such as Microsoft Word) let you specify whether the entire application should be loaded into memory when launched. Say yes. Forcing the whole program to load at once means that you avoid unnecessary disk access later on.

8. Turn off the speaker. The higher you set the sound volume, the more power is necessary to drive the speaker. Use the General cdev to lower the volume of the internal speaker as far as it will go (see Figure 4). With the speaker thus disabled, the Mac flashes the menu bar whenever a system beep occurs.

9. Use any desktop pattern you want. Some people suggest using the General cdev to change the desktop pattern to all white. The assumption is that black pixels are "on" and therefore require more power to display than white pixels. In actuality, the Portable uses an active-matrix LCD (liquid-crystal display) panel, with each pixel controlled by its own transistor. It requires power only to change the state of a pixel, and even then the amount of power involved is negligible.

10. Quit telecommunications applications when you're not using them. Open telecommunications applications require the Portable to supply power to the internal modem even if you aren't connected to an on-line service. But if you quit the application, the Portable saves power by turning off the modem.

11. Don't save as often as usual. The Mac Portable is a robust piece of hardware, so you needn't worry too much about losing work in progress. If you have a macro utility that saves to disk automatically at periodic intervals, or if the applications you use have this as an option, disable it.

---

BIG SAVINGS FOR SMALL BUSINESS.

Ehman has put together a special promotion that's directly targeted to meet the needs of small businesses. For a limited time you can now get our popular 20 MB hard drive and a copy of Business Sense accounting software, both for under $300.

Business Sense, which regularly sells for $199, is one of the all time favorite Macintosh accounting programs. It's easy to set up and use and is designed especially for companies with under 50 employees. Macuser magazine gave it a top rating of 4.5 mice and said it "was on the verge of greatness".

By now you probably already know that Ehman drives are renowned for great value. You may not be aware that our new E-Series line offers unsurpassed quality, backed by a 30 day money back guarantee and a 2 year warranty. Give us a call today and you can start counting your savings tomorrow.

Call 1-800-257-1666, Fax 1-307-789-4656

Please circle 125 on reader service card.
A lot of manufacturers say they have the best trackball, but only the Kensington Turbo Mouse® has the awards to prove it.

MacUser gave it the coveted Five Mice. And the readers of Macworld magazine voted it “Best Input Device” — not just once but four years in a row.

What makes Turbo Mouse outshine the rest? Superior optical hardware and unique software are the difference.

A light click sends the signal quietly and instantly.

One button transmits a normal mouse command. The other locks the button in the down position for extended selection and graphic applications. You decide which button performs what function.

Press both buttons simultaneously, and our time-saving chording feature executes one of seven useful commands such as “save,” “print,” “quit,” or “undo.”

Navigating the screen is easy. A comfortable ball position makes the cursor easy to move. And a smooth ball movement means no jumping or sticking.

What’s more, Turbo Mouse has unique software that lets you adjust both acceleration and double-click speed to exactly match the way you work. Move the ball slowly and the cursor moves pixel-by-pixel. Move it fast and it speeds across even the biggest screen.

The next time you read another claim for a trackball, remember the one that has earned all the acclaims. Turbo Mouse.


KENSINGTON®

Turbo Mouse, Kensington and the Kensington logo are registered trademarks of Kensington Microsco Limited. Apple and Macintosh are registered trademarks of Apple Computer Inc. © 1990 Kensington Microsco Limited.
9 out of 10 Mac users use Microsoft Excel for Macintosh.
What are we missing?

Tell us what’s on your mind and it could end up on your screen.

Send to: Microsoft Excel for Macintosh Development Team, Dept. N15, One Microsoft Way, Redmond, Washington 98052

Doing wrong?

Microsoft
Making it all make sense
It's always been Powerful.
It's always been Precise.
It's always been the Professional Choice.

Now it's easy to use.

The new tools you'll find on the moveable Tool palette are: the Polygon Picture Box tool for multisided picture boxes, the Rotation tool for manual rotation of objects, and the Zoom tool for enlarging or reducing the document view.

You can specify page view from 10% to 400% in .1-point increments. View percent can be specified in a field with mouse clicks or by clicking and dragging with the Zoom tool selected.

A variety of specifications—such as font, size, style, leading, location, angle of rotation—are displayed for text boxes, picture boxes, and lines. You can change values interactively on-screen without using a menu or dialog box.

Creating multiple-page documents is easy with a new palette that enables you to insert, delete, and move pages graphically by dragging page icons.

A pasteboard lets you position pictures and text off the page, create bleeds, and design multipage spreads up to 48" x 48".

Library palettes provide an easy way to store text and graphics. You can copy and paste or drag items from an open library onto a page and between open libraries.

QuarkXPress
The Choice for Publishing Software Worldwide
Visit your local dealer and experience the power, precision, and ease of QuarkXPress for yourself.

Please circle 410 on reader service card.
New Year's Resolutions

Stop feeling guilty.
Here are ten simple things you can do to save your Mac (and your sanity to boot).

By Michael Swaine

Every year at about this time, I clothe myself in earnestness like a politician on the stump and compose a list of New Year’s resolutions. I am convinced that this is a fine and noble thing to do, and doing it makes me feel like a better person: one who eats right, gets plenty of exercise, remembers everyone’s birthday, and backs up his hard disk.

This feeling lasts about a week into the new year. By then I have violated every resolution I haven’t forgotten first. The whole experience leaves me so demoralized that I almost consider casting off the tatters of my self-respect and running for public office.

This fall I tried something different. I made up a list of resolutions again; I don’t seem to be able not to engage in this particular bit of depravity. But I won’t have to worry about breaking them this January, because I’m not making them for myself.

They’re for you.

Here are ten resolutions for using your System (or your system) wisely in 1991. They’re so fundamental that you’re probably already honoring some of them now and can check them off immediately. And I’ve given you a weasel clause in each resolution. As Leona Helmsley could easily have said, “I wouldn’t accept a New Year’s resolution without a weasel clause. Why should you?”

In each of the resolutions, I is you. In the explanation that follows each resolution, I is me. I mean I.

1. I resolve to save my work often enough.

Often enough is the weasel clause in this one. It means whatever you make it mean, but I recommend you try one of the following interpretations:

• So often that, when my office mate trips over the power cord and the screen goes blank, I ask her if she’s all right before I ask myself how long it’s been since I saved my work.
• Or

• So often that it becomes a reflex. If you press Command-S whenever you get up to refill your coffee cup, if you press Command-S before answering when asked a question, if you press Command-S whenever you pause to gather your thoughts or wool, yours is the world and everything in it, and that’s not bad. So forget all that right-brain/left-brain stuff. This is a spinal task.

2. I resolve to back up all my work adequately.

There are a lot of strategies for backing up files. Adequately refers to the number of backup copies you keep. Two is the minimum for any files you really care about, but if you think you need five, make them. And don’t worry that the shrink-wrap license agreement on most software packages says that you’re allowed to make only one backup copy. This unenforceable and obnoxious drivel was written by some anal-retentive lawyer who should be shrink-wrapped.

3. I resolve to organize my files somehow.

It’s amazing how little it matters just how you organize your files. And it’s amazing how much it matters that you have some system of organization and that you respect
The only table built around the Macintosh.

MacTable's four surfaces are interchangeable, and meet Macintosh modular design specifications.

Each rock-solid surface can be level, or tilted to a slight angle for maximum comfort.

A special pocket fits your Macintosh SE or Plus like a glove. Other configurations support Mac IIs.

The sturdy cross-beam features a cable track to keep cords and wires safe and untangled.

All this and it's affordable, too.

58" MacTable: $559
46" MacTable: $529
Roll-away cabinet: $159
(To order MacTable, or alongside to support UserWriter)

30 day return guarantee.

To order MacTable:
or for more information,
call toll-free (800) 722-6363 or (206) 481-5454 in WA.

PromoCo
5013 32nd Av, Redmond, WA 98052

Price does include UPS shipping. MacTable design is patent pending.

MacTable is a registered trademark of Scandinavian Computer Furniture, Inc. Macintosh and UserWriter are trademarks of Apple Computer, Inc. Prices and design subject to change without notice.

Please circle 20 on reader service card.

POWER TOOLS

BEATING THE SYSTEM

It's amazing how little it matters just how you organize your files — and how much it matters that you have some system of organization.

There's a trick, though, and unless you know it, you will be forever undermining your organizational efforts. It's very simple: Pay attention when the Save As dialog box comes up the first time you try to save a newly created file. That way, you can save the file into the folder in which it belongs rather than into whatever folder you happen to have opened most recently, which is exactly what will happen unless you specify otherwise. The first Save of a new file, however, is not a spinal task.

4. I resolve to use spelling checkers appropriately.

I wish I could tell you what that might mean. So many computer-magazine reviewers have written confidently about the virtues of these programs that I know they must be good for something. It passed my understanding what that might be, because it sure isn't proofreading. Here's my advice: When you don't really care about errors in your copy, send it off and don't worry about it. When accuracy matters, have the copy proofread by a human being. In all other cases, use a spelling checker.

5. I resolve to rebuild my desktop annually.

That's how often Apple recommends. Rebuilding the desktop improves your system performance, so you might want to do it today, but the weasel word annually gives you the rest of the year to get around to it.

6. I resolve not to use commercial software or shareware without paying for it.

There's no weasel clause in this one. Commercial software and shareware authors deserve compensation and sometimes even respect for their efforts. It's a matter of payment for value received. If you use it, pay for it. Unless, of course, you're a journalist and it's a review copy.

7. I resolve to send in my registration cards promptly.

Sending in your registration cards is just good sense; it makes it possible for the company to reach you in the event of...
a product upgrade or recall. However, you should feel no obligation to be accurate or even credible in supplying any demographic information requested on registration cards. Say you live on the moon and own two Crays if you feel like it. No doubt, accurate information about your buying habits and the amount and value of electronic equipment at your site is valuable to the company, but what were we just saying about payment for value received?

8. I resolve to keep my computer reasonably clean.

Some day it may save your life. No, I think that’s your M-16. Anyway, some people say that you shouldn’t eat or drink near a computer. This makes no sense to me; what I think they mean is that you shouldn’t crush potato chips into the keyboard or pour liquids on the motherboard. You shouldn’t. I avoid doing those things myself and otherwise try to keep a clean machine. It’s not only because of the risk of data corruption, hard-disk crashes, and fried motherboards, although those are all on my personal list of Catastrophes I’d Prefer to Avoid. I just can’t handle any more verbal abuse from the service technician who has such a thing about dog hair.

9. I resolve to experiment.

Try new things. Let someone else try them first, but try them. Continue to learn about the system software and applications you think you know well. Try to learn one new keyboard command equivalent a week for, oh, a week or so — not because keyboard command equivalents are necessarily faster or easier or more impressive to your friends but because ease of use is context-dependent. The keyboard command equivalents that are of any use to you are the ones you know in your bones. Teach your bones some new tricks. Ask questions, and be neither too arrogant nor too shy. You don’t know much, but neither does the so-called expert down the hall. We’re all new to this.

10. I resolve to look out of the window now and then.

Smell the roses. Or at least the coffee. Go for a walk. Spend more time with your family. Give your dog a good brushing. There is no keyboard command equivalent for real life.

In real life, Michael Swanee writes about HyperCard and other hyperstuff in HyperPub, a hypermedia journal published by The Prose Lab, 31 Patrick Road, Santa Cruz, CA 95060; (408) 458-8584.
The Image Club Graphics Typeface Library

600 Typefaces

The Image Club Graphics Library is one of the most comprehensive collections of typefaces available today. With over 600 typefaces, including popular monospaced and proportional fonts, the Image Club Graphics Library offers something for everyone. Whether you're looking for a classic serif font or a modern sans-serif typeface, you'll find it here. The library also includes many different styles and weights, so you can choose the perfect font for your project. Plus, with the Image Club Graphics Library, you'll get the highest quality typefaces at an affordable price. So why wait? Get your Image Club Graphics Library today and start creating amazing designs. Orders within the USA: 800 661 9410

Macintosh Version

The Image Club Graphics Library includes both type 1 and type 3 PostScript fonts, ensuring compatibility with virtually any Macintosh application including Adobe Type Manager™. With ATM™ you can choose from any one of our typefaces and place them on your desktop, or on the Art+TypeVendor™ CD-ROM. Art+TypeVendor™ contains our entire library of over 600 typefaces, or as the Art+TypeVendor™ CD-ROM.

Desktop Type Store

The Art+TypeVendor™ CD-ROM is a must-have for any Macintosh user. It includes 200 fonts and a variety of symbols, making it perfect for desktop publishing and other graphic design applications. The CD-ROM also includes a powerful font manager that allows you to easily browse and organize your fonts. With the Art+TypeVendor™ CD-ROM, you'll have access to the latest typeface technology and be able to create stunning designs with ease. Orders within the USA: 800 661 9410

600 Typefaces

The Image Club Graphics Library is available in both Macintosh and Windows versions. With over 600 typefaces, including popular monospaced and proportional fonts, the library offers something for everyone. Whether you're looking for a classic serif font or a modern sans-serif typeface, you'll find it here. The library also includes many different styles and weights, so you can choose the perfect font for your project. Plus, with the Image Club Graphics Library, you'll get the highest quality typefaces at an affordable price. So why wait? Get your Image Club Graphics Library today and start creating amazing designs. Orders within the USA: 800 661 9410

Macintosh Version

The Image Club Graphics Library includes both type 1 and type 3 PostScript fonts, ensuring compatibility with virtually any Macintosh application including Adobe Type Manager™. With ATM™ you can choose from any one of our typefaces and place them on your desktop, or on the Art+TypeVendor™ CD-ROM. Art+TypeVendor™ contains our entire library of over 600 typefaces, or as the Art+TypeVendor™ CD-ROM.
System 7.0 Watch: The Virtual Napkin

In months past, we’ve engaged in some creative visualization, picturing the features of Apple’s long-awaited System 7.0. But we haven’t spent much time thinking about what use we might make of these features when they actually arrive. Because Apple has given us some more visualization time before we actually see System 7.0, I’d like to introduce one use to which it can be put: To develop the 1990s version of the paper napkin.

In his book Shared Minds (Random House, 1990), Michael Shrage takes his readers on an urban safari, through remote access and darkest databases, through research labs and corporate conference rooms, in search of the ways in which computers might be used to aid collaborative work. Along the way, he encounters more-primitive beasts, including such traditional aids to collaboration as the paper napkin.

Shrage is quite convincing in his presentation of the paper napkin as a tool for collaboration.

Here’s the scenario: You’re having lunch with a colleague, say, and discussing the structure of a particularly tricky negotiation in which you’re both going to be involved. You want to present the points of the case in an outline that makes no sense to you. After some fruitless arguing, he pulls out a felt-tip pen and sketches the structure of his argument on a paper napkin and then takes your napkin and sketches what he takes your outline to be. Now you see why he has organized his points as he has, but you also see how he has misunderstood your intended organization. No, you tell him, taking over the napkins and pen, this point goes here and this point is really this… He finally gets it and requests another napkin to sketch out a new organization based on your ideas and his. After dessert, you take the napkin back to the office and turn it into a laser-printed memo.

Now here’s the question: If you had been in the office, at your computer, with an outline of your intended presentation on the screen and your colleague there, looking over your shoulder, how would the scenario have played? If the two of you had been talking to each other on the telephone? Sending E-mail messages back and forth? Would the collaboration have been as fruitful, as efficient, in any of these other scenarios?

Shrage doesn’t think so. He thinks there are some tasks for which it’s still hard to beat a felt-tip pen and a paper napkin. And the kinds of tasks he has in mind are precisely the kinds that require collaborative effort.

By collaboration Shrage means more than just communication. What makes the napkin so useful is that you can pass it back and forth, refer to it, mark on it. Like a blackboard (another good collaborative tool), it gives the collaborators what Shrage calls shared memory. In addition to the channel of communication, collaboration requires an area accessible to both (or all) collaborators where information can be viewed and manipulated by all. Mere communication doesn’t have that. It lacks a quality of napkininess.

There are some drawbacks to the paper napkin as a tool for doing serious work. One is the awkwardness of making changes in the model. Another is the limited size of the napkin. But these are the same drawbacks that a typewriter has when compared with a word processor. It sounds as if what we need is a virtual napkin.

Here’s that scenario: You and your colleague are talking on the phone, both of you looking at and fiddling with and annotating the same diagram on your respective screens. No sooner do you make a change than the results appear on the other screen. If you want a small sense of what this kind of collaboration might feel like, try plugging your mouse (when the Mac’s off) into a colleague’s spare ADB port and sharing a screen for a while.

That’s what Shrage’s book is really about: electronic napkins; electronic blackboards; conferences in which everyone can electronically manipulate text, pictures, and models in a shared space. Tools such as these do actually exist, and some companies and research institutes are exploring their uses. There are even some commercial groupware products that touch on these capabilities.

But to do collaboration right, there are some fairly specific operating-system capabilities that would be very helpful. Transparency of access to information across networks and across phone links. Ways for applications to talk to one another. Ways for chunks of information to be shared rather than merely sent. System 7.0 supplies just these capabilities.

The significance of System 7.0 will be in the new kinds of applications it allows developers to create. Collaborative tools could well be the most significant of these.
Today the Macintosh is no longer a stand-alone computer. Macs are found in every type of department and every type of business. And they are not just running DTP applications. Spreadsheets, word processing, accounting packages, engineering applications, multimedia – Macs are running whatever business needs. They are interfaced with IBM mainframes, VAXes, Sun and other UNIX workstations, and MS-DOS personal computers.

They’re doing all this now and will be doing it even more extensively in the future.

Business buyers of Macintosh products have to know how well the products they are considering perform in these challenging environments.

That’s why MacUser, the leader in providing brand specifiers objective, thorough and reliable information, announces the opening of the NetWorkShop, a major new extension of its MacUser Labs.

The only independent testing facility for Macintosh products intended for networked systems.
The Premier Testing Facility for Macintosh in the 90's

From the moment plans were begun to the time the last wires were punched down, no expense was spared to ensure that MacUser would develop the industry's most authentic workgroup environment dedicated entirely to connectivity, networking and productivity issues. As different platforms and new technologies proliferate, the NetWorkShop will emerge as an indispensable information resource for Macintosh business buyers and vendors.

A Staff of Experts

Headed by Technical Director Henry Bortman and Labs Director Andrew Eisner, the staff of the NetWorkShop represents a remarkable 40+ years of experience in a field just over five years old. Each lab member has a recognized standing in the Mac industry. Together they form a highly coordinated team with an unassailable reputation for integrity.

An Unparalleled Installation

MacUser Labs' NetWorkShop is a one-of-a-kind facility with the capacity to hold 60 CPUs plus monitors and printers. It has custom-designed racks connecting all the CPUs to a patch panel where any CPU can be connected to LocalTalk, Ethernet or Token Ring. On site are over 30 Mac's of all kinds, a NeXT workstation, a Sun SPARCstation, two micro VAXes, and four IBM compatibles; Novell NetWare and 3COM 3+0 Open File Servers, and a variety of routers and gateways. It incorporates the major operating systems including UNIX, VMS, DOS, OS/2 Windows, and Mac OS. Products to be tested include big servers, 10BASE-T Ethernet cards and concentrators, multiuser databases, routers and gateways, network management products, Mac as a workstation, terminal emulation software, multi-platform and multi-protocol integration, and any Macintosh product capable of operating in a networked environment.

Real World Testing

No ivory-tower analysis can provide meaningful information to serious buyers. MacUser Labs' NetWorkShop has been designed to simulate conditions likely to be encountered in any modern business environment. The staff contacts vendors and buyers to pinpoint the technical issues and characteristics that distinguish the products, then develops test scripts with the goal of asking the right questions and finding the answers.

Survival Information for Dealing with the 90's

The real art of lab testing is interpreting data - distilling it into critical information buyers can use to make intelligent purchase decisions. We analyze the data, interpret it, then write insightful recommendations that buyers must have to make product choices appropriate to their specific business requirements.

The value of MacUser Labs' findings is measured by the vast sums that companies are ready to commit, now and in the future.

Sums that are always significant and often awesome. MacUser Labs reports save buyers time, money, and take the risk out of their recommendations. Just as any serious buyer needs the information we provide, any serious marketer needs to know how his product performs in these demanding situations.

MacUser-PREFERRED for Information

MacUser Labs' NetWorkShop is yet another example of the many invaluable services on which MacUser has built its reputation in this highly important, rapidly growing industry.

The NetWorkShop employs the same high standards of accuracy, reliability and pertinence that has gained MacUser its remarkable degree of influence among today's Macintosh Brand Specifiers.

Month after month, MacUser produces noticeable, quality results. In testing. In reporting. In its unrivalled combination of editorial and readership. MacUser is simply the best information resource for Macintosh products.
Now $4.95 Stops The Clock On Over 100 GEnie Services.

Now enjoy unlimited non-prime time usage of over 100 popular GEnie Service features. For just $4.95 a month.* You get everything from electronic mail to exciting games and bulletin boards. Nobody else gives you so much for so little.

Plus enjoy access to software libraries, computer bulletin boards, multi-player games and more for just $6 per non-prime hour for all baud rates up to 2400. And with GEnie there's no sign-up fee.

Sign-up today.

*Moneyback guarantee
Sign up now. If you're not satisfied after using GEnie for one month, we'll refund your $4.95.

3. At the U# prompt, enter XTX99495,GENIE then press RETURN.
4. Have a major credit card or your checking account number ready.

For more information in the U.S. or Canada, call 1-800-638-9636.

GE Information Services

*Applies only in U.S. Mon-Fri, 6PM-8AM local time and all day Sat, Sun, and select holidays. Prime time hourly rate $18 up to 2400 baud. Some features subject to surcharge and may not be available outside U.S. Prices and products listed as of Oct. 1, 1990 subject to change. Telecommunication surcharges may apply. Guarantee limited to one per customer and applies only to first month of use.

Please circle 366 on reader service card.
Do you take pictures?

Get ready for desktop photography. Putting color photos onto your Mac has become both easy and affordable, thanks to filmless cameras.

By Thom Hogan

Have you ever noticed how many desktop-published documents look so well, computer-generated? It doesn’t help that most of them stick to tried-and-true Times and Helvetica typefaces (my favorite combination is Palatino for text and Futura Bold for headlines, but that’s another column). The most telltale sign that a document is desktop-published, however, is the artwork.

That’s not to say that the artwork isn’t good. I’ve seen some very impressive computer-generated drawings, with a pizzazz and style that wouldn’t have been possible with traditional methods. But the problem is that computer art, whether drawn from scratch or served from a can (well, a floppy or a CD-ROM), tends to be very precise. Straight lines are straight, color fades are linear, fills are perfect, and so on and so on. I’m not here this month to berate computer art, but it is the very precision of computer-generated illustrations that calls attention to the ingredient missing from most desktop publishing: photographs.

Photography in desktop publishing? Sure, no problem. Let’s see, first I go out with my 35mm camera and take some photos. I send the film off to the lab and wait for it to come back. I find a shot I like and send it back to the lab to have it printed in 8 x 10 form, cropped and dodged as necessary. When the print comes back, I stick it into my scanner (or go to use one at the local service bureau). After a few test scans and adjustments, I complete my scan and save the document. Next, I bring up the document in Digital Darkroom (for black-and-white) or Adobe Photoshop (for color) and work on it some more (there’s another column idea). I save the results and pop on over to my desktop-publishing program, import the picture, and place and crop it. Now, if the photo is color and I’m using PageMaker, I make sure to use PrePrint to process it. If, on the other hand, I’m in a QuarkXPress 3.0 mood this week, no additional steps are really necessary. I send the result to my local Linotronic bureau, and next thing I know, I’ve got desktop publishing with photos in it.

Seems like a lot of steps, doesn’t it? Wasn’t the computer supposed to improve my productivity? Am I avoiding photography in my desktop publishing because it’s just too hard to use? The answers, respectively, are yes, yes, yes, and yes.

There’s got to be a better way.

Actually, the better way is Canon’s, and it has been available for well over a year. It’s only as I write this that Canon has finally figured out that there’s a ready market for another one of its nifty engineering toys. (Canon has a reputation for inventing great things that it can’t figure out how to sell: Witness the LaserWriter, which uses a Canon-invented engine that Canon never managed to sell to users in quantity under its own name.) This year’s toy (excuse me, make that tool) is, ta-dah, the Canon XapShot (pronounced zapshot).

The XapShot is an electronic-imaging camera. It works much like a run-of-the-mill...
This used to be a Full-Page Ad.

Compress files. Save disk space.
Save modem and network transfer time.
Enough said. Just StuffIt!!!

35mm point-and-shoot camera, but it stores images (up to 50) on an itty-bitty floppy disk instead of on traditional film. Using the XapShot camera is a little eerie. It makes an almost inaudible hum (the sound of the floppy-disk drive turning the 2-inch disk) when turned on and ready to shoot. When you press the shutter release, you don't hear much of a click, and it doesn't seem like anything has happened (unless you have the flash on). A small LCD display reports a few things, most notably which picture you're on.

Photography buffs will find the camera basically featureless. The 11mm f2.8 lens is about the equivalent of a normal 60mm lens on a 35mm camera. Focusing is automatic, except for macro, which presets the focus at 12 inches. The flash choices are always on, automatic, or off. A backlight-compensation button provides an extra 1.5 stops of exposure, although the button is poorly designed so it's impossible to tell when you've engaged this function. The viewfinder is small but very near the actual lens, so parallax on close-ups is admirably small. There's no lens cap, but the lens itself is covered with a clear glass pane, which you need to keep clean of the usual fingerprints and dust. The whole unit weighs in at about one pound with the battery pack installed and fits into the pocket of my walking shorts. The battery

If you want to add color photos like these to desktop-published documents, using an electronic-imaging camera is an inexpensive and easy-to-use solution — and you won't need a scanner.
Someone Has Some Explaining To Do.

**MIRROR TRINITRON**

**$2997** including interface and software

The Mirror Trinitron uses Sony's patented Trinitron tube for the sharpest color image available.

The Mirror Trinitron comes with an 8-bit Interface (MacII or SE) that delivers 256 vivid colors, and software enhancements like Pop-up Menus, Enlarged Cursor and Menubar options, Screen Saver, and Screen Copy.

The Mirror Trinitron is available direct from the manufacturer with no Rep commissions or Dealer markup.

There Had Better Be A Good Reason To Pay 47% More!

We've long admired the Radius Trinitron Color Display. That's why when we designed our first color display system, we chose to include many of the same concepts. Such as Sony's patented Trinitron tube which is now the standard for the Macintosh. And an 8-bit Video Interface that delivers 256 colors. And software enhancements like Enlarged Cursor, Enlarged Menubar, Screen Saver, and Screen Copy. And a built-in tilt and swivel base.

**So Where's The Difference?**

The fact is, in deference to Radius, we've had a much longer time to design a color display. That's why we've been able to build in some important differences. Here are just three:

1. Our ProView Interface delivers 256 color at 72dpi for true WYSIWYG scale so that the image on screen is the same as what you'll get from your printer.
2. Our Pop-up Menu feature is the next logical upgrade to Tear-off Menus, and our Stroke feature saves you both mouse and keyboard time.
3. **FREE!** We are including VideoPaint from Olduvai for a limited time at no charge! VideoPaint is the professional color painting and retouching application that was rated 5 mice by MacUser France.

**The Big Difference: You Pay 47% Less When You Purchase Factory-Direct**

Why pay all of the additional marketing expenses plus the dealer's profit? We've made installing and using the ProView Trinitron so easy that there's no reason to pay a dealer's 40% margin. Technical support is only a phone call away (And who better to ask about a product than it's maker?)

**Compare For Yourself!**

<table>
<thead>
<tr>
<th></th>
<th>Radius</th>
<th>Mirror</th>
</tr>
</thead>
<tbody>
<tr>
<td>20&quot; Trinitron</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>8 Bit/256 Colors</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>WYSIWYG scale</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pop-up Menus</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Tear-off Menus</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Enlarged Cursor Option</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enlarged Menubar Option</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Screen Saver</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Screen Copy</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>VideoPaint (495 value)</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**LIST PRICE**

<table>
<thead>
<tr>
<th></th>
<th>Radius</th>
<th>Mirror</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5690</td>
<td>$2997</td>
<td></td>
</tr>
</tbody>
</table>

*Try one for 30 days, if you don't love it... I want it back.*

Ronald Eibensteiner, President/CEO

**TECHNICAL SUPPORT HOTLINE:** (612) 633-2105

Hours: Weekdays 8 a.m. - 6 p.m. CST

Telephone: (612) 633-4450

Fax: (612) 633-3136

2644 Patton Road, Roseville, MN 55113

U16b

ProView is a registered trademark of Mirror Technologies, Inc. All other trademarks and tradenam es belong to their respective holders. Comparisons made on GS1500. © 1990, Mirror Technologies, Inc.

Please circle 111 on reader service card.

Call Today! Order Factory-Direct.

**1-800-654-5294**
is rechargeable, and Canon claims that it lets you take about 800 pictures when it’s fully charged, assuming that you avoid the flash (more on that in a bit). As the old adage goes, your mileage may vary; mine sure has.

You can record over previously shot pictures. (There is a protection mechanism to keep you from doing this accidentally, but the temptation is great to start playing mental games: “Hm, this shot is better than that third one I took; I’ll just record over it.” Don’t do it! When you get home you’ll find that it was the fourth shot, not the third, that you wanted to record over. Bring extra floppies instead.)

With the camera comes a battery-charger station that also can act as an AC adapter and video-playback base station. You don’t need the charger to play back pictures, but it is usually most convenient to use it—you often spend more time reviewing pictures than you do taking them, and you won’t want to exhaust the battery.

For those of you who for some reason don’t like the Canon, Sony makes a similar model, called the Mavica. I don’t like it as much: It’s a little bulkier, the lens doesn’t seem to be quite as good, and the playback method is a lot more cumbersome. Besides, I got my XapShot for $371, and the cheapest Mavica I could find was $498. Nevertheless, the cameras are basically the same, and if the Mavica had been cheaper than the XapShot, I probably would have bought it instead.

One big negative point regarding these electronic-imaging cameras is that they eat batteries like I do cookies. I told you that my mileage varied—in some cases, I didn’t even manage to fill a disk with pictures before the battery needed a boost. When you first start using the camera, I can guarantee that you’ll end up missing that “great shot” because the batteries died in the middle of your photo session and you really don’t want to carry the AC adapter around with you, as that defeats the whole purpose of having a lightweight, portable camera in the first place. The solution: Buy an extra battery pack, and be diligent about keeping packs charged when you’re not using the camera. Turn the camera on only when you’re going to take a picture (learn what it feels like when the On button is activated), and avoid using the flash whenever possible.

Fortunately, the camera automatically powers itself down when you don’t use it for more than a few seconds, but it’s still easy to keep your finger partway down on the shutter while you’re waiting for that “perfect” picture. Remember, though—all that time, you’re also powering a small disk drive.

The battery adapter has an LED display that tells you when the battery is charging—when the light goes off, the battery is fully charged. Thank you, Canon. Most chargers I’ve seen give no indication of when the battery is charged.

When the XapShot first appeared (I initially wrote about it in my newsletter back in the fall of 1989), the cheapest price I could find was $1,299. Pretty pricey for a simple camera. No longer, however. Yesterday a photo discount store in the San Francisco Bay Area was running an ad that offered the unit for $389, which is much closer to what it’s worth. Unfortunately, the list price is $698, so there’s still a lot of room for pricing differences. Given the increasing popularity of these cameras, however, the prices likely to continue dropping as volume picks up. So shop around.

I asked the sales reps at my local outlet if they’d been selling many XapShots. “Sure have,” came the reply. It seems that real estate agents have discovered that the XapShot is the perfect substitute for a Polaroid camera. Especially real estate agents who have Macintoshes and want to import the pictures into their desktop publishing. Which brings me to using the thing in real life.

OK, you’ve got this nifty little camera that stores pictures on 2-inch floppy disks. Big deal—your Mac doesn’t have 2-inch disk drives. True. And here’s the biggest problem with the XapShot and its cousin, the Sony Mavica: Even though images are stored on disks, the information being stored isn’t digital—it’s analog! That’s right, what these cameras do is store a television image (NTSC video is analog), not a string of bits. That means that you must employ the camera as a playback device or use one of the accessory playback devices to see your results, and those results are like any video signal. And, as you know, the Macintosh can’t input raw video signals.

Fortunately, there’s activity in the Mac video area. And as we’re trying to put together a simple modest-resolution picturing system, you won’t have to go out and buy one of those $5,000 do-all video-frame grabbers. No, even the simplest frame grabber will work for our purposes. If you already have a video board in your Mac II, my suggestion is to use Digital Vision’s ComputerEyes line.
**You Can Have Fun. Or Get It Done.**

The Radius Pivot is a beautifully tooled piece of equipment. It's sexy in design. And it's fun to play with—twisting the screen into a portrait or landscape orientation. But ask yourself, are you buying it for fashion or for productivity? If it's productivity, you owe it to yourself to compare the Pivot to our PixelView II display. Let's compare:

**Which Works With A Macintosh Plus, SE, SE30 or II?**

Our PixelView II works with the Macintosh Plus, SE, SE30, and any Macintosh II. The Pivot does too, but the pivot feature (that you pay so dearly for), doesn't work on the Macintosh Plus or SE.

**Which Saves You 47%?**

Unlike Radius, you can purchase your PixelView display system direct from the factory. That means savings. No middleman. No retail mark-up. That's why you pay 47% less for our PixelView II.

**Now You Have A Lot Of Good Reasons To Pay Less!**

Let's face it, you buy a large screen display to improve your productivity. A quick comparison will reveal that our PixelView display offers more productivity for your money.

**Which Gives You Extra Viewing Area?**

The Pivot's 15" monitor has 30% less screen than our PixelView II 19" display. You pay $18 per sq. in. of viewing area with Radius compared to $5 with PixelView II.

**Which Gives You WYSIWYG Scaling?**

The PixelView II maintains true WYSIWYG scale so that what you see on screen is what you see on the printed page. Everything is shrunk down on the Pivot's 15" screen.

**Which Saves You Desk Space?**

One of the benefits of the Radius Pivot is that it's supposed to take less desk space. But the Pivot actually takes more space than our 19" PixelView II monitor just to pivot. 20" to be exact. And forget about leaning anything up against it.

**Compare For Yourself!**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Radius</th>
<th>PixelView II</th>
<th>PixelView I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen size</td>
<td>15&quot;</td>
<td>19&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>Viewing area</td>
<td>90.77</td>
<td>151.58</td>
<td>90.77</td>
</tr>
<tr>
<td>(sq. in.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical refresh</td>
<td>69</td>
<td>78</td>
<td>75</td>
</tr>
<tr>
<td>Pop-up Menus</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tear-off Menus</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Enlarged Cursor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enlarged Menubar</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Screen Saver</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Screen Copy</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full year warranty</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dealer markup</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**List Price**

<table>
<thead>
<tr>
<th></th>
<th>$1690</th>
<th>$897</th>
<th>$567</th>
</tr>
</thead>
</table>

"Try one for 30 days, if you don't love it...I want it back. We ship 95% of our orders within 24 hours, so you'll be saving money and time."

Ronald Eibensteiner, President/CEO

Call Today! Order Factory-Direct.

1-800-654-5294

Please circle 109 on reader service card.
of digitizers. I've seen the black-and-white version for as little as $249 (list $299) and the color one for just $150 more. They work perfectly well in getting XapShot images into the computer, where you want them, and come with pretty decent image-processing software.

Personally, however, I've been using a somewhat higher-priced setup. RasterOps has just introduced its 364 video board, which, besides replacing an Apple display board, gives you 24-bit-color capabilities and the ability to watch and capture video images in Macintosh document windows. Several other boards of this type are available on the market too. If Apple is truly interested in being a player in multimedia, it needs to build the equivalent of these boards into every Mac. Like the ComputerEye digitizers, the RasterOps 364 board comes with excellent image-capturing software. If you want to play Rembrandt and touch up your images pixel by pixel, I recommend Adobe's Photoshop. I captured all the photos accompanying this article with the 364 board, however, and did no additional work on them — I accepted the default chroma, hue, saturation, white-level, black-level, brightness, and contrast values so that you could see the pictures in their basic state. With some work, you could make each of these images look better. Also note that the graininess of the photographs is more due to the limitations of the 364's digitizing resolution than to any limitation of the camera — with a higher-resolution digitizer, I could have gotten better results. I find the 364's resolution acceptable as it is for casual work, however.

So let's see how to get those video images into the desktop-publishing files:

1. Take the pictures with the XapShot.
2. Plug the XapShot into the RasterOps 364 board (actually, I leave my battery-charger station plugged in to the 364 all the time, so all I have to do when I bring the XapShot home is pull out the battery, put it into the charger, and plug the charger's power and video cord into the camera).
3. Start up the RasterOps imaging software, and use the XapShot's controls to play the photo you want to capture.
4. Capture the image.
5. Manipulate the image by cropping it, modifying the color values, and so on — if necessary.
6. Save the image.
7. Start up your desktop-publishing program.
8. Import; place; and, if necessary, crop the image.

There are drawbacks to this system, however:

• Resolution is not as good as high-quality film-based photography, even if you use a better digitizer than I did.
• You still need to perform some manipulations on the captured image to get the best possible quality. Printing the resulting document can be a hassle if you're into color or high-resolution devices such as the Linotron.
• The RasterOps 364 board captures the image in only two sizes. (The images accompanying this article are shown at the smaller size. The larger size is basically 640 x 480 pixels.) This limitation is true of many digitizers.
• The colors are good, but they never show the kind of saturation a good slide film such as Kodachrome does.
• You're stuck with a single, normal lens, and you can't vary perspective.

But there are many pluses as well:

• There's no waiting for film processing, and you don't have to pay its attendant costs (a 2-inch floppy costs about the same as a roll of film with processing does, but you can reuse the floppy).
• Image input is a lot easier and can be instantaneous with the RasterOps 364 board: the necessary hardware is cheaper than a good scanner.
• Moreover, there's something unique about shooting video stills. Maybe it's just the newness of the tool and the weird, flat shape of the camera, but I find myself shooting stills differently from the way I do with my 35mm equipment. And I find I'm more likely to take the XapShot with me everywhere I go than to take my professional-caliber film equipment.

One last suggestion: Many of you might find yourselves frustrated by the XapShot's single, fixed-focus-length lens and lack of controls. Canon makes other high-quality 8mm video recorders, although I don't recommend them, because they're overpriced and underpowered. A nifty alternative is to use an 8mm video camcorder instead. There are a couple of caveats here, which I'll get to in a minute, but the prime advantages are that you end up with an almost unlimited number of stills, a zoom lens, control over shutter speeds, controls for balancing color images properly, the ability to annotate your shooting via the microphone, higher resolution abilities if you pick the Hi8 format instead of regular 8mm, and much more.
SuperLaserSpool™ makes “Waiting for LaserWriter” a thing of the past, and lets everyone get back to work immediately. Because it takes care of printing in the background, while you take care of business in the foreground.

SuperLaserSpool comes complete with the LaserQueue® desk accessory for efficient document handling—to prioritize or redirect documents to other printers. It includes document preview, and notifies users when print jobs are complete. Plus SuperLaserSpool works with just about any printer your Mac can drive. It also supports virtually all Macintosh® applications, including PageMaker.®

No wonder it’s the single most popular spooling utility available for Macintosh.

So go to your nearest dealer and pick up a copy of SuperLaserSpool. Or an economical five-pack. Then get back to work. Immediately.

SuperLaserSpool is now published by Fifth Generation Systems. Call 1-800-873-4384 for further details.
**Network Backup for Geniuses**

The creative geniuses on your network are too busy creating to worry about backing up. And their hard disks are filling up fast.

You need a centralized backup and archiving system.

A backup of every hard disk on the network. And a storage vault for inactive files. Retrospect Remote software turns any tape, cartridge, or optical drive into a network storage device. And it can be fully automated. So you and your network geniuses will be free to create. **Retrospect Remote:** Automated backup and archiving for the geniuses on your network.

**For More Information**

CALL: (415) 849-0293  FAX: (415) 849-1708

Please circle 138 on reader service card.

---

**THE EXPERT’S EDGE**

I expect to see more newsletters and reports with photographs in the future, you hear? Give your copies of Illustrator and FreeHand a rest for a few months.

The caveats: You’ve got to learn to shoot still video, which means that you don’t move the camera and you don’t shoot moving subjects, where possible. Use a high shutter speed so that action is stopped completely. Make sure you wait for the auto-focus to settle in (or turn it off, and focus manually) before you turn off the recording. You must test the camera’s ability to still-frame without jitter — preferably before you get into that need-to-shoot situation. Plan to spend some time trying to find the still frame you want to capture, as you’re likely to be searching through as much as 120 minutes of tape. (Hint: Use short tapes, and use the audio track to pinpoint the actual shots.) The ability to still-frame without jitter is probably the biggest requirement of a video camcorder, if you want to use its images in your desktop publishing. And not all camcorders are equal in this respect, so test before buying.

There you have it. I expect to see more newsletters and reports with photographs in the future, you hear? Give your copies of Illustrator and FreeHand a rest for a few months. Go ahead. Trying something new is the way we learn and grow. Meanwhile, all you film-based photographers have probably read to the end of this column: shrugged your shoulders; and said, “So what?” Well, for you celluloid junkies, I’ve been looking at a few tricks that might just get your photographs into the desktop-publishing world yet. You’ll still need a digitizer, so go back and read my comments about the RasterOps 364 board and the Computer-Eyes digitizers a little more carefully. And then hold your breath. Part 2 of this article will be along soon.

As you read this, Thom Hogan is likely to be found hauling too many pounds of still-video and film equipment across the Galapagos Islands in search of wildlife (note: not Wild Life, but wildlife). We assume the Ecuadorian government will let him return to author future Expert’s Edge columns.

---

**ColorSnap 32+**

Get real!

**Real time video image capture for the real world.**

$995.00

Most of the real world does not fit in a scanner. And, your time is precious. Use ColorSnap32+™ to immediately acquire a high quality image from any video source: live camera, still video camera, laserdisc or VCR. ColorSnap 32+ is REAL TIME and captures images with crisp, stop-action clarity and professional quality. Save files in PICT or TIFF; export them to image processing or page layout programs, or create your own image databases. Built-in modules capture images directly into Adobe's Photoshop™ or Letraser's Color Studio™. Also capture and attach stereo sound to your images with the Audio Option (hardware and software), and use the Compression Option (software) to dramatically reduce the size of your image files.

ColorSnap 32+: $995 and available now! Call us at (503) 626-2291 for details.

ColorSnap 32+ can be bundled with still video cameras from Canon, Sony or Panasonic. Call us for pricing.

For use with the Macintosh™ II family of computers.

**Computer Friends, Inc.**

14260 N.W. Science Park Drive
Portland, OR 97229
(503) 626-2291  Fax (503) 643-5379

Images courtesy of Sony Corp. Still Video Division

Please circle 64 on reader service card.
### Portable

40MB Portable's sleek design, reliability and low cost is for the user who knows what value is.

- Portable 40MB $299
- BackPac 40MB to 80MB from $369

### Traditional

Offers all the premium features such as two surge-protected AC outlets, a noiseless fan, a SCSI select switch and others too numerous to mention. Select the drive other hard disk manufacturers copy.

- 40MB to 200MB Direct Drive from $369

### Removable

Add another cartridge when you need more storage. And because our DriveWare software locates and locks out all bad sectors, you don’t lose important data.

- The Jasmine 45 Removable (SyQuest) $599

### LocalLink

LocalLink is a super fast, 100% Appleshare 2.0 compatible file server. LocalLink’s proprietary software enables the network manager to assign users, passwords and privileges. LocalLink is as fast as a firewall.

- From 130MB to 1.2GB

### Bundles

A lot to choose from:

- Two awarding utility software packages:
  - Sum II and Virex
- Memory: one meg sims-70 NS

A Drive For All Reasons

*Jasmine*

Now a Division of Chess

To Order With Your Visa or MasterCard in the USA, Call:

1-800-347-3228

Jasmine Europe Parc Club - 32 Jean Rostand 91403
Orsay Cedex France
Tel: 33 1 60 19 25 05 Fax: 33 1 60 19 10 32

©1990 Jasmine Technologies, Inc. 1225 Elko Drive, Sunnyvale, California 94089. Featured products and pricing are valid in the 50 United States. For international inquiries call (408) 752-2900 or fax (408) 752-2916. Jasmine, DirectDrive and DriveWare are registered trademarks of Jasmine Technologies. All other trademarks are of their respective manufacturers.

Please circle 199 on reader service card.
Microtech International.

Along with Apple, we've listened to your demands for new products. That's why we continue to develop products that keep pace with the latest technology, including the new Macintosh Classic, LC and IIsi. For these new computers, we have developed upgrade solutions that allow dozens of economical memory and storage options with strict adherence to Apple specifications.

Quality upgrades with more value.

Upgrade your new Mac with Microtech products that fit your needs. Add muscle with a new, high speed Europa™ internal Classic drive of 20, 50, or 100MB, or a Europa external drive of 20, 40, 80 or 100MB. The Europa Series is the perfect upgrade solution — built for economy without sacrificing quality.

Pump up the performance of your Mac with one of our new Eu™ memory boards. Our 1MB board offers the flexibility of SIMM expansion. And if System 7.0 is in your future, our unique 3MB solution is a must.

For the convenience and portability of removable media, our R50, utilizing the reliable Ricoh mechanism, offers speed, flexibility and unlimited storage capacity.

The Microtech name means quality.

For over 5 years, Microtech International has been setting the precedence in quality, service and support. Because we know what quality means to you — a product you can depend on, service you can rely on. Microtech products are backed by the longest warranties in the industry, and our service and support team, accessible toll-free, are winners of Macworld Magazine Service Hero Awards. Microtech also has an outstanding record for repairs in 48 hours or less, and our MicroLink BBS is available 24 hours a day.

So for quality, value, service and support in new Macintosh products, there really is only one other name you need to know... Microtech International.

1-800-325-1895

International inquiries call: 203-468-6223 (FAX 203-467-8124)

Please circle 127 on reader service card.
Binary Browser

Last November, we introduced a file browser, Text Browser, that extended our generic application shell to display the contents of a file. Text Browser uses TextEdit, the Macintosh text-display manager, to display the file, which makes it ideal for text-only files but not so hot for binary ones. Text Browser has two major faults: It ignores a file’s resource fork, and because of TextEdit’s built-in limitations, it can display only small files.

This month, we’ll take a second pass at our file browser by creating Byte Browser, which overcomes the shortcomings of its predecessor. Along the way, we’ll discuss resources, binary-data display, and the operation of Browser’s Window menu.

The most obvious difference between Text Browser and Byte Browser is in their displays. Figure 1 shows how each of the programs displays the same file.

Other differences between the two Browsers lie beneath the surface.

One File: Two Forks

Macintosh files have two parts, called forks (see Figure 2). In fact, a Macintosh file is actually two files in one. The data fork contains application-specific data, and the resource fork contains formatted resources.

The format of a file’s data fork is defined by an application’s developers. Some file formats, such as the SYLK file format, are a matter of public record, but most are closely guarded secrets. On the other hand, the content of a file’s resource fork follows an Apple-specified format. The resource fork contains resources, such as font bit-map data, a dialog-box template, or — if the file is an application — the application’s code segments.

The Macintosh Resource Manager provides a structured programming interface to a file’s resource fork. The Resource Manager is actually a small database manager, and the format of a resource fork is designed to facilitate speedy access to a resource. The Resource Manager’s routines retrieve an individual resource through its resource specification, which consists of a four-character key called the resource type, and a resource number.

The resource type is defined as a packed array of four characters and is specified in THINK C as a string between single quotes, as in ‘ALRT’.

The resource number is a signed integer, used to uniquely identify resources of the same type. It also has an intrinsic meaning: Negative resource numbers indicate system resources, and positive values greater than 127 indicate application resources.

Accessing the Resource Fork

Text Browser is severely limited in its ability to view files; in fact, Text Browser shows you only part of the file — the data fork. Byte Browser can read both the resource and the data forks. Because a file’s resource fork can be very large, Byte Browser’s buffer-management scheme differs from its predecessor’s. The size of the file that Text Browser can read is limited by TextEdit’s maximum buffer size, but Byte Browser can...
display a file of any size. This is important, because a file’s resource data is typically much larger than its nonresource content.

Normally an application reads a file’s resource fork by using Resource Manager routines such as GetResource. But because Byte Browser is interested in a file’s content strictly as data and not as resource templates, it reads the resource fork by using the File Manager routine FSRead. FSRead can actually read the data fork, the resource fork, or both—Text Browser uses it to read the data fork. Which fork it reads depends on how the file is opened.

Text Browser uses FSOpen to open the data fork, and Byte Browser uses OpenRF to open the file’s resource fork. Both File Manager routines return file-reference numbers, but the numbers are different for the two forks.

The Binary Display

Byte Browser displays 256 bytes at a time, consisting of 16 lines of 3 columns. It also displays a file header at the top of the screen. In the far-left column of the window, Byte Browser displays the current file offset, relative to the beginning of the file. Then it displays the file’s data twice: In the center, bytes are displayed in hexadecimal format, 16 characters to a line; on the right, the line is repeated in ASCII form, with nonprintable characters displayed as dots.

Byte Browser’s update routine calls the display routine, drawByteIF(), which is in Display.c. Example 1 shows an excerpt from drawByteIF().

drawByteIF() constructs three buffers—offsetbuf, hexbuf, and asciibuf—from the file data for each line of the display, and it uses the C library function sprintf() to format the buffers. Each line is drawn in three parts from the string components of these three buffers, and each line is constructed separately, controlled by an outer loop.

drawByteIF() creates the line’s offset string in one shot. The hex and ASCII buffers, however, are created character by character. Within the inner character loop, it builds a temporary buffer with the current character and uses strcat() to concatenate the temporary buffer to hexbuf and asciibuf. drawByteIF() uses isprint() to check that each character is a printable ASCII character and substitutes a dot in the output string for characters that fail this test.

It is natural to manipulate the line buffers as C strings, because of the wealth of string functions in the C standard library. From the char offsets in the offsetbuf, it builds the offset string for the current line and uses sprintf() to format it in hexadecimal.
This is your hard disk severely fragmented

This is how a typical fragmented hard disk looks. The abuse fragmentation can deal is a crime, and it's causing a national epidemic in offices everywhere. But the more you use your computer, the more your files are spread all over your hard disk. As a result, your disk has to work a whole lot harder than it has to. And increased head movement not only slows down your file access times, it will slow you down, too.

This is your hard disk defragmented

Even defragmentation software can't help much. Wimpy defraggers just place pieces of individual files adjacent to each other. Defraggers just don't have the intelligence to constantly monitor your file usage. So, any increases in performance are modest and only temporary, disappearing as soon as you use your computer again.

This is your hard disk with DiskExpress II

Only DiskExpress II has revolutionary Disk Optimatic™ technology designed to safely keep your disk optimized forever. And only DiskExpress II has the intelligence to work transparently while you work, the way you work. Which means only DiskExpress II can monitor your daily file activity and determine the absolute optimum priority for file placement on your particular computer. Frequently used files are placed first, then free space and then seldom used files at the back of your disk where they belong. That not only minimizes head movement, it delivers the kind of mind-boggling increase in speed and performance you could get hooked on and be better off for it. To order your new DiskExpress II 2.04, call ALSof today.

Any Questions?

Purchase specially marked packages of DiskExpress II now and get MultiDisk hard disk partitioning program included FREE while they last.

DiskExpress™ II
Disk Optimizing
$89.95

MultiDisk™
Disk Partitioning
$89.95

MasterJuggler™
Resource Optimizer
$89.95

ALSoft, Inc.
P. O. Box 927 • Spring TX 77383-0927
713/353-4090 SALES • 713/353-9868 FAX

Please circle 71 on reader service card.
Have 12 monthly issues of the ultimate resource for Macintosh users delivered right to your door at an unbelievably low price.

- One year (12 issues) for $19.97. Save 44%.
- Two years (24 issues) for $35.40. Save 50%.

Plus, with your paid order you’ll receive a very special bonus! It’s our exciting pop-up, power-tip resource—1,001 Hints & Tips Disk for the Macintosh—FREE!

Call toll-free to place your order.
1-800-627-2247

Savings based on annual newsstand price of $35.40. Add $8 per year for postage to Canada and all other countries outside the U.S. U.S. currency only. Please allow 30 to 60 days for delivery of first issue. Your disk will be shipped upon payment.

Figure 2: Almost all Macintosh files are made up of two distinct parts: the resource fork and the data fork.

Making a SPLAsh

The Symantec Programming Languages Association — SPLAsh for short — is a new programmers’ group targeted at users of Symantec’s languages. Greg Dow, developer of the THINK C class library and founder of SPLAsh, writes in the first issue of the group’s journal, THINKin’ Cap, “SPLAsh’s goals are to provide pertinent and practical information for THINK programmers. Programming the Mac is hard enough without having to figure everything out by yourself. SPLAsh can provide meaningful and usable source-code examples as well as address issues relating directly to the development environments.”

We agree with Greg. It’s always good to see how someone else solved a problem you’ve been struggling with. The SPLAsh journal and code samples seem to provide another good opportunity to gain wisdom by example.

SPLAsh’s annual membership costs $30 and includes quarterly issues of THINKin’ Cap, a source-code disk, notices of SPLAsh meetings, and access to the organization through electronic information services. You can obtain more information about SPLAsh membership from SPLAsh Resources, 1076 Shattuck Avenue, #302, Berkeley, CA 94709.
We're already the biggest.
We're already the best.
We've already got more members.
We already offer more services.
So we decided to make some improvements.

Isn't that just like us? Never satisfied. Even though CompuServe is already the biggest computer information service in the world, we're still full of surprises.

Like the CompuServe Information Manager software that revolutionizes the CompuServe experience for Mac users. Now, you can do things like utilize a powerful Macintosh interface, compose letters, and read retrieved Mac support material offline.

All this for only $39.95*, including software and a $25 usage credit. Usage charges are as low as 10¢ a minute.

And it's not only exciting, and breakthrough, and revolutionary, it's easy to order, too. If you're already a CompuServe member, just type GO ORDER. If not, see your computer dealer, or call us today.

The new CompuServe. Now including CompuServe Information Manager software for the Mac.

CompuServe
800 848-8199

Requirements for Mac version of CompuServe: Mac Plus or later model Macintosh with at least one megabyte of RAM, Mac System 6 or later version; hard disk, one 800K (or higher) floppy drive. Hayes compatible modem recommended.

*Suggested retail price.

Please circle 120 on reader service card.
Example 1: Byte Browser’s Display Routine

```c
/* drawByteIF - draws a byte document at the current scroll 9.20.90kwgm */
static void drawByteIF (theDoc)
    DocPtr theDoc;
{
    register char *p;
    register short v, line, i, c;
    short lineHeight, hOffset, hHex, hAscii;
    Size fileOffset, fileSize;
    char hexBuf [64], asciiBuf [64],
        offsetBuf [16], tmpBuf [24];
    FontInfo finfo;
    Handle fileBufHdl;

    fileOffset = theDoc->fileOffset;
    fileSize = theDoc->fileSize;

    if (fileBufHdl = theDoc->contentHdl)
    {
        HLock (fileBufHdl); /* we will move memory here */
        p = *fileBufHdl; /* pointer to file data */
        printBrowserHdr (theDoc); /* print a file header */
        GetFontInfo (&finfo);
        lineHeight = finfo.ascent + finfo.descent + finfo.leading;
        v = lineHeight * 3; /* leave a space at top of screen */

        /* print the file data a line at a time */
        for (line = 1; line <= 16; line++)
            { /* build file offset string and increment */
                sprintf (offsetbuf, "%051X ", fileOffset);
                fileOffset += 16;

                /* build hex and ascii strings, a character at a time */
                hexBuf [0] = Ox00;
                asciiBuf [0] = Ox00;
                for (i = 0; i < 16; i++)
                    { if (i + fileOffset < fileSize)
                        c = *p++ & OxFF; /* mask upper byte */
                    else
                        c = 255; /* print box char after EOF */

                        sprintf (tmpBuf, "%02X ", c); /* do hex format */
                        strcat (hexBuf, tmpBuf); /* add to hex string */
                        /* ascii format ... */
                        strcat (asciiBuf, tmpBuf); /* add to ascii string */
                    }
            }

        /* draw a line */
        MoveTo (kLeftMargin + theDoc->curScroll.h, v);
        CtoPstr (offsetbuf);
        DrawString (offsetbuf);

        Move (finfo.widMax << 1, 0);
        CtoPstr (hexBuf);
        DrawString (hexBuf);

        Move (finfo.widMax << 1, 0);
        CtoPstr (asciiBuf);
        DrawString (asciiBuf);

        /* double-space for next line */
        v += lineHeight + finfo.leading * 2;
    }

    HUnlock (fileBufHdl);
}

/* drawByteIF */
```
MANAGING YOUR MONEY...
NO OTHER PROGRAM
DOES MORE FOR YOUR MONEY.

Managing Your Money® is the most comprehensive, easy to use money management program available on the Macintosh™! Fully integrated and updated for the new tax laws, MYM Mac is everything you'll ever need to master your personal or small business finances:

- CHECK WRITING AND BUDGETING
- TAX PLANNING
- INSURANCE PLANNING
- FINANCIAL PLANNING
- PORTFOLIO MANAGER
- NET WORTH

And there's more:

- POWERFUL SMALL BUSINESS FEATURES
- EXTENSIVE GRAPHICS & REPORTING
- EXPORTS TO EXCEL® AND MACINTAX®
- NOT COPY PROTECTED

Let Andrew Tobias become your financial advisor and find out why year after year, Managing Your Money is rated the outstanding program in its class.

"...Managing Your Money is the Mercedes of personal finance programs."
— Macweek, 9/13/88

Managing Your Money is the Mertedes of personal finance programs.
Example 2: Open-Document-List Data Structures

typedef struct DocInfo {
    DocPtr theDoc;
    short menuItem, slotNumber;
} DocInfo, *DocInfoPtr, **DocInfoHdl;

typedef struct DocList {
    short count;
    DocInfo docInfo [ ];
} DocList, *DocListPtr, **DocListHdl;

window, builds the menu string, and inserts the document’s name into the Window menu.

toDocList() allocates space for the new DocInfo record by “growing the handle,” which doesn’t change
the handle per se but allocates more memory for the structure to which the handle refers. It then initializes the new
DocInfo record by assigning the slot number; the pointer to the document, DocPtr; and the menu item of the
document.

The DocInfo record and the document are doubly linked with data — the
DocInfo record contains the pointer to
the document, DocPtr, and the Doc
structure contains the array index of the
DocInfo record. This double link is
necessary so that Byte Browser can get to
the data starting from either the Doc
structure or the open-document list. For
example, when you select a document from the Window menu, Byte Browser extracts DocPtr from the DocInfo
structure and then passes it to
SelectWindow. When you close the
window, Byte Browser deletes the
DocInfo structure from the document
list. It maintains the array index in the
index member of the Doc structure.

Removing Documents

When you close a document, Byte Browser calls removeFromDocList().
This routine uses the index value to
address the DocInfo data. It deletes the
menu item from the Window menu with
DelMenuItem, clears the document’s
slot-number bit (in aCmdKeyMap, the
variable that holds the map of available
keyboard command equivalents), and
removes the DocInfo data from the
open-document list.

The deletion of both a menu item and
aDocInfo record causes some data mis-
alignment, because the menuRecord
and DocList structures are arrays of
contiguous elements. Each DocInfo
record contains a menu-item number that
refers to its document. When the menu
item is deleted, some of the item numbers
stored in the open-document list are off
by 1. Likewise, the values stored in a
document’s index field that refer to ele-
ments of the DocInfo array above the
deleted element are also off by 1.

removeFromDocList() fixes these
two misalignments on records that have
menu-item numbers and indexes greater
than those of the deleted record, but it
does not change array elements whose
index values are less than that of the
deleted record.

The Complete Browser

You really have to look at the code in
DocList.c to fully understand the last
paragraph, but we don’t have room to
print it here. Byte Browser is supplied as
a complete THINK C project. You’ll find
this month’s source code on Zmac; those
without a modem can get a disk contain-
ing the code by sending a check for $10
made out to Kurt Matthies to 1150
Hancock Drive, Boulder, CO 80303.

Programmers Page

Products for programmers. Especially designed for POWER USERS this page features advertisements of the products and tools programmers and developers demand.

So before you dig into the Thom Hogan and Kurt Matthies monthly installment of programming tips and tutorials, look over the Programmers page for the latest tools available to you.

For advertising information phone 1-800-825-4237.

FORTRAN is NOT just for Engineers

Do you...

✓ want correct answers and fast computation without hassles?
✓ wish that a simple Macintosh application required only 2 lines of code and created an editing window that supported printing and desk accessories?
✓ dream of automatic backgrounding without making toolbox calls?

If you answered YES to any of these questions, consider using Language Systems FORTRAN, the leading VAX-compatible FORTRAN on the Macintosh. Language Systems FORTRAN provides a state-of-the-art development environment that runs FAST.

Sound interesting? Call or write for additional information.

Language Systems
441 Carlisle Drive, Herndon, VA 22070
703/478-0181 Fax: 703/489-0993

CIRCLE 317 ON READER SERVICE CARD
Introducing the Kodak Diconix M150 plus printer. It travels with any portable or desktop Mac computer, so you can print anytime, anywhere.

Just think of all the things you can do if you carry a Diconix printer with your Macintosh computer. Those last-minute improvements on the presentation. The letters and reports that could be on their way right now. And, because it's so small and quiet, it works as well on the desktop as it does on the road.

It’s all easy with the new Kodak Diconix M150 plus printer. It’s easy to carry (3.1 lbs.), prints PostScript-quality outline fonts using Adobe Type Manager™ software, as well as presentation graphics. No printer in the world is quieter, smaller or lighter.

Go ahead, give in to temptation, call for the name of your nearest dealer in the U.S. or Canada: 1 800 344-0006.
Do you have an undocumented Macintosh tip you're willing to share? MacUser pays at least $25 for every tip used, and the Tip of the Month earns $100.

Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via Zmac, the on-line service for MacUser. Send them to Gregory Wasson at 72511.36. Be sure to include your full name and mailing address along with the text of the tip.

Compiled by Gregory Wasson

Tip of the Month

Spot-Color Proofs

The advent of color electronic page makeup has highlighted a problem that most software manufacturers have overlooked. The problem occurs when you print a spot-color composite to a low-resolution (300-dpi) black-and-white printer for proofing. If you compose a document using spot-color components from a page-makeup program such as PageMaker or QuarkXPress and place color graphics from Illustrator 88 or FreeHand, the printer driver assigns a percentage of black to represent the differences between colors. This is fine for proofing a color break, but it makes copy-on-the-page (and within graphics) very difficult to read. QuarkXPress offers the option of printing colors as grays or in black-and-white, but this option has no effect on color EPS files placed on the page.

Solution: Tell the printer to use a screen ruling too high for it to reproduce (150 lines per inch, for example, for a LaserWriter or other 300-dpi device). When the page comes out of the printer, the tinted areas fill in to black (see Figure 1). To achieve this effect in QuarkXPress, simply set the screen ruling in the Page Setup dialog box to the desired value.

The process is more involved for PageMaker. You must open the APD (Adobe printer description) file for the appropriate printer and edit it with a word processor. Remember to save the APD file as a text file under a different name (LW II NTX composite.apd, for example) so the original remains unchanged. You need to locate the lines listed below and change the screen-frequency values indicated in bold to the appropriate values:

```
@DefaultScreenFreq: "150"
@DefaultScreenAngle: "45"
@DefaultScreenProc: "(dup mul exch dup mul add sqrt 1 exch sub)"
@ScreenFreq: "150"
@ScreenAngle: "" 
@ScreenProc: "" 
```

Remember, this procedure turns almost every percentage tint in a document to solid black, so it doesn't work in situations involving background tints, process color photos, or tint builds.

Steve Zengen
Buffalo, NY

Figure 1: Proofing color material with tinted text on 300-dpi printer output can strain the eyes, as shown by the top example. But a simple trick in setting the line resolution can bring things into focus.
TOP 10 REASONS

Z88 Laptop Computer is Mac Owners’ Most Popular Portable

1. Weighs Under Two Pounds, Lightweight and Compact
2. Notebook Dimensions: Same Size as this Page, Less Than 1 Inch Thick
3. 20 Hours Use on 4 AA Batteries
4. Built-in Software for Word-processing and Spreadsheets
5. Up to 2 Mb Memory
6. Easily Transfers Files to and from Macs
7. Silent, Spill-proof Keyboard
8. Task Switching
9. Instant On: Everything is where you left it
10. Toll-free Technical Support

From $439
Call 800-441-2780
Order direct from Cambridge Group
200 Stonehinge Lane • Carie Place NY 11514
The Only Authorized Dealer

MONEY BACK GUARANTEE
Please circle 105 on reader service card.

The Copy macro, which I call Library Paste, is especially handy for selecting items from a long general list (such as a large bibliography) for inclusion on a specialized list. The Cut macro, which I’ve named Gather, is useful for collecting and moving material in a document. As a companion to the Gather macro, you might want to create a fourth macro, Spill, that places the newly assembled information in your document at the desired insertion point and empties the fake Clipboard. Before beginning to record the macro, click on the insertion point and select Untitled from the Window menu; press the command that selects all in the application, press Command-X, select your original document, and press Command-V.

Megan B. McClard
Denver, CO

Apple File Exchange

Occasionally the Desktop file on a floppy disk will become damaged so that it can’t be rebuilt in the usual way. You can tell that the file is damaged when there is a long pause after you insert the disk into the drive, followed by an alert dialog box that says the disk needs minor repairs and asks if you want to repair it. If you click on OK to repair the disk, however, the head shuffles around a bit and the disk is ejected without being read.

A member of our faculty had this problem with a very important document disk that, of course, had no backup. Several disk-recovery utilities were used without success. I managed to retrieve all the files, not with an expensive recovery application but with an application, AFE (Apple File Exchange), that comes free with the System software (see Figure 2).

I booted AFE, hoping that it would be able to read the files even though the Desktop file had been trashed. The entire file list appeared, and I was able to transfer all the files safely off the damaged disk. Other programs could probably do the same, but AFE is fast and efficient—and the price is right!

Bruce A. Carter
Boise, ID

Word 4.0

Do you want to sort a mail-merge data file by zip code when the first field is LASTNAME and ZIPCODE is somewhere in the middle of the record? You can try using Option-drag to select just the ZIPCODE column. You need to set your tabs so that all the zip codes are left-aligned in a column (see Figure 3). Hold down the Option key as you drag the mouse to highlight...
Figure 3: Word 4.0's Option-drag feature not only highlights columns of text but also helps you sort a document.

the desired column of text.

Once you’ve selected a column of text, using the Sort command sorts the records based on the first word of each line in the selected column rather than on the first word of each paragraph in the data document. And remember not to select the field name at the top of the document.

Jungle Payne
Santa Barbara, CA

PageMaker 4.0

PageMaker 4.0 has enhanced exporting features for text, which can be a boon if you need to compress and save documents created in older versions of PageMaker. These documents are most likely large, and the formatted text sections are probably the most important part. If this is true, then translate the document created with PageMaker 3.0 or 3.02 up to version 4.0.

Now you can export the documents (you can combine them by cutting and pasting) into a document that’s formatted in your favorite word-processor style (or text only). This technique might save you 100K on small documents and as much as megabytes on large ones.

If you ever need your older document again, you’ll find that reassembly is easy. Other exporting programs can perform this trick as well, but PageMaker documents save you the largest amount of space when you remove the formatting.

David Smith
Georgetown, TX

Canvas 2.1

Macintosh users know about the problems with quality that can occur when MacDraw or similar graphics are pasted into other applications. Many things such as alignment and line weights go haywire when you print. If you own Canvas Separator, you may have a solution right under your nose.

1. Open the original graphic in Canvas.
2. Save the graphic in Canvas format.
3. Use Canvas Separator’s Convert command (see Figure 4) to convert the file into a suitable format, such as EPS.
PICT or EPS Illustrator.
4. Finally, import the file into your page-layout or word-processing package. More often than not, the problems will vanish.
Jeff Harris
Leesburg, VA

Mouse
Here's a low-tech way to transform your bulky mouse into a halfway decent tracing tool.

Let's say you want to draw something moderately difficult such as a map of Jamaica to include in a letter with directions to your estate in Spanish Town (don't you wish!).
1. Get a paper clip. (Mac tips don’t come much simpler than this.)
2. Bend the clip so that one end comes away from the rest at 90 degrees. Bend that point down 90 degrees.
3. Tape it to the top of your mouse.
4. Use the overhanging end of the paper clip to trace the map from an atlas or a map of a decent size. The mouse will "draw" along. The flatter the surface, the better. It takes a little practice, but it works and enables someone with no artistic flair to do a fairly creditable job.
Barry Lazar
Montreal, Quebec
Canada

Figure 4: Canvas Separator can help you export troublesome draw graphics into formats that mesh more successfully with page-layout programs.

Word 4.0
Most database programs can export to PageMaker (and other desktop-publishing programs), but formatting text with anything but paragraph-based styles is difficult. (For example, you might want one
The art of business.

Have you ever noticed the way your colleagues use graphics? How they seem to make their reports and presentations come alive?

Chances are, they are using MacDraw® II software, the most popular drawing tool for the Macintosh.

With MacDraw II you can illustrate reports, design products, publish flyers, and present proposals in a way that makes people sit up and take notice.

Even if you've never used a drawing tool before.

What's more, MacDraw II is advanced enough to keep you going even as you get better at using graphics. Its power and depth have made it a standard for corporations who need a tool that beginners can start with and expert designers can stay with.

And don't be surprised if you advance quickly, either. MacDraw II works like you think. So the feel is totally natural.

But why not see for yourself. Just ask a colleague to show you MacDraw II. Or stop by an authorized Claris dealer to find out how effective you can be at the art of business.
Last Year, She Had 2.8 Million Heart Attacks.

She's called Resuscitation Annie. She's a teaching mannequin created to train millions of Americans in fighting heart attacks. It's just one of the many educational programs we started to help you control America's number one killer. And it's all helping.

Since 1977, death rates from heart attack have dropped by 30.9%. So keep up the good work. Quit smoking. Watch your diet. Monitor your blood pressure. And we'll keep on working to support scientific breakthroughs and medical innovations that help make hearts healthier.

To learn about reducing your risk, write the American Heart Association, 7320 Greenville Ave., Box 8, Dallas, TX 75231. And say hello to Annie if you see her.

Your Life Is In Your Hands.

American Heart Association
Enter a New Dimension in Color Graphics!

Here at Animas, our primary objective is to design innovative, easy-to-use products. From the first conceptual drawing to the finished product, our focus is always on quality. Take, for example, our Animas True-Color Hand Scanner. It's clearly the most revolutionary scanner on the market today at any price (just ask anyone who saw it at the MACWORLD Expo in Boston). And because we believe in promoting lower prices for the Macintosh masses, we are bringing it to you at the incredible price of $599.00! Look at the long list of features below:

**Features:**

- Animas True-Color Hand Scanner  
  (Scan Width 4.1 inches)  
- SCSI Interface with SCSI Cable  
- Color/Scan MacCheese Software  
  (Suggested Retail $149.00)  
- Automatic gamma correction  
- Read It! OCR Software by OLDUVAI Corp.  
  (Suggested Retail $295.00)  
- 100-400 DPI selectable in increments of  
  10 DPI in dithered mode  
- 200 DPI in halftone mode  
- 16.7 million colors  
- Scanning speed: 3.5 ms/line  

The only questions you should have now are:

How can they sell it at such a low price?

Where can I get one?!

![Animas Logo]

We know what's on your mind.
Phone: (800) 800-5885 • (714) 590-3334
Fax: (714) 590-1231
Please circle 418 on reader service card.
60% OF THE NATION'S TOP CEOs ADMIT THEY HAVE A DRUG PROBLEM.

CEOs at 30 of America's top 50 companies have acknowledged that they have drug problems within their organizations.

They have good reason for concern. Research shows that drug abuse severely cuts the productivity of more than one-sixth of the nation's workforce. So these executives have taken two important steps. First, they've made it corporate policy not to tolerate drug use, by anyone at any level of the company. Second, they're offering help to drug users by establishing employee education, assistance, and drug treatment referral programs.

If you feel it's time your company faced up to its drug problem, expert guidance is available to help you compare model drug programs, discuss legal questions, and educate your employees.

Please call the National Institute on Drug Abuse Workplace Helpline for CEOs and managers, 1-800-843-4971. From 9:00 a.m. to 8:00 p.m. eastern time Monday through Friday.

You'll be in good company.

PARTNERSHIP FOR A DRUG-FREE AMERICA
Join The Leaders Who Have Joined MacNetwork

Check this list of successful Macintosh vendors. They market actively, advertise intelligently, and continue to prosper by reaching the businesses that buy Macintosh.

How do they do it? The Ziff-Davis MacNetwork, which combines MacUser and MacWeek into one powerful network buy. These publications — each the leader in its category — cover the market and reach the buyers with immediate impact. Which explains why so many marketing stars have already joined to reap the benefits.

To efficiently reach the majority of vital Macintosh buyers, you need different vehicles aimed at different decision makers. And no system attracts brand specifiers and volume buyers as quickly or as efficiently as the weekly/monthly one two punch of the Ziff-Davis MacNetwork.

Check the benefits

By advertising in both, you benefit from a generous rate structure based on an attractive sliding scale of discounts: for frequency, plus Network coverage, plus Corporate discounts for achieving your goals in any Ziff-Davis publications.

Tailor the best program to your needs, and get substantial discounts in the process. Reach the decision makers. And find your name on the list of Macintosh leaders.

For more information, call David J. Ezequelle, Director (415) 378-5601
Peter Weedfald, Adv. Director (212) 503-3755

MacUser

MacWeek
PostScript Power To The People!
The QMS-PS® 410 Printer. Developed by the greatest minds in the industry. . . Yours.

Before engineering the QMS-PS 410, we performed one very important task. We listened. Then we took everything we heard, added a few surprises, and built a revolutionary laser printer with a suggested retail price of just $2795!

You said make it Adobe® PostScript®. So we did. And now you can enjoy the design flexibility only PostScript offers as well as 45 resident typefaces and thousands of PostScript software applications.

You said make it reliable. So we used the Canon® LX print engine manufactured by the undisputed world leader in high-quality, easy-maintenance print engines.

You said make setup easy. So we made it truly and completely plug-and-play. Out of the box, it connects to IBM® PC’s and compatibles, Apple® Macintoshes® and mini and mainframe computers.

You said make it flexible. So we added HP® LaserJet® Series II emulation to support non-PostScript printing applications.

You said make it simple. So we gave the QMS-PS 410 the intelligence to actually “think for you” by automatically switching between emulations and interfaces! This printer has ESP (Emulation Sensing Processor), which interprets incoming data and automatically chooses the appropriate printer language. And you can send data simultaneously to its AppleTalk®, serial and parallel interfaces! There’s no need to change switch settings or send complicated software commands.

You said make it fast. So we created a super-fast controller with a 68020 processor and third generation QMS® ASAP™ technology (Advanced Systems Architecture for PostScript), which incorporates the latest in component and controller design.

You said make it expandable. So we made a variety of options available, including an HP-GL® emulation card, Adobe typeface cards, HP compatible font cards, memory upgrades and extended paper handling capabilities.

Call Now and Let the QMS-PS 410 Liberate You!
1-800-523-2696

You see, listening to you gave us the insight to develop a printer that offers real world solutions to real world problems. And the QMS-PS 410 delivers PostScript power to the people by giving you more solutions than any other printer on the market. Affordable. Reliable. Flexible. Solutions that set you free!
**DOS on a Mac**

Q. What are the minimum additions (software and hardware) that I need for my system so that it can run programs created by DOS computers?

I have a 1987 standard Mac SE with 1 megabyte of RAM. I’d like to be able to run and modify some DOS programs such as dBASE III PLUS and Lotus 1-2-3 and their files.

John Dabbas
San Diego, CA

Bob: First, you need a program called SoftPC from Insignia Solutions. You have to upgrade to at least 2.5 megabytes of RAM to run it, but I recommend that you get a full 4 megabytes for the best results. That solves only half of your problem, though, because your SE doesn’t have the DOS-reading SuperDrive that’s standard equipment on all new Macs. Believe it or not, your SE is so antiquated that it lacks the SWIM chip that would enable it to use Apple’s new cheap external SuperDrive. However, you can get a 3.5-inch and/or 5.25-inch SCSI floppy drive called the DaynaFile from Dayna Communications (MacUser gave it five nines back in October ’89 — “PC to Mac and Back,” page 143) that will just work fine.

**Mac II in Stereo?**

Q. How can I get my Mac II to play stereo sounds? I’m using my Walkman headphones, and all I get is mono.

A. Z. Brabbit
Tampa, FL

Andy: The headphone jack at the back of your Mac II (dang . . . spoiled the rhyme) is indeed a stereo jack, and it will treat you to big-time stereo sound if your Mac recorded the sound in stereo. However, the Mac pumps out 99.999% of its sounds the easy way — in mono — so that’s how they’ll be played back.

Bob: Don’t give up, though. Apple seems to think that the added sound capabilities of its new Macs (and the increased functionality of the Sound Input Manager) might change the stereo status quo and let you record in stereo. So hang on to your headphones.

**What’s My Contour Line?**

Q. I’m looking for a program that can create topographical maps and let me zoom in and out and view them from any angle. I’ve got a llx, so I shouldn’t have a problem with number crunching. Any suggestions?

Paul W. Moore
Minot Air Force Base, ND

Andy: If you have a spreadsheet program with decent graphing capabilities, such as Wingz or Full Impact, you might not need a special program. If you have all the elevation data for the area, all you need to do is plug the data into a spreadsheet as a 2-D table and have the program create a 3-D surface graph from the data. You’ll be able to make all kinds of modifications — zoom in or out, rotate around the area, change the viewing angle — from the spreadsheet (see Figure 1).

Bob: Andy’s method is a good one if you’ve already shelled out for a spreadsheet program that can handle 3-D graphs, but I’ve got another, more sophisticated solution. RockWare, Inc., of Wheat Ridge, Colorado, has a $400 gridding, contouring, and base-map-plotting program called MacGRIDZ0 that might be exactly what you’re looking for. Call RockWare at (303) 423-5645 for more information.

Questions, anyone? Here’s where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. Andy Ihnatko isn’t. But he knows a lot about the Mac, and he’s got a heck of an attitude. Together, they’re ready to answer your questions about everything Macintosh.

Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Don’t want to wait for an answer? Post your question on Zmac, MacUser’s on-line service, and get a reply from Bob, Andy, or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

---

**Figure 1:** A 3-D map created from elevation data with Wingz. (Note: For best results, get Apple to lend you a llx before plotting stuff like this.)

**Vaccine Redundant?**

Q. I installed Vaccine I.0 on my hard disk to help guard against viruses. I also recently purchased Symantec’s SAM. Because it seemed a little more comprehensive. Is the old Vaccine now redundant and just taking up space?

Steve Jones
Jefferson City, MO

Bob: Yes, it’s redundant.

Andy: Not only that, but it also does the same thing as SAM.

**A Faster Plus**

Q. A dealer told me that an accelerator would speed up my Mac Plus, except for calculations (which don’t matter to me anyway). Another dealer said an accelerator wouldn’t help that much and could cause overheating. I do a fair amount of word processing and keep several large databases.

Ronald Hultine
Apple Valley, MN

Andy: Adding memory is never a bad idea, but it won’t make your pokey Plus run any faster. Buying an accelerator will (and that includes moving between applications). The wireheads at MacUser Labs, who live to answer these sorts of questions, reported in
Join Zmac
The on-line companion to MacUser and MacWEEK

Explore these areas on Zmac:
- Download Library of Editors' Top Shareware Picks
- Zmac Buyers Guide Database
- Technical Tips and Hints Database
- Editorial Discussion Forum

GO ZMAC and discover
Any CompuServe subscriber can access Zmac by typing GO ZMAC at the exclama-
tion point (!) prompt, type PHONES. Follow Instructions to locate access 
numbers in your area. Hang up.

Signing up for an account
Dial up using your local access number. When connected press RETURN.
You'll see the following prompts on-screen. Your responses are printed in bold.

August '90 (“Chasing the HFs: Accelerators,” page 84) that the Gemini Series by 
Total Systems ($1,895, without a floating-point coprocessor) was the best bet
for people such as you (and me) who appreciate the ZenLike simplicity (but not
the speed) of a good old-fashioned Plus. Call Total Systems at (800) 874-2288.
Bob: You say you’re keeping some large databases? In his zeal for Zen, Andy
forgotten to mention that database programs love extra memory even if it
doesn’t make your computer go any faster. That’s because keeping more data
in memory reduces the number of times your program has to access the hard
and all the world’s problems will be solved. In the meantime, you might consi-
der investing in a faster hard drive and some more memory.

Bite the Bullets
Q. Is there an easy way to generate filled-in bullets (*) without relying on a
special font set?
Bennett Egseth
Address Withheld
Andy: I’d better how to Bob’s superior technical savvy on this one!
Bob: OK, the answer to the question is trivial (Option-8 will get you a bullet in
almost any font), but I’ll also point out that there are a lot of useful Mac-type
graphic features that new users don’t know about or don’t understand how to
use (such as smart quotes, accents, and ellipses). These little touches set the Ma-
itrate writer apart. It’s kind of like knowing which fork to use at a dinner
party. I’ve run across a new book by Robin Williams that gathers all this lore
into one small, easily digested package called “The Mac Is Not a Typewriter”
(Peachpit Press, $9.95).

New Macs Unstable?
Q. When I traded my reliable SE for
my current IIci, I didn’t imagine the
trouble I was headed for. I knew many
games wouldn’t work, but I didn’t count
on the blasted instability of the thing.
Part of the problem was a virus (since
cradicated).
What I’m looking for is a concise list of
error- and bomb-code definitions. Any
suggestions?
R. Eggesman
Everett, WA
Bob: Macintosh guru and Pyra! co-
author Bill Steinberg wrote a DA called

System Errors DA that contains just what
you’re looking for (see Figure 2). You
can’t order it directly, but you can down-
load it from Zmac or from CompuServe’s
MAUG forum (where Bill’s a sysop).
I know what you mean about upgrading
to a new, state-of-the-art CPU. Apple
recently lent me an IIx, and although it’s
easily the best Mac I’ve ever used, I had
a couple of incompatibilities that were
nearly impossible to track down.
For example, when I first got the IIFs,
Word and PageMaker froze as soon as I
launched them. By trial and error, I dis-
covered that if I didn’t use Suitcase II,
they launched perfectly. I posted a note in
the Fifth Generation Systems Support
forum on CompuServe asking if anyone
else was having the same problem. No-
body was. I was stumped until Bill
Steinberg suggested I check all the files I
was opening with Suitcase — perhaps
one of them had become corrupted. Bingo.
It turned out that I had a corrupted font
file. After I replaced it from the locked
master disk, everything worked fine.
Don’t give up. Keep trying different
combinations of things — remove INTFs
or cdefs you think might be causing prob-
lems, call manufacturers if their products
aren’t working right, cry for help on
CompuServe or Zmac, or consult your
local user group. Once you’ve gotten
your IIci environment stabilized, I guar-
tee that you won’t miss your SE at all.
I used to have a plain-vanilla Mac II.
Now that the IIx has settled down, I
wouldn’t dream of going back to the old
Mac II.
Andy: Oh, cry me a river. Bob. Pakes
with 40-megahertz machines and 32 megs
of RAM deserve to suffer a lot. And
people who get those systems for free
deserve to suffer a lot.
You’re absolutely right about hunting

Please circle 400 on reader service card.
Let us take you one step further...

You took the first step toward getting the Macintosh information you need when you picked up this issue. Now, let us take you one step further with this great deal!

Sign on to MacUser and SAVE up to 50% and get a FREE GIFT.

It's 1001 HINTS & TIPS FOR THE MACINTOSH and it's bound to become a MacUser Classic! This new disk is packed with our best short-cuts, strategies and enhancements for the Macintosh. Not available in any store, 1001 HINTS & TIPS is a MUST if you're serious about making the most of your Mac.

YOURS FREE when you join us as a paid subscriber.

- One Year (12 issues) only $19.97. SAVE 44%!
- Two Years (24 issues) only $35.40. SAVE 50%!

SAVINGS BASED ON ANNUAL NEWSSTAND PRICE OF $35.40.

FOR FASTER SERVICE CALL:
1-800-627-2247

Step up to MacUser today!
With a little help from you and a lot of determination, millions of people are now doing some extraordinary things. Like walking, talking and laughing.

Give the power to overcome. Support Easter Seals.

down system crashes, though. Nine times out of ten, it's an INIT or a cdev garbling up the works, and if you just keep turning off INITs one by one, you'll probably track down the culprit.

As for the System Errors DA, well... it's nice, but you have to have a working Mac before you can use it! I prefer to keep a printed list of codes tacked up by my desk.

Bob: And here's how to do just that, if you have a copy of ResEdit (see Figure 3). First, make a copy of the System Errors DA. (Always work on a copy when you're using ResEdit — it can do nasty things to a file.)

Launch ResEdit, and double-click on the System Errors DA. In the window that opens, double-click on the TEXT item. Now double-click on TEXT "SysErrorList 2.1" ID= -15392 (it may have a slightly different name if you have a different version of the DA).

Next, select all the text by either dragging the beginning to the end or clicking just before the very first character (it's a bullet in Figure 3), scrolling to the end of the text, holding down the Shift key, and clicking after the very last character. Select Copy from the Edit menu. Now quit ResEdit, launch your favorite word processor, and paste. You now have a text version of the error codes.

The Upgrade Path

Q. I'm thinking of getting a Mac II and would like to upgrade eventually to a IIx. What is the best hardware configuration (monitor, color board, RAM, keyboard, and so on)?
Matthew Micka
Cooperstown, OH

Andy: I'm thinking of upgrading to a IIx too; I'm going to steal Bob's. But back to your problem — it doesn't matter what peripherals you buy for your II. Any monitor, keyboard, or color board that works in the II will also work in the IIx.

So buy the best stuff you can afford that fits your needs. As for RAM, any memory that you buy for your II will be utterly useless in the IIx, because the latter machine uses fancy-schmancy 80-nanosecond chips that won't fit, much less work, in your II. So buy as little RAM as you can to get by until you upgrade, and start buying lottery tickets.

Dedicated Phone Line?

Q. Recently I bought a fax machine and a modem for my house. The salesman at the store where I bought the stuff says I need to have extra phone lines for the things, but I hardly want the house wired up like the American Embassy! Do I really need all these phone lines?

Jodie Zechowy
Ludlow, MA

Andy: Technically speaking, no. A phone line is a phone line, and the hardware you mention is perfectly happy wherever it can find a dial tone. A second phone line is a necessity if you intend to keep things running 24 hours a day (if you're running a BBS or want to keep the fax machine on 24-hour standby), unless you're absolutely sure no one will want to engage you in analog telecon (nerd-speak for "talk you on the phone").

You may consider adding a second line for purely anthropological reasons, however, particularly if you have roommates. See, the usual way that human beings check to see if another human is using the phone is to pick up an extension and shriek, "Hey, anyone on the phone??!!" This has the effect of sliming whatever data is coming across the phone line at the time and making your modem very angry with you. Another problem
If you want clarity, brightness, and terrific contrast, and you've resigned yourself to paying a premium of hundreds of dollars to get it, you'll find our newest monitor pleasant viewing indeed.

The PanaSync C1381 gives you sharp color graphics, with 0.28 dot pitch. And virtually infinite color resolution.

And it's a masterpiece of ergonomics. With front-mounted controls, tilt/swivel stand, plus a non-glare tinted black-matrix screen.

You'll find the PanaSync as comfortable with a Mac II color graphics board as it is with an IBM-compatible running VGA, SuperVGA or 8514/A graphics boards.*

All this at a suggested retail price scarcely more than monitors offering a great deal less. For more information, simply call toll-free 1-800-742-8086.
with voice/data cohabitation is Call Waiting. That’s the feature that allows you to be just as rude to callers with your one-line phone as you can be with a two-line phone, without any extra hardware. When you hear a beep on the phone, you know another call is coming in. Unfortunately, this beep is to moderns what garlic is to vampires. One beep, and your modem runs screaming into the night, terminating its connection (and whatever file transfer you had going at the time).

You can deal with such problems without buying a second phone line, of course. Personally, I just hang sticky notes on every telephone in the house (“I’ll give you a dollar if you don’t pick up this receiver”) just before I begin a telecommunications session.

You can temporarily switch off call waiting in most parts of the country by dialing * 70 before dialing the number you want to connect to. Call waiting will be reactivated as soon as your modem hangs up.

Another solution is to buy a bunch of “privacy switches,” little boxes you plug into every phone jack in the house. Then, whenever your modem goes off-hook, all the other receivers go dead. Radio Shack sells its Teleprotector (stock #43-107) for just $7.95—if you put them onto two or three phones, it’s a lot cheaper than a second phone line.

A 75-Percent Solution
Q: I have a Mac SE with an internal hard-drive disk and an ImageWriter II. I do 99 percent of my work with Microsoft Works 2.0, and 75 percent of that is word processing. I do very little work with graphics. I could use some advice in three areas:

1. I like to use at least 7 inches of text width on a standard 8.5-inch page. How can I easily (cheaply) get it all onto my screen simultaneously without having to scroll and wrap-around? Do I have to buy a monitor?

2. I want better printed resolution of the few Works fonts I use, as when I’m up-sizing itals.

3. I would like to be able to print one document while I am simultaneously working on another document.

Gifford T. Jones
Kirklan, WA

Bob: Let’s take these one at a time.

1. The least expensive solution would be to install Stepping Out II (Berkeley Systems, 1700 Shattuck Avenue, Berkeley, CA 94709; [415] 540-5535). It has a reduction mode that lets you work on your document at 75 percent of its true size, which would give you your 7-inch margins. Unfortunately, it also makes on-screen type hard to read, especially if you use small type — 12 point or smaller — to begin with. As you probably compose letters in 12-point type, this probably isn’t the optimal solution for you.

Why not consider a single-page monitor? They’re not as expensive as you might think. I just got a Mirror PixelView II (two-page) display, and it performs admirably, especially considering that it’s less than half the price of the Apple Two-Page Display. The PixelView I — Mirror’s single-page display — sells for less than $660. The company even offers a 30-day “love it or return it” guarantee.
Producing a successful mail-order catalogue takes a big investment — and results depend entirely on reaching the right buyers.

MacAvenue is the Macintosh-only division of mail-order giant CompuAdd, which enjoyed over $400 million in sales last year. They know servicing the industry inside-out, and they know that reaching the right buyers requires MacUser.

"We're looking for the knowledgeable buyer," says Michael Shapiro, MacAvenue's General Manager. "We need the people who know what they're buying and why, and we've found that MacUser readers are quite sophisticated.

"Inserting a MacAvenue catalogue in MacUser was the right decision to help get our business off to a successful start. MacUser often outperformed 2 to 1. Sometimes 5 to 1 or 6 to 1. And the invoices average about 10 to 30 percent higher with MacUser. We were pleasantly surprised to find that our first ad in MacUser was still pulling the sales two months after the issue went out.

"How beneficial is MacUser? Beneficial enough that having examined the results we'll be running the catalogue again."
2. Try Adobe Type Manager (Adobe Systems, 1585 Charleston Road, Mountain View, CA 94039; [415] 961-4400). Although it will slow down your SE a bit, it’ll usually give you better output on your ImageWriter, no matter what type size you select. It should also improve the appearance of italics. Added bonus: It makes odd-sized fonts—such as 11 or 13 point—look better on-screen.

Now for the drawback: It only works with PostScript fonts, so you’ll probably have to buy some if you don’t already own any.

3. SuperSpool (Fifth Generation Systems [504] 291-7221) is a print spooler that lets you print to an ImageWriter while continuing to work on another document. Be advised that your Mac’s performance will be degraded slightly while the file is printing, but if you’re like most people, you’ll find the trade-off acceptable.

Andy: Have you ever considered that the upcoming release of System 7.0 might solve your font woes? Outline fonts (the same sort of technology ATM uses) will be an integral part of the new System, but unfortunately the new font format will be incompatible with your current fonts and also incompatible with PostScript (ATM) fonts. My advice: Get ATM. It does a good job, and it’s pretty affordable. It does ship with some standard Mac PostScript fonts (such as Times and Helvetica, which are practically all you would need if you were publishing, say, MacUser) to get you started.

Custom Startup Screens
Q. I’ve seen Macs on which instead of a “Welcome to Macintosh” message, people see the Batman logo when they startup. How can I do this on my machine?

Mike Schuster
New York, NY

Andy: That’s what’s known as a StartupScreen, and setting one up is pretty simple. First, contact DC Comics, owner of the Batman logo, and ask for a limited license to use and reproduce its trademarked property. This shouldn’t cost you more than $20,000. Scan the logo into a MacPaint file.

Next, the MacPaint file has to be converted to a StartupScreen. Many paint programs can do this conversion for you, but there’s a shareware program called ViewPaint that can do the job just as well. Just drag the resulting file (named StartupScreen) into the System Folder, and you’re done.

As far as I know, this technique works with all comic-book characters.

Bob: As long as you plan to use the logo on your own machine and not sell it, you can skip the step where you pay DC Comics. (Sorry, Andy, you should have saved that money for a Mac.)

Another thing: You can create the logo from scratch in any paint program—MacPaint 2.0, SuperPaint, UltraPaint, or PixelPaint, for instance—that supports the StartupScreen format. You don’t have to mess with a scanner if you’ve got even a modicum of artistic ability.

Finally, if you have a color-compatible Mac, you can even have a color StartupScreen. All you have to do is use a color paint program that supports the StartupScreen format.

PRESERVATION...PLAN ON IT

Planning on restoring a house, saving a landmark, reviving your neighborhood?

Gain a wealth of experience and help preserve our historic and architectural heritage. Join the National Trust for Historic Preservation and support preservation efforts in your community.

Make preservation a blueprint for the future.

Write:

National Trust for Historic Preservation
Department PA
1785 Massachusetts Ave., N.W.
Washington, D.C. 20036
Introducing Zmac

The on-line companion to MacUser and MacWEEK

Buyer be aware
If your job is buying Macintosh products, you need access to the latest product information fast. Zmac is the only on-line service that combines MacWEEK’s timely information with MacUser’s in-depth product evaluations to bring you data you can use as you can use it.

A guide to 2,000 products
Search the Zmac Buyers Guide database to find comparative information on Macintosh hardware and software products. Features, price points, MacUser’s authoritative reviewers’ recommendations — all here just minutes away.

Tomorrow’s news on-line today
Take an advance peek at MacWEEK’s headlines before they go to press. Look for MacWEEK News Beat.

Talk back to the editors
Interact live with MacUser and MacWEEK editors in real-time forums. Register an instant letter to the editor. Trade rumors with Mac the Knife. Talk back to columnists like John Dvorak, Guy Kawasaki and Steve Bobker.

Power up with tools you can use
MacUser Power Tools — a collection of computer scripts, programming code and utilities developed by MacUser editors — is accessible at no additional charge.

All the shareware that’s fit to share
Zmac’s Download Library offers only the most useful shareware and freeware. Each program is hand-selected by editors of MacUser and MacWEEK.

Day or night: help is on the way
Tech Support is an indexed database of tips and hints previously published in the help columns of MacUser and MacWEEK. Through a link with Computer Library, Ziff-Davis’ on-line database of 150 computer publications, Zmac subscribers can also retrieve full text of any MacWEEK or MacUser article. When you have to burn the midnight oil, it’s nice to know our library is never closed.

GO ZMAC and discover
Any CompuServe subscriber can access Zmac by typing GO ZMAC at the exclamation point (!) prompt. If you don’t subscribe to CompuServe, sign up for Zmac on-line by following these directions.

How to sign up for Zmac
You’ll need a modem and telecommunications software. Set your format for 8 bits, one stop and no parity.
Find your local access number: Dial 1-800-FIND CIS (346-3247). When connected, press RETURN.
At Host Name prompt, type PHONES.
Follow instructions to locate access numbers in your area. Hang up.

Signing up for an account
Dial up using your local access number. When connected press RETURN.
You’ll see the following prompts on-screen. Your responses are printed in bold.
Host Name: CIS
User ID: 177000,5200
Password: Z*MAC
Agreement Number: Z12D0890
You will then be prompted for additional information including a credit card number for billing purposes. If you cannot bill to a credit card, call the CompuServe Customer Support line listed below.
Your new Zmac ID and password will be displayed on-line. Call again and explore Zmac. A new password will arrive in the mail within 10 days.
For assistance in membership, billing or passwords call CompuServe Customer Support at (800) 848-8990.
For many of you, mail order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section.

It's what you've been demanding — a convenient place to quickly find the products you need from the vendors you want to buy from. MacUser's Direct Line to products is just one more reason to turn to MacUser for relevant information aimed at the serious user.
**LASER PRINTERS**

- **Texas Instruments**
  - Texas Instrument PS17 Microlaser with AppleTalk Interface: $1,699
  - Texas Instrument PS35 Microlaser with AppleTalk Interface: $1,899

- **Qume**
  - Qume ScriptEN Laser Printer: $1,799
  - Qume CrystalPrint Publisher I: $1,799
  - Qume CrystalPrint Publisher II: $2,395
  - QMS PS410 Laser Printer: $2,149

**HARD DISK DRIVES**

- **Quantum**
  - Quantum 40: $299 Internal, $389 External
  - Quantum 80: $459 Internal, $529 External
  - Quantum 105: $509 Internal, $579 External
  - Quantum 120: $639 Internal, $699 External
  - Quantum 170: $779 Internal, $849 External
  - Quantum 210: $899 Internal, $969 External

**IMPRIMIS** High Capacity Hard Disk Drives

- **MacWren**
  - MacWren 300: $1,299 Internal, $1,379 External
  - MacWren 330 Runner: $1,549 Internal, $1,649 External
  - MacWren 600: $1,849 Internal, $1,949 External
  - MacWren 1.2 Gigabyte: $3,199 Internal, $3,399 External

**MONITORS**

- **RasterOps**
  - 8L ColorSystem 19": $4,199
  - 24L ColorSystem 19": $5,499
  - Clear Vue II: $1,099
  - Clear Vue Gray Scale II: $1,499
  - ColorBoard 208: $325
  - ColorBoard 264: $499
  - ColorBoard 364: $1,299

**HARDWARE**

- **radius**
  - Full Page Display +, SE: $1,080
  - Pivot Display: $1,269
  - Two Page Display 19": $1,449
  - Two Page Display 21": $1,679
  - Accelerator Boards: Call

**MISCELLANEOUS**

- **Microtek 300ZS Color Scanner**: $1,679
- **Magnavox 14" Color Monitor**: $439
- **Abaton 24/96 Fax Modem with Video Interface for Mac II Family**: $699
  - SE/30: $799

**CONTACT INFORMATION**

- **Phone**: 1-800-888-8779
- **Fax**: 602-897-1921
- **Address**: 4747 East Elliot Road, #29-461 • Phoenix, AZ 85044

All prices subject to change without notice. All products subject to availability.

Please circle 187 on reader service card.
Backup Automatically...

Imagine a backup program that backed up everything that you did everyday. A program that you never had to remember to use. It just worked automatically.

That program is Backmatic from Magic Software. Backmatic will automatically backup your new or changed files to your floppy drive, hard disk, or network server when you shut down. Backmatic can also backup at preselected times, like noon and 5:30 everyday or on Tuesdays at 4 a.m. Backmatic is perfect for the individual Macintosh user, essential for the networked group, and ideal for Macintoshes that never shut down (like file servers.) Backmatic... because without it... backing up is hard to do!

Backmatic is just $99.95 for a single user, 5 and 10 user packs and site licenses are available. For more information, see your local dealer or contact us directly.

Magic Software, Inc.
2239 Franklin St. • Bellevue, NE 68005
800-342-6243 • 402-291-0670

Please circle 368 on reader service card.
**PRINTERS**

- **TI microLaser PS35** $1935
  MacUser #1 Personal Printer (4.5 Mice)
- **TI microLaser XL** Call!
  16 Pages per Minute, SCSI Port & ATMI
- **TI microLaser PS17** $1735
  All TI microlaser prices include AppleTalk!
- **TI memory upgrades** Call!
  The best price in the USA!
  We stock all TI microlaser add-ons:
toner, envelope feeders, second paper drawers,
legal and letter size paper trays, and font

**COLOR PRINTERS**

- **Seiko ColorPoint PS** Call!
- **Kodak Diconix Color Printer** 4 Call!

**FAX MODEMS**

- **Challenger VP24/96** $109
  Send only 2400 data/9600 fax
- **Challenger VP24/965R** Call!
  Send & Receive 2400 data/9600 fax
- **Global Village TelePort** $125
  Send only 2400 data/4800 fax.
  Connects to Mac ADB port
- **Orchid Fax Modem** $425
  Send & Receive Networkable 2400
data/9600 fax includes BackFax
- **Prometheus 9600 Plus** $735
  Send & Receive Grey Scale
  9600 data/9600 fax

**DATA MODEMS**

- **Challenger VP2400** $69
- **Challenger VP2400 V.42 bis** $193
- **Hayes V-Series 9600** $695
- **Hayes V-Series Ultra 9600** $795
- **Practical Peripherals 9600SA** $545
- **Prometheus 9600 Plus** $735

**CD-ROM**

- **NEC Portable** $395
- **Toshiba** $745
- **PLI (Sony)** $795
- **Pioneer DRM-600** Call!
- **Minichanger**

**SIMMS**

**ACCELERATORS**

- **DayStar Fast Cache Iic** $275
- **DayStar 50 MHz PowerCache Iic** Call!
- **DayStar 25 MHz PowerCard** $995

**MONITORS**

- **E-Machines T16** $1995
  call for other E-Machines
  Ikegami 20" Trinitron $2895
  with 8 bit card
  NEC Graphics Rival 19" $1095
  Seiko 14" Trinitron $995
  Seiko 14" w/RasterOps 208 $895
  Seiko 14" w/RasterOps 264 $990
  RasterOps 208 $295
  RasterOps 264 $395
  SuperMac Call!

**SYQUEST**

- **Mass Micro DataPak** $695
- **PLI Infinity Turbo 40** $695
- **Syquest Cartridge (In Stock!!!)** $72

**HARD DRIVES**

- **Quantum and MacWren** Call!
  Only the finest at the BEST PRICE!!!
  Maxtor 650 External Hard Drive!!!
  $2195

**OPTICAL DRIVES**

- **Caere TYPIST** $465
- **Microtek 3000ZS** Call!
  Free Copy Studio & Image Studio
  We will not be undersold on MicroTek!!
  UMax UG80 (256 Grey Scale) $995

**SCANNERS**

**CD-ROM**

NEC Portable $395
Toshiba $745
PLI (Sony) $795
Pioneer DRM-600 Call!
Minichanger

**MACCENTER**

The Center Of The Macintosh Universe™

8:30 am - 7:00 pm CST M-F
10:00 am - 4:00 pm CST Sat.
Sunday - Call, you may get lucky.

**ACCELERATORS**

- **DayStar Fast Cache Iic** $275
- **DayStar 50 MHz PowerCache Iic** Call!
- **DayStar 25 MHz PowerCard** $995

**MONITORS**

- **E-Machines T16** $1995
  call for other E-Machines
  Ikegami 20" Trinitron $2895
  with 8 bit card
  NEC Graphics Rival 19" $1095
  Seiko 14" Trinitron $995
  Seiko 14" w/RasterOps 208 $895
  Seiko 14" w/RasterOps 264 $990
  RasterOps 208 $295
  RasterOps 264 $395
  SuperMac Call!

**SYQUEST**

- **Mass Micro DataPak** $695
- **PLI Infinity Turbo 40** $695
- **Syquest Cartridge (In Stock!!!)** $72

**HARD DRIVES**

- **Quantum and MacWren** Call!
  Only the finest at the BEST PRICE!!!
  Maxtor 650 External Hard Drive!!!
  $2195

**OPTICAL DRIVES**

- **Caere TYPIST** $465
- **Microtek 3000ZS** Call!
  Free Copy Studio & Image Studio
  We will not be undersold on MicroTek!!
  UMax UG80 (256 Grey Scale) $995

**SCANNERS**

- **Caere TYPIST** $465
- **Microtek 3000ZS** Call!
  Free Copy Studio & Image Studio
  We will not be undersold on MicroTek!!
  UMax UG80 (256 Grey Scale) $995

**CD-ROM**

NEC Portable $395
Toshiba $745
PLI (Sony) $795
Pioneer DRM-600 Call!
Minichanger

**MACCENTER**

The Center Of The Macintosh Universe™

800-950-3726

Fax: 512-476-3726

MasterCard, Visa & COD accepted.
Corporate, Government & University
P.O.'s accepted with approved credit.

Please circle 163 on reader service card.
Only $495!

Samsung Full Page Display w/Video Card
At this price, you can't afford not to have one of these incredible eyesavers! Quality, flicker-free images at a price that lets you experience the convenience of large-screen viewing.
- 870 x 640 resolution
- 15" portrait display monochrome screen
- paper-white phosphor
- 69 Hz vertical, 63 Khz horizontal refresh rate
- integrated tilt & swivel base
- SE, SE/30, or Mac II video card
Makes on-screen proofing easy!

Priced too low to print!

QMS Colorscrip 100 Printer  Can you afford not to have it? Right out of the box you'll print near typeset quality 300 dpi hard copies or transparencies in vibrant colors that adhere to PANTONE specifications. You'll have total freedom in composing using shapes and typefaces and over 16 million colors in endless variations.
- 35 resident Adobe fonts
- Apple-talk compatible
- 8 Mb RAM with spooling
- Pantone certified
- One-year warranty
The clarity and power of full color Postscript printing!

‘Now YOU can afford to buy a high-performance Samsung monitor — the best value available today!"

When Apple Computer chose Samsung as its primary supplier of monochrome CRTs for the MacPlus, SE, and SE/30, they based their decision on superior quality and value.

I PERSONALLY GUARANTEE you’ll be pleased with the power, performance, and competitive price of these monitors.”  Real Provencel

Samsung Dual Page
Display w/Video Card
No more squinting and scrolling! Seeing two pages at once will save you hours of time. The latest in flicker-free monochrome technology provides true WYSIWYG! The video card is based on custom VLSI design, with a minimum power draw resulting in maximum reliable and long life.
- 1024 x 768 resolution
- 19" screen, 72 dpi
- paper-white phosphor
- 78 Hz vertical, 65 Khz horizontal refresh rate
- integrated tilt & swivel base
- SE, SE/30, or Mac II video card
Power and function at a competitive price!

$895!

QMS PS-810  Faster printing (8 pages per minute) at an economical price!
Outstanding print quality. An affordable Adobe Postscript laser printer that features the reliable Canon SX print engine. The QMS PS-810 utilizes a 68000 MPU-based controller operating at 16 MHz with proprietary ASAP technology. Get 40% faster “first-page-out” performance than Apple LaserWriter NT!
- 2Mb RAM...expandable to 3
- 35 resident typefaces!
- RS232/422 standard, Centronics parallel and AppleTalk interface
Speed, flexibility and power!

Now $2895!

PRINTERS

QMS PS 820 ............................................ 3595
QMS PS 820 Turbo .................................. 4795
Ti PS17 Microlaser ................................. 1795
Ti PS35 Microlaser ................................. 2049
Our buying power gives you your buying power!

$1179
Seiko 14" Trinitron with RasterOps 24-bit Video Card
Amazing color. High-resolution Trinitron tube makes it possible to view 16 million shades of color!
- 640 x 480 resolution
- 14" display, 72 dpi
- 24-bit video card
- integrated tilt & swivel base
43% brighter than the leading competitor!

$1619
RasterOps ClearVue/GS (Grayscale Monitor) Unmatched image quality! Flicker-free images in 256 shades of gray for accurate proofing. Includes Pan/Zoom and Virtual Desktop features for maximum productivity!
- 1024 x 768 resolution
- 19" display, 72 dpi
- paper-white phosphor
- integrated tilt & swivel base
- 75 Hz vertical refresh rate
Zoom in to check details!

An incredible price for the latest technology in large-screen color viewing.

NEW! Ikegami 19" Trinitron Color Systems!
New generation Trinitron technology... superior to other Trinitrons currently available. Ikegami—the market leader in grayscale monitors—introduces the undisputed champ in color reproduction. Each system comes with an integrated tilt/swivel stand, and auto and manual degaussing. Full antiglare coating, 75 Hz vertical refresh rate, and flicker-free images reduce eye strain and improve user comfort. Coupled with a high resolution 1024 x 768 video card, this combination is the top-of-the-line color solution available today.
The right solution for every budget!

Upgradable to 24-Bit Color

<table>
<thead>
<tr>
<th>System</th>
<th>Colors</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Level</td>
<td>256</td>
<td>$2995</td>
</tr>
<tr>
<td>Professional</td>
<td>256</td>
<td>$3495</td>
</tr>
<tr>
<td>Master’s</td>
<td>16 Million</td>
<td>$3995</td>
</tr>
</tbody>
</table>

MONITORS w/Cards

- Magnavox 14" w/8-bit $918
- NEC Macsync 14" w/8-bit $869
- Sony Trinitron 1304 14" w/8-bit $1095

Other Monitors Available! Please call.
Hardware solutions for all your business needs.

FREE CONSULTATION to help you answer these four questions:
1. What combination of CPU, HD, monitor & video card best fits your needs?
2. How will System 7.0 affect your buying decision today?
3. How much RAM will be enough?
4. 8-bit vs. 24-bit, which is for me?

We can help you answer these questions, and can offer you the ideal combination of hardware (and software) for your exact needs.

**SYSTEMS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac SE</td>
<td>2 Floppy Drives, 2.5 Mb RAM, 105 Mb Quantum Internal Drive, Samsung Dual Page</td>
<td>$3650</td>
</tr>
<tr>
<td></td>
<td>Display, Datadesk Mac 101 Keyboard.</td>
<td></td>
</tr>
<tr>
<td>Mac llx</td>
<td>5 Mb RAM, 170 Mb Quantum Internal Drive, 19&quot; Sony Trinitron Monitor</td>
<td>$9795</td>
</tr>
<tr>
<td></td>
<td>Apple Extended Keyboard.</td>
<td></td>
</tr>
<tr>
<td>Mac llfx</td>
<td>B&amp;W Dual Page, 4 Mb RAM, 105 Mb Quantum, Mac 101 Keyboard</td>
<td>$13,150</td>
</tr>
<tr>
<td></td>
<td>Classic, 105 Mb Hard Drive, Apple Extended Keyboard.</td>
<td></td>
</tr>
<tr>
<td>Mac Hex</td>
<td>1 Floppy Drive, 5 Mb RAM, 105 Mb Quantum Internal Drive, Seiko 14&quot; Color</td>
<td>$5625</td>
</tr>
<tr>
<td></td>
<td>Monitor with 24-bit RasterOps Video Card, Apple Extended Keyboard.</td>
<td></td>
</tr>
</tbody>
</table>

"Getting the right system is critical. You don't want to buy more power than you need today...but you want to make sure your system can be enhanced to meet future needs." — Rick Provancher

Guaranteed: If you don't like it
COMMUNICATIONS SOLUTIONS

• Software
  LapLink Mac ...................... 119
  Liaison .................................. 259
  MacLink Plus .......................... 139
  Microphone III .......................... 225
  QuickMail (10 Users) .................. 329
  White Knight ........................... 81
  Timbuktu ................................ 99
  TOPS (Mac) ............................. 199

• Hardware
  Abaton InterFAX 2400/9600 .......... 419
  Everex 2400 .......................... 249
  Hayes Personal Modem 2400 .................. 165
  MacFax .................................. 449
  Shiva NetModem 2400 .................. 439
  Shiva NetSerial ......................... 295
  SmartModem 2400M Bundle .......... 429

$1895 Microtek MS 300ZS Color Scanner with Color Studio and Image Studio

Affordable options to enhance your system.

WORD & PAGE LAYOUT

Quark XPress $549

Adobe Postscript Fonts... Call
Adobe Type Manager ....... 59
Adobe Type Manager Plus ... 119
Coach Professional ........... 117
Design Studio .................... 519
FullWrite Professional ........ 269
More 2.0 ......................... 255
OmniPage 2.0 ............... 589
Pagemaker 4.0 ............... 539
Read It! (OCR) .......... 260
ReadySetGo! 4.5 ....... 285
Write Now 2 ........ 122

Adobe Photoshop $569

GRAPHICS

Canvas 2.1 ................................. 189
Digital Darkroom .................. 255
Dreams .................................. 335
Freehand ....................... 349
Illustrator 3.0 Bundle ........... 369
Image Studio ......................... 149
Laser Paint II ...................... 439
MacDraft ......................... 199
MacDraw II ..................... 329
Minicad Plus ..................... 539
Pixel Paint Professional ....... 439
Studio 1 ................................. 109
Studio 8 ........................ 350
Super 3D Enhanced ............. 331
SuperPaint 2.0 .................. 133
Swivel 3D 1.1 .................. 325

SCANNERS

Microtek MS II ............... 1129
Microtek MS 300GS (256GS) .... 1329
Microtek MS 400GS (256GS) .... 2859
ScanMan M32 .... 369
Sharp JX 300 Color .......... 2495
Sharp JX 450 Color .......... 3895

UNINTERRUPTIBLE POWER SUPPLIES

450 AT .......................... 375
AP 110 SE ....................... 229
AP 360 XT .......................... 279
MinuteMan 300 .................... 429
MinuteMan 600 .................... 695

TARGUS PREMIUM CASES

IW II Case ....................... 49
Mac Plus Case ..................... 59
SE Extended KB Case ........... 75

PERIPHERAL LAND

1.44 Mb Floppy .................. 329
Infinity Turbo 40 ............... 799
Infinity Dual Turbo 40 ...... 1850
PL 200 Int .......................... 1465
PL 250 Int .......................... 1765

EVEREX

EMAC 60T (Tape Back-up) ...... 665

8 Reasons To Order From Us (besides saving money!)

1. 30-day money back guarantee on all hardware (except for special-order items). No ifs, ands, or buts!
2. Software guarantee. If it doesn’t fit your needs, we will happily refund the purchase price minus the applicable trial fee. No hassles!
3. Toll-free tech support when you need advice or want to order.
4. Pay when shipped... We charge your credit card only when your order is shipped—not when you place the order.
5. Trade-ins accepted. We gladly take trade-ins on Mac CPUs and printers in good working order.
6. Overnight delivery when you need it.
8. Installation & training anywhere in the U.S.

“We’re not happy UNLESS YOU ARE!”

We want you to become a repeat customer. So we give you:
• discount mail-order prices
• superior service & selection
• an unbeatable hassle-free warranty
• toll-free tech support
• an unsurpassed return policy. And we do it all with a smile... because that’s what you deserve.

Several members of our management team: (I to R) Barbara, Jim, Lew, Réal.
1. Please indicate which of the following computers you currently use in your company or organization: (check all that apply)
   - [ ] a) Mac Plus
   - [ ] b) Mac SE
   - [ ] c) Mac II
   - [ ] d) IBM PC
   - [ ] e) Other

2. For how many microcomputers do you buy products?
   - [ ] a) 1
   - [ ] b) 2
   - [ ] c) 5 - 9
   - [ ] d) 10 +

3. Your primary job function is:
   - [ ] a) Administrative/General Management
   - [ ] b) MIS/DP, Communications Systems, Programming
   - [ ] c) Engineering/R&D
   - [ ] d) Financial/Accounting
   - [ ] e) Marketing/Sales
   - [ ] f) Computer Dealer/VAR

4. For which of the following products are you interested in selecting brands/models to be bought by your company or organization? (Check all that apply)
   - [ ] a) Software
   - [ ] b) Hardware
   - [ ] c) Services
   - [ ] d) Computer Accessories

5. Are you involved in the purchasing of microcomputer equipment at your company?
   - [ ] a) Yes
   - [ ] b) No

6. If so, what function do you serve in the buying process?
   - [ ] a) Evaluations/Specification
   - [ ] b) Recommendation
   - [ ] c) Buyer/Purchaser

Please print clearly.

Name: ____________________________
Phone: ___________________________
Company: ________________________
Title: ____________________________
Address: _________________________
City: ____________________________ State: _______ Zip: _______

4. Please send me a one-year subscription to MacUser for $19.97. Offer valid in U.S. only.

PLEASE PRINT CLEARLY.

Name: ____________________________
Phone: ___________________________
Company: ________________________
Title: ____________________________
Address: _________________________
City: ____________________________ State: _______ Zip: _______

4. Please send me a one-year subscription to MacUser for $19.97. Offer valid in U.S. only.

PLEASE PRINT CLEARLY.

Name: ____________________________
Phone: ___________________________
Company: ________________________
Title: ____________________________
Address: _________________________
City: ____________________________ State: _______ Zip: _______

4. Please send me a one-year subscription to MacUser for $19.97. Offer valid in U.S. only.

PLEASE PRINT CLEARLY.
HOW TO STAY ON TOP OF WHAT'S IN THE MAC MARKET

USE THIS CARD TO OBTAIN FREE INFORMATION ABOUT MACINTOSH PRODUCTS AND SERVICES IN THIS ISSUE

(SEE OTHER SIDE)

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO 433 RIVERTON NJ

POSTAGE WILL BE PAID BY ADDRESSEE

MacUser
PO BOX 1688
RIVERTON NJ 08077-9688
Why Third Wave?

Third Wave uses only the highest quality, fastest, most reliable fixed drive mechanisms on the market. Some of our competitors ship untested, unformatted drives or ship inferior user manuals. Third Wave, on the other hand, has strict drive test procedures and every drive is formatted and includes over 200mb of software. And when drives fail we provide one-day turnaround.

From our economically priced Standard enclosures to the largest capacity drive in our Premium enclosure, Third Wave offers the most complete line of drives for the Mac. Premium enclosures offer virtually silent fans, easy terminator access, and high quality metal chassis construction. Other features include international power supplies, zero footprint design, and good looks. You get what you pay for when you buy a storage system from Third Wave Computing.

Performance Backup Systems

Tape backup systems from 60mb to 2.3GB capacity. Award-winning Retrospekt software is the heart of all our systems, offering the highest performance (from 3mb/min. to 1mb/min.) and most features of any backup software on the market. Network backup using Retrospekt Remote also available.

Best Removable & Combo Systems

No one has a more complete selection of removable and combo storage solutions than Third Wave. Our Syquest removable is available in the economical Standard enclosure, the Premium enclosure, or as a dual Syquest drive system. Combo drives range from the 40mb Quantum drive to 2.3GB Quantum with a Syquest or tape drive, all the way up to 1GB fixed drives with DAT or Optical drives. Combo drives are space-saving, money-saving options for the discriminating buyer who wants no compromises.

Six Years of Support & Service

Third Wave is in its sixth year of serving the Macintosh community. We strive to provide the best technical support possible. We are authorized resellers of every product we sell, including Apple, RasterOps, Radius, SuperMac, etc. We ship Federal Express for the best shipping, too.

Bundled Drive Software

Included software and features: disk management software with partitioning, password protection, test features, bad block management, Mounter desk accessory, removable drive INIT and more. The most complete formatting utility available for the Mac. Fontina™, the ultimate font management utility from Eastgate Systems ($69.95 value.) Other included software: complete Virus utilities, 12mb of public domain and shareware, 10mb slide show of 8/24 bit images created with StrataVision 3d, our own HyperDex HyperCard utility, and much more. No one gives you more software than Third Wave.

SIMMs & Memory

Mac SIMMs (1, 4mb) Call
Ihx SIMMs (1, 4mb) Call
NTX SIMMs Call
Portable 1, 2, 3mb Call

Memory Third Wave utilizes the latest surface mount manufacturing technology to bring you economically priced SIMMs and memory products. Since we have complete control over the manufacturing process, you can count on our quality. Unlike other suppliers, we are manufacturers, not just box stuffers.

Performance Add-ons

DayStar FastCache IIc $299
DayStar Accelerators $189
68851 PMMU w/Virtual $189

We sell many performance products but don’t have room to list them all. Please call for more information.

Video & Monitors

Seiko Trinitron 14" $589
Sony 1304 14" $699
Ikegami Trinitron 19" $2299

Authorized Radius, RasterOps, and SuperMac resellers
America's Largest Macintosh Hardware Source

Prices effective through January 1991

Laser Printer Sale

ScripTEN PostScript® Laser Printer
$1,799
- 10 Pages per minute
- 11 Font Families (35 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies

CrystalPrint Publisher I Laser Printer
$1,899
- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies

CrystalPrint Publisher II Laser Printer
$2,395
- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Adobe type one support
- Solid Blacks for graphics
- Letter, Legal and transparencies

PS17 Microlaser PostScript® Laser Printer
$1,699
- 1.5 Megabytes of RAM
- 6 pages per minute
- 17 typefaces
- Letter, Legal, and transparencies

PS35 Microlaser PostScript® Laser Printer
$1,899
- 1.5 Megabytes of RAM
- 6 pages per minute
- 35 typefaces
- Letter, Legal, and transparencies

QMS PS410 PostScript® Laser Printer
$2,179
- 2 Megabytes of RAM
- 4 pages per minute
- Letter, legal, envelopes, and transparencies
- Auto switching between Macintosh and IBM.

PostScript® is a registered trademark of Adobe Systems Incorporated.

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional $5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express. Standard Air which is 1 to 2 day service. COD's Shipped by UPS 2 day air. Call for shipping costs. Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability.
The Reasons You Should Buy From MacLand...

1. **Price** — Because of our multi-million dollar buying power, we purchase large volumes of quality hardware at low prices and pass the savings on to our customers.

2. **Delivery** — We offer Same Day Shipping on all in stock items if we receive your order by 3 pm Mountain Standard Time. All credit card orders are shipped by FEDERAL EXPRESS STANDARD AIR service which means you get your merchandise fast!

3. **Technical Support** — MacLand has the best technical support, period. We provide you with technical support BEFORE AND AFTER your purchase. Best of all, to assure you the highest quality, our trained technicians test ALL hard disk drives for quality and viruses before we ship them to you.

---

### Hard Disk Drives

#### Quantum

- Quantum drives have a 2 year warranty!
- **Internal**
  - Quantum 40 19ms: $329
  - Quantum 80 19ms: $459
  - Quantum 105 19ms: $515
  - Quantum 120 15ms: $639
  - Quantum 170 15ms: $759
  - Quantum 210 15ms: $899
- **External**
  - $399
  - $539
  - $599
  - $699
  - $829
  - $959

#### Imprimis

- **Internal**
  - Imprimis MacWren 300 16ms: $1,349
  - Imprimis MacWren Runner 330 10.7ms: $1,549
  - Imprimis MacWren 600 16ms: $1,849
  - Imprimis MacWren 1.2 Gigabyte 16ms: $3,199
- **External**
  - $1,499
  - $1,649
  - $1,949
  - $3,399

#### SyQuest

- 42 Megabyte Removable Hard Disk Drives
  - $499
  - Cartridge not included

- **SyQuest Removable Cartridges**
  - $72
  - Will fit ANY 44 Removable Hard Disk Drive
  - Cartridge 10 Pak now only $700

---

**30 Day Money Back Guarantee**

**On All Imprimis and Quantum Hard Disk Drives**

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)
Full Page Display +, SE w/card: $1,080
Pivot Display w/card: $1,279
Two Page Display 19" w/card: $1,449
Two Page Display 21" w/card: $1,679
Accelerator 16 for Plus/SE: $575
Accelerator 25 for SE: $949

Ikegami 20" Color Monitor

CT Trinitron 8 bit Color System: $2,599
CT Trinitron 24 bit Color System: $3,699

Samsung 15" Full Page Display with Video Interface: $495
Mac Plus, SE, SE/30, and entire Mac II Family

Magnavox 14" Color System
Mac II Family: $699
SE/30: $799
Monitor and Card Included

Fax Modems
Abaton 24/96: $349
Dove 24/96: $279

Microtek Scanners
300ZS Color Scanner: $1,699
300GS Scanner: $1,249

Monitors
NEC MacSync 14" Color System: $479
Sony 1304 14" Color System: $699
Magnavox 14" Color System: $439
Seiko 14" Color System: $589

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional $5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express.
**DayStar DIGITAL**

**Accelerators**
- 25 Mhz PowerCard 030 II . . . $1,089
- 50 Mhz PowerCard 030 II . . . $2,179
- 25 Mhz PowerCard 030 IIX . . . $1,199
- 50 Mhz PowerCard 030 IIX . . . $2,249
- 25 Mhz PowerCard 030 IICX . . . $1,499
- 50 Mhz PowerCard 030 IICX . . . $2,599
- Fast Cache IIC (Hex) $275

**Tape Backups**
- 525 Meg $1,399
- 2.3 Gig $3,699

Both drives include MacXpress™ Software

**Optical**
- COSMOS 600 $2,999
- Magneto Optical

**THREE YEAR WARRANTY**
On All Racet Products

---

**Networking Solutions**

**EtherNet Cards**

<table>
<thead>
<tr>
<th>Asante</th>
<th>Farallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maccon SE30E</td>
<td>StarController EN</td>
</tr>
<tr>
<td>Maccon SE30E 64</td>
<td>Series 300</td>
</tr>
<tr>
<td>Maccon SEE</td>
<td>StarController EN</td>
</tr>
<tr>
<td>Maccon SE ET</td>
<td>Series 500</td>
</tr>
<tr>
<td>Maccon II ET</td>
<td>Nuvotech TurboStar</td>
</tr>
<tr>
<td>Maccon II ET 64</td>
<td></td>
</tr>
<tr>
<td>Farallon</td>
<td>Shiva</td>
</tr>
<tr>
<td>Ethernet Card Mac II</td>
<td>Fastpath 4 Gateway</td>
</tr>
<tr>
<td>Ethernet Card SE30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>$339</td>
<td>$819</td>
</tr>
<tr>
<td>$379</td>
<td>$1,575</td>
</tr>
<tr>
<td>$269</td>
<td>$1,040</td>
</tr>
<tr>
<td>$279</td>
<td>$1,679</td>
</tr>
<tr>
<td>$339</td>
<td>$1,899</td>
</tr>
<tr>
<td>$379</td>
<td>$1,899</td>
</tr>
</tbody>
</table>

**Controllers**

**Upgrade your Mac's Memory**

**SIMM SALE**

$45

FREE! Included with your Simm order is our 22 page, step by step easy installation guide.

Please circle 50 on reader service card.

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)

5006 South Ash Avenue, Suite 101 Tempe AZ 85282 (602) 820-5802
They're all
HARD WORKING

- Super fast 14ms to 28ms access time.
- No less than 30,000 hours Mean Time Between Failure.
- Compatible with Mac II, IICx, IIC, SE, SE/30, Plus & f.x.
- Quality drives from Quantum, Micropolis, Imprimis,
  Toshiba, Fujitsu and Seagate. Your choice.

And
HARD CORE

- Steel case for low heat and added support.
- Whisper-quiet fan for a quiet work environment.
- Power surge protection.
- 24 hour burn-in testing.
- 50-pin connectors for daisy-chaining.

You might say our drives are
HARD TO BEAT

- Designed and engineered by the storage experts
  at Hard Drives International.
- Hundreds of thousands of satisfied customers.
- Lifetime Toll-free technical support.
- 30-day "Worry-Free" Guarantee.
- 1 & 2 Year Replacement Policies.

At prices that are
HARD TO BELIEVE

- We buy quality components in huge volume
  and pass the savings to you!

Now. Isn't it easy to see why POWERDrives are
HARD TO RESIST?

800-733-DISK

U.S. and Canada

<table>
<thead>
<tr>
<th>Mbytes</th>
<th>Mechanism</th>
<th>Access</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Seagate</td>
<td>28ms</td>
<td>$249</td>
<td>$295</td>
</tr>
<tr>
<td>30</td>
<td>Seagate</td>
<td>28</td>
<td>269</td>
<td>319</td>
</tr>
<tr>
<td>40</td>
<td>Quantum</td>
<td>19</td>
<td>339</td>
<td>399</td>
</tr>
<tr>
<td>45</td>
<td>Seagate</td>
<td>28</td>
<td>299</td>
<td>359</td>
</tr>
<tr>
<td>60</td>
<td>Seagate</td>
<td>28</td>
<td>NA</td>
<td>389</td>
</tr>
<tr>
<td>80</td>
<td>Seagate</td>
<td>28</td>
<td>NA</td>
<td>439</td>
</tr>
<tr>
<td>80</td>
<td>Quantum*</td>
<td>19</td>
<td>499</td>
<td>549</td>
</tr>
<tr>
<td>105</td>
<td>Quantum*</td>
<td>19</td>
<td>659</td>
<td>629</td>
</tr>
<tr>
<td>105</td>
<td>Toshiba</td>
<td>20</td>
<td>549</td>
<td>619</td>
</tr>
<tr>
<td>180</td>
<td>Fujitsu*</td>
<td>25</td>
<td>NA</td>
<td>849</td>
</tr>
<tr>
<td>200</td>
<td>Maxtor</td>
<td>15</td>
<td>929</td>
<td>979</td>
</tr>
<tr>
<td>210</td>
<td>Quantum*</td>
<td>16</td>
<td>939</td>
<td>999</td>
</tr>
<tr>
<td>320(Mb)</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>1449</td>
</tr>
<tr>
<td>320(Mb)</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>1449</td>
</tr>
<tr>
<td>600(Mb)</td>
<td>Imprimis</td>
<td>16</td>
<td>NA</td>
<td>1899</td>
</tr>
<tr>
<td>630(Mb)</td>
<td>Fujitsu</td>
<td>16</td>
<td>NA</td>
<td>1949</td>
</tr>
<tr>
<td>660(Mb)</td>
<td>Micropolis</td>
<td>16</td>
<td>NA</td>
<td>2099</td>
</tr>
<tr>
<td>1050(Mb)</td>
<td>Imprimis</td>
<td>16</td>
<td>NA</td>
<td>2999</td>
</tr>
<tr>
<td>1050(Mb)</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>3299</td>
</tr>
</tbody>
</table>

Removable

- SyQuest
  - $575
  - 25ms. Complete with a 45Mb removable cartridge.
- Extra Cartridge Only $79

Memory Upgrades

- 4Mb* 1Mb* $(4x8-80ns) $(1x8-80ns)
  - $299 $49
  - These complete memory kits are ideal for the
    Mac II, IIC, IIC, SE, SE/30 & Plus.

150Mb

Teac Tape Backup

- $599
  - External unit.
  - "Express Tape" by NuVo Labs included.
- Extra Tape Only $49

*2 Year Replacement Policy
Apple Prices that Aren’t Hard to Swallow.

Affordable Macintosh Systems

**Special on MAC Ilis**
Macintosh IIsi CPU, 2mb RAM, 40mb hard drive, 1.44mb FDHD, Apple Standard Keyboard, Apple HighRes 13” RGB. Special Rebate -$250
You Pay $3,343.

**Mac IIfx System**
Macintosh IIfx CPU, Quantum 170 hard drive, 4mb RAM, MacPro Extended Keyboard, 24 bit color, 14” Color Monitor.
You Pay $8,199

**Mac Iici System**
Macintosh Iici CPU, Quantum 105 hard drive, 5mb RAM, MacPro Extended Keyboard, 8 bit color, 14” Color Monitor.
You Pay $4,999

**Mac Classic**
Macintosh Classic CPU, 2mb RAM, 40mb hard drive, 1.44mb FDHD, Classic Keyboard.
You Pay $1,259

Display Solutions

RasterOps 264 below $449* (call)
RasterOps 264/SE30 $599
*Special prices on RasterOps may be available. Please call for lowest prices.
RasterOps 8L 19” System $4125
RasterOps 24L 19” System $4199
Illigami 20” Trinitron $2099
8L 20” card for Iligami $1349
RasterOps 364Board $1299
Seiko 14” CM-1445 Color $539
NEC MacSync HC 14” Color $415
Magnavox 14” Color $479

Express Hard Drives

Apple 40mb $309
Quantum 80 $529
Quantum 105 $549
Quantum 170 $829
Quantum 210 $949
Maxtor 200 $979
Imprimis 300mb Runner $1559
600mb $1298
Externals add $105
External HH Kits $125

With all of the hustle bustle of the holiday season you shouldn’t have to worry about getting the straight story. We promise honesty, expertise, and not to sell you something we don’t believe in just because we make a few dollars more. Call us today for straight answers and the best price available; we’re waiting for your call. 1-800-622-7123.

CPU’S & MORE

Call!!
Apple High Resolution Monitor $710.00
Apple New 12” RGB Call!!
Rasterops 264 $485.00
Rasterops 264/30 $592.00
*Rasterops 8L System 19” Trinitron $433.00
*Rasterops 24L System 19” Trinitron $579.00
*Rasterops Clearview II $1296.00
*Rasterops GS/Grayscale System $1656.00
*Rasterops GS/30 $1656.00
*Rasterops Clearview III/30 $1296.00

Call for Printers and More . . . HP Deskwriter w/Apple Talk $685.00
*Free Shipping Does Not Apply

VIDEO & MORE

Call For Syquest Removable!! All items in stock

Please circle 165 on reader service card.
### Microtech Hard Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>M30</td>
<td>20MB</td>
<td>$195</td>
</tr>
<tr>
<td>M60</td>
<td>40MB</td>
<td>$270</td>
</tr>
<tr>
<td>M80</td>
<td>60MB</td>
<td>$325</td>
</tr>
<tr>
<td>M100</td>
<td>80MB</td>
<td>$400</td>
</tr>
<tr>
<td>M120</td>
<td>100MB</td>
<td>$450</td>
</tr>
</tbody>
</table>

### Applied Engineering

- **1.44MB FLOPPY DRIVE**
  - $29

### Cutting Edge

- **CUTTING EDGE MONITORS**
  - Full Page: $599
  - 75Hz refresh rate includes interface
  - Two Pages: $550
  - Includes interface!

- **QUANTUM**
  - Internal Quantum 40/80/105/170MB: CALL EXTERNAL QUANTUM 40/80/105/105MB: CALL

### New Wave Executive

- **PLUS, SE, SX, 30 w/Extended Keyboard**
  - $49
  - $75
  - $45

- **EDC**
  - $349

- **Syntonic Communication**
  - $75

### QMS Printers

- **ColorScript Model 10 color laser printer with postscript**
  - $739

### IBM Compilaties!

- **286, 20MHz, 1MB RAM, High Speed 1/2 and 3 1/2, Vga Monitor 16 bit**
  - $1325

### Qume

- **Megascreen**
  - Koral mon. 720 monochrome interface
  - For Mac SE/30: $1065
  - For Mac Plus: $1140

### Ikeyagi Color Trinitron

- **20" Trinitron color mon. w/8 bit color card... $2550**
- **22" Trinitron color mon. w/24 bit color card... $3550**
- **28" color monitor w/12 bit color card... $2550**

### RasterOps Monitors

- **24" color monitor 16 bit color... $1995**
- **MegaTron 3216 color monitor... $4500**

### Corporate P.O.s Welcome!

- **Apple, IBM, Adobe, Macromind, Magnavox**

**For Orders Over $200**
- **FREE SHIPPING**
- **FREE BOX OF DISKETTES**

For ANY Non-Advertised Items: We'll Match ANY Legitimate Advertised Price PLUS Give You a FREE Box of Diskettes!
LODEST PRICES!

MegaGraphics
UNIQUELY PRICED PERFORMANCE MAKE MegaScreen RIVAL THE FIRST CHOICE OF KNOWLEDGEABLE BUYERS.
THIS 19" PROFESSIONAL DISPLAY OFFERS:
- 75 dpi resolution
- 1024 x 824 resolution
- 75 Hz refresh rate
- TILT/SWIVEL Stand
Mac SE, SE/30, II, IIX, IICX, IICL and IIXC ...................... $1099
Mac Plus ........................................ $1150

MACH TRAC
High-Performance ergonomic trackball with Drag Lock feature
NOW ONLY $69

NEW!
TARGUS MAC CARRY CASES

ACCESSORIES
45 REMOVABLE HD CART. $69.00
A+ MOUSE $6.60
BERNOLLI 14MB ZIPPAK $220.00
CLEAN KIT BERN 44MB $39.00
DESK-JET 510 CARTRIDGE $15.00
LABELWRITER LABEL $1.00
LASERWRITER II TONER $50.00
MAC 101 KEYBOARD $129.00
MACRCORD $19.00
SWITCHBOARD KEYBOARD $65.00
SWITCHBOARD MODULE $90.00
SYSTEM SAVER MAC SE $59.00
SYSTEM SAVER MACPLUS $59.00
TURBO MOUSE $105.00

HARDWARE
1 MEG SIMMS $59.00
256K SIMMS $25.00
800 EXT MAC DRIVE $140.00
AMT 2400 BALD MODEM $160.00
APPLIED EK. 144 DB $220.00
BERN 44MB EXT SGL DRV $1559.00
CD TECHNOLOGY PORTA DRIVE CALL
CD ROM - PROCOMM $695.00
CDM-3601 KIT $590.00
CLEARVIEW SYSTEM $799.00
COLORBOARD 204 $400.00
COLORBOARD 204-SE/50 $299.00
COLORBOARD 304 $1269.00
COLORSHOT $625.00
COLORSPRINT $395.00
COMPUTER EYES- COLOR $320.00
DESKTOP $899.00
DICONIX JET PRINTER $459.00
E-MACH BIG PICTURE $1739.00
E-MACH TX/16, WICARD $3195.00
E-MACH 721 GMACI $2395.00
E-MACH Z/11-230 $1795.00
E-MACH T16 CARD STAND 2195.00
E-MACH T16 CARD STAND 1995.00
ETHERPORT II MACI $399.00
EXTERNAL 48MB QUANTUM $159.00
EXTERNAL 1536MB QUANTUM $745.00
EXTERNAL 17MB QUANTUM $1795.00
GRAFLEX $79.00
GEMINI CT-20 MONITOR $1900.00
GEMINI CT-20 MONITOR $1900.00
HEXAGON MODEM 24/96 $410.00
LABELWRITER $179.00
LABELWRITER $179.00
CAMS/ synch MONITOR $799.00
MICROTEK OPTICAL $619.00
MICROTEK 40MB KIT $499.00
MICROTEK 80MB KIT $499.00
MICROTEK 160MB KIT $499.00
NEWGEN TURBO PS300 $2999.00

GRAPHICS
ADOBE TYPE FACES CALL
CANVAS V.3 $179.00
CRICKET DRAFT V1.1 $159.00
CRICKET GRAPHIC V1.3 $120.00
CRICKET PRESENTS V2.0 $299.00
DESIGN CAD 20/30 $339.00
FONTAGRAPHER $245.00
FREEHAND 2.0 $249.00
GENERIC CAD LEVEL 1 $79.00
ILLUSTRATOR 3.0 $440.00
MACRIND DIREC $420.00
MARCAD $499.00
OMICRON $65.00
OMICRON $65.00
OMICRON $65.00
OMICRON $65.00
OMICRON $65.00
OMICRON $65.00
OMNIPOINT $99.00
OMNIPOINT $99.00
OMNIPOINT $99.00
OMNIPOINT $99.00
OMNIPOINT $99.00
PAKAGEH 4.0 $499.00
PIXEL PAINT PROF. $375.00
PIXEL PAINT PROF. $375.00
READY SET G0 $310.00
READY SET G0 $310.00
SMART ART I, II, III (each) $79.00
SMART ART IV $94.00
STREAMLINE $230.00
SUPERPAINT V2.0 $125.00
TYPOSTYLER $110.00

BUSINESS/PRODUCTIVITY
4TH DIMENSION $439.00
AT ONCE $375.00
DESKTOP EXPRESS $85.00
FREEDOM ORDER $24.00
FASTPATH 4 GATEWAY $1799.00
FINAL PRESENTATION $299.00
KALEIDOGRAPH $139.00

CMS EXTERNAL HARD DRIVES
New Prices!!!
20MB ........... $329
30MB ........... $375
45MB Removable .... $675
45MB ........... $425
81MB ........... $550
300MB ........... $2200
600MB ........... $3500

IKEGAMI and National Semiconductor Monitor system
19" Trinitron display with 24-bit color card, and hardware Zoom and Pan, cable and tilt/swivel stand. Multiple resolution and flicker-free.
$3595!

Seiko 1445

Mouse Systems
Trackball $69

Little Mouse $70

The Mouse Systems "Little Mouse" 14" Sony Trinitron Picture Tube
640 x 480 resolution
Works with 24-bit cards
Only $599 complete

NEW!!
QuickTel 4800 Baud SendFax and Data modem w/software $1200
QuickTel 2400 Baud modem with software $1099
1-800-222-2808
4451-B REDONDO BEACH BLVD. LAWNDALE, CA 90280
MAIL ORDERS AND P.O.'S PLEASE CALL FOR MOST CURRENT PRICES.

1. Lowest prices.
2. Toll-free Customer Service.
3. Free shipping by UPS
4. Qualified personnel will help you find the right products.
5. Our Corporate Sales Office welcomes Educational, Corporate and Aerospace Purchase Orders.

**NEW** $499

### FM WAVES

**NEW RELEASE**

- Quality C64 Art on CD and Floppy
- CD Version - 360 Mo
- WAVE F1 & F2 - Any Wave

**NEW LOW PRICE!**

- HP PaintWriter XL
  - Up to 16.7 million colors
  - Supports Appletalk
  - Now only $799

- HP DeskWriter
  - 300 dots per inch resolution
  - Supports Appletalk and serial
  - Now only $699

**OUR POLICIES**

- C.O.D. orders and P.O.'s are not accepted.
- Orders under $50 are subject to a $5.00 handling charge.
- All prices subject to change without notice.
- Credit cards accepted: MasterCard, Visa, Check, and Money Order.
- Prices do not include freight.
- All sales final.
Personal Service • Lowest Prices
Money Back Guarantee

Software

ABRACADATA
Design your own Home Landscape, Architecture or Interiors ............. 58
ADOBE SYSTEMS
Adobe Illustrator 3.0 ......................... 339
Adobe Type Manager ......................... 55
Adobe TypeSuite 1.0 ......................... 59
Adobe Type Align .................. 58
Streamline 5 ................................ 324
Photoshop ................................ 589
MACROMEDIA
Master Tuner ................................ 55

DATAUCH $175
New information sharing software breakthrough. DataClub eliminates
networking growing pains with mainframe power, virtual server,
network optimization, parallel processing, AFP compliance, 9
security levels & PC access. No
dedicated hardware required.

CUSTOM APPLICATIONS
Freedom of Press ......................... 249
DETA POINT
DataGraph ................................ 105
DIGITAL IMPACT
Smartaik/V Mac .................. 119
DREAMMAKER SOFTWARE
Fortune Vol. 1, 2, 3 .................. 165
MacGallery ................................ 26
DYNACOM
DynaPerspective 3D .................. 679
FARRUGIO
Timbuktu ............................... 98
Timbuktu Remote .................. 126
FRANKLIN SOFTWARE
Language Master .................. 57

DESIGN YOUR HOME $59
(Architecture, Interiors, Landscape)
Now you can easily design and print
color plans for your dream house.
Design your own home with
Architecture. Design your inside with
Interiors and do your perfect exterior with
Landscape.

ALDOUS
PageMaker ................................ 499
Freewrite 2.0 .............................. 319
Persuasion ................................. 191
ALL IN
Shortcut 1.5 ................................ 45
ASC
Fireguard 2.5 ................................ 127
ASHLAR
Anshav/Select .................. 655
ASHTON TATE
FullWrite (Get Full Impost FREE) ...... 138
Full Impact (Get FullWrite FREE) ...... 135
AVERY
LabelPro .................................. 47
Labels Available CALL
BRODERBUND
TypeStar! ................................ 112
Where in Time is Carmen Sandiego $29
CAERE
OnLine/Page ................................ 499
CENTRAL POINT
Mac Tools Deluxe ......................... 72
CERES
Inspiration ................................ 115
CE SOFTWARE
QuickMail 10 User .................. 298
QuickKeys ................................ 95
QuickLink 4.0 ............................. 54
CHIPSOFT
PilotStar Personal/1040 ............... 52
CLARIS
MacWrite II ........................... 139
FileMaker Pro ......................... 203
MacDraw II(including ATMs) .... 275
ClarisCard .................. 629
Smartiform Designer ............... 279

INSPIRATION $115
The easiest way to brainstorm and
organize ideas, mind-maps, information,
create tree charts, process flows or
basic presentation visual. INSPIRA-
TION combines easy-to-use graphi-
cal diagramming and powerful outlining.

FREEFORM
White Knight .................. 61
HYPERPRESS
PictureLink .................. 141
ICOM SIMULATIONS
On Cue ................................ 34
TQM .................................... 85
INNOVATIVE DATA DESIGN
Dreams ................................ 315
InkDraw ............................... 185
INSIGHT DEVELOPMENT
MacPrint ................................ 89
INZIGMA
Soft PC ............................... 242
INTL BUSINESS SOFTWARE
DataTouch .................. 175
LANGUAGE SYSTEMS
Fortran with MPW .................. 398
Wild Things .................. 119
LAYERED SOFTWARE
AlOnce ................................ 275
LEXTERTIP
MacProof .................. 104
MACROMEDIA
Macromind Director ............... 435
Accuplate .................. 125
MAGNA
Empower I .................. 19
Empower II .................. 213
MANAPRO
Card Shot Ledger ............... 488
MICROMAP
Carbon Copy Mac .................. 115
Virex .................................. 55
Virex Plus Pack ............... 345
MICROFRONTIERR
Enhance .................. 229

FONTSHARE $125
Now all Adobe on a network can share
downloadable Laser fonts residing in
any network file server. Imaging the
disk space, not to mention the money,
you'll save by not needing a dedicated
disk drive for each workstation or
printer. Compatible with both, and
includes 10 FREE fonts and the N-
FONT™ utility.

POWER UP
Address Book Plus ............... 51
Address Book Plus with Binder/Calendar Editor .................. 28
EyeEdit .................. 166
PREFERRED PUBLISHING
Email ................................ 55
Exposure Pro .................. 49
PRE-PRESS TECHNOLOGIES
SpeccySeqs-Quark/Pagemaker .................. 195
Specian .................. 299
CMS ............................... 89
UltraScript .................. 114
QUARK
QuarkXPress .................. 599
QuarkXPress .................. 146

PRESENTATION $49
A 2400 bps data modem! A 9600 bps
SEND/RECEIVE fax includes Maxfax
telecomm software and its many exclusive
features including network file server, plus MacKNOWLEDGE™
communications software and a
Macintosh cable. Complete
communications package!

REALITY TECHNOLOGIES
WeathrBuilder .................. 142
SAJEN
DeskDoubler .................. 42
SERIOUS CORP.
Serious Programmers ............... 184
Serious Developer ............... 324
SITKA
Network Bundle for Mac ............... 179
Network Bundle for DOS ............... 149
SOFTWARE
ASK Forms Designer ............ 161
Business Expense Reports ............... 47
MacTax .................. 56
Personal Tax Analyst ............... 64
Quarterly Payroll Tax ............... 64
3 States available CALL
SOFTWARE DISCOVERIES
Record/Egger Plus .......................... 78
SOFTWARE VENTURES
Microphone II ............... 209
SOLUTIONS INTERNATIONAL
Smartcorp .................. 46
SuperScribe II .................. 69
The Curator .................. 69

STRADA
StrataView3D ........................ 348
STUDIOGRAPHICS
STUDIOGRAPHICS .......................... 209
SUPERMAC
Pixel Paint Professional ............... 385
Pixel Paint .................. 226
SYNTRAX
Norton Utilities .................. 79
SIM ............................... 104
TACTIC SOFTWARE
Cin/Go/Win .................. 159
Clay/Voyant .................. 45
Cin II .................. 45
Sound Clips .................. 45
AntiChips .................. 45
Analogics .................. 45
FontShare .................. 126
TELETYPESETTING
TiScript .......................... 89
TIMEWAVE
Publish II Mac .................. 219
Publish II Mac Easy ............... 109
T-MAKER
Write Now .................. 115
TicklePig .................. 22
VERTICAL SOLUTIONS
FastMail .................. 33
FastEnvelope .................. 48
VISUAL INFO DEVELOPMENT
Presentation Plus .......................... 1715
WORDPERFECT CORP.
Presentations .......................... 308
ZEDCOR
Desk .................. 209

Corporate Medical Plans: Open an account within 24 hours
Volume discount pricing
School purchase orders accepted

Super SIMMS Sale! $49
00 nanoseconds
Takes Care of You!

Hardware

WEALTH Builder ................................ $142

Apple

Mac Systems - Lowest Pricing Call

CALL US

Apple Interfax Fax/modem 24/96 ........ 358
205 Gray Scale Scanner $299387 Pittsburgh Laser Printer 1995

ABCOM

Extended Carry Case for SE .......... 76
Card Case for Mac Ile or ImageWriter 76

ANIMAS

True Color Hand Scanner ............ 562

CAERIE

The Typist ................................ 495

CYBER SYSTEMS

Gater Box ................................ 1890
Gater Box 5 1/2 "3" for Mac II 432

COMPATIBLE SYSTEMS

Ether Route ............................ 1045
Ether Plus ................................ 348
Ether II ................................... 318

DART PRODUCTS

Toner ZipKit ............................. 34

TRUECOLOR HAND SCANNER $562

The first affordable 24-bit True Color Hand Scanner for all your color graphic applications. Includes ColorScan MacCheese and Read It CCR software, so why settle for black & white. Three year warranty.

Policies

- Visa, Mastercard & Amex accepted.
- Credit card is not charged until order is shipped.
- California residents add 6.75% sales tax.
- Hours: Mon - Fri 9:30 - 11:15 EST
- Sat 11:16 EST
- Call (818) 501-6581, FAX (818) 501-3760
- Compatibility not guaranteed.
- All prices & policies subject to change without notice.
- Shipping: 3-5 business days continental US. Hardware over 10 lbs will be shipped ground.
- Same day shipping.
- Call for R.A. number before return.
- Return shipping is at customer's expense. No exceptions.
- Money Back Guarantee: Most products have a 30-day money back guarantee. Please inquire when you order.

INTERNATIONAL RESSELLER PROGRAM

- We ship regularly to 45 countries worldwide.
- Call about our special pricing.

For the LOWEST mail order prices, call...
(800) 825-6227 from the US & Canada
FAX (818) 501-3760 or (818) 377-7865

TURBOTAX PERSONAL/1040 ....... $52
New for the Macintosh. It's the easiest-to-use and most complete software for preparing individual tax returns.

RADIUS

19" Two Page Display ........ 969
Pivot Display .................. 735

RASTEROPS

FULL LINE AVAILABLE ...... CALL

RECORD HOLDER PLUS ....... $78
The one non-reliant data manager that makes full use of the Macintosh interface. It includes all the graphics capabilities and data managing options you'll ever need, plus an easy-to-follow tutorial, and over a hundred help screens.

SHARP

JX-450 Color Scanner & Int. ........ 2195
JX-300 Color Scanner & Int. ....... 2355

SIMM'S

1 Meg, Simms 100, 80, 120, 140 ... Call
128 Meg Color Monitor ........... 669

SUPRA

4200 baud External Modem .......... 169

TOTAL SYSTEMS

Gemini 02/030 16MHz 020 ........ 692
Gemini 02/030 16MHz 030 ......... 861
Gemini 02/030 16MHz 030 2.00 ... 117

14542 Ventura Blvd., Suite 200
Sherman Oaks, CA 91403
(818) 501-6581
Federal ID# 95-4183196
railgun '030' accelerator

With new accelerated SCSI!
We can give your Mac new speed and performance with our Magic Railgun Accelerator for the Plus, SE, & Classic.

$39

1 MB SIMMs

$39

70, 80 ns. lifetime guarantee
1 MB fox SIMMs.............$46
4 MB SIMMs................$225
4 MB fox SIMMs.............$225
3 MB Portable RAM...........$89
Portable RAM 1-8 MB...call
4 MB Classic upgrade........$199

magic upgrades

Our Magic upgrades can give new life to your old Mac 128k or 512k. Update the Mac's memory. drive, add a SCSI port, or expand your Mac's memory.

Magic SCSI ......................$69
128k-512k upgrade............$149
512k-1 MB upgrade.............$295
512k-2 MB upgrade.............$295
512k-4 MB upgrade.............$399

magic fax modems

Magic Fax Modems include a two year warranty and are all 100% Hayes compatible.
2400/1200/300 baud. Auto answer/dial............$75
V.42 bis MNP-5 Modem
2400 baud- send and receive up to 9600 baud. LAPM & MNP error correction, asynchronous operation, automatic adaptive equalization, line impedance matching, and AT command set. Two year warranty.
V.42 bis MNP-5 Modem..................$199

Magic Fax modems

Two year warranty. 100% Hayes & Group 3 compatible
2400/4800 Send/Fax Modem ......................$99
2400/5000 Send/Fax Modem .....................$119
2400/5000 Send & Receive......................$179

applied engineering

MacRam Portable
3 or 8 MB RAM expansion cards
$1250/$3415

quadralink

No bus expansion card- adds 4 additional slots to a Mac
$189

16 MHz Railgun for the Plus, SE, Classic .............$499
25 MHz Railgun for the Plus, SE, Classic .............$799
33 MHz Railgun for the Plus, Classic .............$1199

afterburner accelerated math coprocessor...........$49

1.800-MAC-DISK

Please circle 132 on reader service card.
“Think of us as jolly old St. Mac.” –Mac

FullWrite 1.5 $159.
Ashton-Tate Get high-quality output without sacrificing ease-of-input. Watch text flow around irregularly shaped graphics with version 1.5’s page layout power. Easy for beginners, hard to outgrow. Buy Full Write 1.5 and get Full Impact 2.0 free from Ashton-Tate!

Full Impact 2.0 $159.
Ashton-Tate Magically transform mere numbers into visually dramatic presentations. Version 2.0’s compatibility with Excel, Lotus 1-2-3, and the dBASE family protects your current investment. Buy Full Impact 2.0 and get FullWrite 1.5 free from Ashton-Tate!

QuickMail 10-User Pak $308.
CE Software Here are a few reasons why Mac picked QuickMail for his Place: Application integration, OM to OM Bridge, Remote Access, Conferencing & Voice-Mail capabilities, & file enclosure/sharing, just to name a few. Mac says "Check it out. Call Today!"

“Popcorn with each shipment. Free!”
At Mac’s Place, the only packing material we use is popcorn. Plain, unburned, unsalted, somewhat stale popcorn. It’s better for the earth, it’s better for the corn farmers, and it’s even good for the birds. We may not be in the popcorn business, but we are in the business of providing you with the best Macintosh service available. We think that includes taking better care of the world we live in.

Colorset 1.5 $225.
Studiotronics Revolutionary product that allows GS scanners to scan color images, edit and, save color images as 8, 16, or 32 bit PICT and color TIFF files. Comes with ShowScan™, an XCMD for HyperCard that displays color images in stacks.
Even the big guy knows he can count on Mac's Place.

Help the homeless have happier holidays.
During this holiday season, we're giving $3 to homeless programs for every order of $150 or more. It's our way of making this special time of year a little brighter for people whose lives have more than their share of darkness. Even if you don't order from us, we encourage you to donate to worthy causes in your community.

Mac's Place

Our Hours: Monday through Friday 6AM-10PM PST and Saturday 6AM-6PM PST
Call 1-800-367-4222 US & Canada
"We’ll be in time for Christmas." —Mac

**CompuServe**

Macintosh Membership Kit $22.

Thanks to CompuServe's new Information Manager software, you can use CompuServe with windows, pull down menus, dialog boxes, and easy commands. Better than ever, CompuServe now links you with over 500,000 interactive users.

---

**Mac’s Policies**

- **YES, MASTERCARD and AMERICAN EXPRESS gladly accepted.**
- **Your credit card is never charged until your products ship.**
- **When we must ship a partial order, no additional freight is charged for shipments that complete the order $5.00 only.**
- **Most items carry the manufacturer’s 30 or 60 day Money Back Guarantee (MBG). Mac’s Place has a 30 day MBG on all hardware (USA Only). Ask for details when ordering.**
- **90 day limited warranty on all products, some hardware items have a one or two year warranty. Defective software is replaced immediately with like item). Defective hardware items repaired or replaced at our discretion. Loan drives subject to availability (in USA Only).**
- **Most personal and company checks approved upon receipt to insure immediate shipment. Allow one week for check over $1,000.**
- **Government, School and Institutional P.O.’s cleared immediately (some corporate accounts require credit approval, please call).**
- **No sales tax (except WA residents add 8.1% to retail, including shipping).**
- **All returns must have an authorization number. Please call 800-367-4722.**
- **All prices & promotions subject to change without notice. All items subject to availability. Not responsible for typographic errors.**
- **Orders USA: Orders placed weekdays by 3:00 pm E.S.T. 9:00 pm P.S.T. for “in stock” items ship same day (baring system failure, etc.) for overnight delivery via Airborne Express. Rural locations may require an additional day for delivery. Areas not served by Airborne will be sent U.S. Postal Service or UPS. Alaska, Hawaii orders ship UPS 2nd day air. Our $3.00 shipping charge includes insurance on no extra charge.**
- **International Orders: Call 206-881-3212. Ship worldwide through the free world. Contact Mac’s Place for information. Mail, Tax or electronic orders greatly accepted.**

**Electronic Mail Orders:** CompuServe (7655,560); Genie (MACSPACEM); America Online (MacPlace). Mac’s Place uses CE Software’s DraftMail™ to check our mail each hour.


Mail: 8461 154th Ave NE, Redmond, WA 98052.

© 1990 Mac’s Place, Inc.

---

**Strategic Conquest 3.0/Spaceward Ho! $35 ea.**

**Delta Tao Software**

The two best strategy games ever. Explore and conquer the world of Strategic Conquest or the galaxy of Spaceward Ho! against the computer or human opponents on a AppleTalk network. From the makers of Color MacCheese.

---

**BaseLine Publishing**

**...30 day MBG**

**INIT Manager™** — Locate, reorder, manage and analyze all your start-up documents, $36.00. **Color MacCheese™** 1.05 — First affordable 32-bit color or grayscale paint program, $59.00. **Talking Moose™** — Humor for the Mac, 24.00.

---

**Thunderscan $365.**

**Thunderware**

In one quick pass, scan graphics and text from books, newspapers or any flat surface. Rated #1 hand-held scanner by MacWorld, MacUser, Publish! and Personal Publishing. Includes ThunderWorks software, DA, controller, and SnapGuide.

---

**Fuji Disks Check Listings**

Trust your data to tested and certified Fuji disks. Ease organization with the brightly colored Rainbow pack, or pack more data away on Fuji High Density disks.

---

**Call 1-800-367-4722 or Fax your P.O. 1-206-881-3090**
Macintosh Personal 1991 $64.
Softview The best selling tax product for the Macintosh. The award winning Macintax will help you gather, organize and complete your taxes-ready to submit to the IRS. Full integration with 13 state supplements.

Résumé Expert $49.

FastLabel & Fast Envelope $45 ea.
Print any label or envelope on any printer! These desk accessories import text and graphics from almost any application. Use preformatted templates or create your own! Cut and paste your entries, type them, or import and save your lists.

Ikegami Monitors
Maxi-Sync CN-20 $1980.
Super high resolution color monitor. Combine reliability, compact design, & incredible price advantage all within an auto-frequency solution. Up to 1280 X 1024 resolution! Ask about the Generation X V8/II color video card for $648.00. See listings for other incredible deals from Ikegami & Generation X!

‘Deck the halls with great new software.”—Mac

Darwins Dilemma $31.
Climb the evolutionary tree in full living color. Follow the origin of the species through an intriguing puzzle of increasing complex life forms that collide and merge as they evolve. Biology majors beware: this addicting game will even stump you!

Darwin’s DILEMMA

‘You can even string the popcorn on your tree.”—Mac

Macintax Personal 1991 $64.
Softview The best selling tax product for the Macintosh. The award winning Macintax will help you gather, organize and complete your taxes-ready to submit to the IRS. Full integration with 13 state supplements.

Résumé Expert $49.

FastLabel & Fast Envelope $45 ea.
Print any label or envelope on any printer! These desk accessories import text and graphics from almost any application. Use preformatted templates or create your own! Cut and paste your entries, type them, or import and save your lists.

Ikegami Monitors
Maxi-Sync CN-20 $1980.
Super high resolution color monitor. Combine reliability, compact design, & incredible price advantage all within an auto-frequency solution. Up to 1280 X 1024 resolution! Ask about the Generation X V8/II color video card for $648.00. See listings for other incredible deals from Ikegami & Generation X!

Darwins Dilemma $31.
Climb the evolutionary tree in full living color. Follow the origin of the species through an intriguing puzzle of increasing complex life forms that collide and merge as they evolve. Biology majors beware: this addicting game will even stump you!

Darwin’s DILEMMA

‘You can even string the popcorn on your tree.”—Mac

Macintax Personal 1991 $64.
Softview The best selling tax product for the Macintosh. The award winning Macintax will help you gather, organize and complete your taxes-ready to submit to the IRS. Full integration with 13 state supplements.

Résumé Expert $49.

FastLabel & Fast Envelope $45 ea.
Print any label or envelope on any printer! These desk accessories import text and graphics from almost any application. Use preformatted templates or create your own! Cut and paste your entries, type them, or import and save your lists.

Ikegami Monitors
Maxi-Sync CN-20 $1980.
Super high resolution color monitor. Combine reliability, compact design, & incredible price advantage all within an auto-frequency solution. Up to 1280 X 1024 resolution! Ask about the Generation X V8/II color video card for $648.00. See listings for other incredible deals from Ikegami & Generation X!

Darwins Dilemma $31.
Climb the evolutionary tree in full living color. Follow the origin of the species through an intriguing puzzle of increasing complex life forms that collide and merge as they evolve. Biology majors beware: this addicting game will even stump you!

Darwin’s DILEMMA

‘You can even string the popcorn on your tree.”—Mac

Macintax Personal 1991 $64.
Softview The best selling tax product for the Macintosh. The award winning Macintax will help you gather, organize and complete your taxes-ready to submit to the IRS. Full integration with 13 state supplements.

Résumé Expert $49.

FastLabel & Fast Envelope $45 ea.
Print any label or envelope on any printer! These desk accessories import text and graphics from almost any application. Use preformatted templates or create your own! Cut and paste your entries, type them, or import and save your lists.

Ikegami Monitors
Maxi-Sync CN-20 $1980.
Super high resolution color monitor. Combine reliability, compact design, & incredible price advantage all within an auto-frequency solution. Up to 1280 X 1024 resolution! Ask about the Generation X V8/II color video card for $648.00. See listings for other incredible deals from Ikegami & Generation X!

Darwins Dilemma $31.
Climb the evolutionary tree in full living color. Follow the origin of the species through an intriguing puzzle of increasing complex life forms that collide and merge as they evolve. Biology majors beware: this addicting game will even stump you!

Darwin’s DILEMMA

‘You can even string the popcorn on your tree.”—Mac

Macintax Personal 1991 $64.
Softview The best selling tax product for the Macintosh. The award winning Macintax will help you gather, organize and complete your taxes-ready to submit to the IRS. Full integration with 13 state supplements.

Résumé Expert $49.

FastLabel & Fast Envelope $45 ea.
Print any label or envelope on any printer! These desk accessories import text and graphics from almost any application. Use preformatted templates or create your own! Cut and paste your entries, type them, or import and save your lists.

Ikegami Monitors
Maxi-Sync CN-20 $1980.
Super high resolution color monitor. Combine reliability, compact design, & incredible price advantage all within an auto-frequency solution. Up to 1280 X 1024 resolution! Ask about the Generation X V8/II color video card for $648.00. See listings for other incredible deals from Ikegami & Generation X!
“When you place an order you’ll hear

Intersect CDR 35
Portable CD ROM Reader $459
N EC This compact and lightweight (2.2 lb) reader delivers the dependable performance of full-size readers and full CD-ROM capability at an affordable price. Includes Interface Kit.

Type Gallery
CD ROM Call
For Incredible
Low Price
N EC Turn your Mac into a type house. Type Gallery PS lets you access over 500 Adobe PostScript typefaces from a single CD-ROM disc. The most convenient and affordable way to buy type. Call for details now!

Wayzata Tech Call

Mac Golf Classic $52.
Premium edition of MacGolf™ with vivid full screen color graphics and unsurpassed screen image detail. Six courses, five enlargement options for close up viewing, nine practice greens, a driving range, and much more. Min. req., Mac Plus.

Daystar Digital
Powercache Ic!i $109/ FastCache Ic!i $269 Get an economical boost with the Fast Cache Ic!i. Make your Mac faster than a Iiff with the new 50 MHz PowerCache Ic!i. Daystar cache cards deliver the speed you need at a price you can afford. See listings for other Daystar products.

MacPlace
Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

“Have a Merry Mac and
**FILE GUARD 2.5 $139**

ASD Protect your hard drives, applications, files, and folders (including the System) from unauthorized access and deletion. Includes audit trail capability. Also available in five- or ten-user office packs.

**Lottery Tracker & Wheeler $25.**

Most comprehensive lottery software program on the market today for Pick-6 Lottery games. Record and track hundreds of past winning numbers and dates, produce expert trend charts for hot and due numbers, and much more!

**Studio 32 $455.**

New! Created for graphic designers, DTP media specialists, and video professionals. True 32-bit technology offers unlimited possibilities for creative expression. Intuitive interface performs the way artists think and work. Works in 8, 16, 24, and 32 bit color.

**C•A•T•E Trial Kit $10**

Chang Labs, Inc. If your success depends on the number of contacts you make and your ability to track, cultivate, or service them, this powerful new software is for you. Call for a demo today.

**MacPro Keyboard $124.**

Keytronic Increase your productivity with Keytronic's ADB compatible keyboard. Features extended-style layout, dual-legend keycaps, and free Tempo II™ macro software. Backed by a three-year warranty.

**Happy New System.” —Mac**
**I’m dreaming of a 32-bit color Christmas** —Mac

**SIMMS Call**
Expand the mind of your Mac One megabyte SIMMS at incredible prices! 80 nanoseconds or faster. Includes the most complete installation manual available. SIMMS for all Macs including IIx, cl, ci, LC and Classic. Get your Mac ready for System 7—call today for pricing!

**Script Edit 2.0 $62**
Somak All new for HyperCard 2.0, this powerful editor has multiple clipboards and modeless operation, plus "smart" Hypertalk menus, handler/function pop-ups, GREP searching, integrated debugger with recorder, and much more. Includes HyperCard 2.0

**Daystar Digital**
256K PowerCache lxi ........................ 189.
Fast Cache lxi 54K ........................ 269.
PowerCard CDR Accelerator ............... 498.
25 MHz for Mac II ........................ 1078.
25 MHz for Mac II ........................ 1078.
40 MHz for Mac II ......................... 1259.
33MHz for Mac II ......................... 1439.
33 MHz for Mac II ......................... 1439.

**Dove**
Dovefax Desktop ............................ 269.
Dovefax Desktop ............................ 269.
SMS 524 (512K to lmb) ..................... 179.
SMS 524E (512K to 1mb) .................. 229.
548 (512K to 2mb) ......................... 415.
548S (512K to 2mb) ....................... 415.
548S (512K to 2mb) ....................... 415.
SCSI Port Adapter .......................... 109.
Marathon ................................. 239.
88030 for Mac IX ......................... 439.
88030 Plus ............................... 445.
88030 MultiComm ......................... 215.
88030 for Mac II ......................... 239.
88030 for SE ............................. 435.
Racer ................................. 146.
88030 Parallel/Serial ...................... 189.

**Everex**
Emac 20II (3mb Backup) .................... 545.
BMAG 128MB Tape Backup .................. 778.
BMAG 128MB Tape Backup .................. 778.

**Farallon**
MacRecorder 2.0 ......................... 158.
MacRecorder Voice Digitizer .............. 86.
Flash Card 30B (DOS) ...................... 319.
Moda Tracks MM Pack ..................... 319.
Moda Media Pack CD ...................... 319.
Moda Media Pack CD ...................... 319.
PortaPack ......................... 325.
Remote/9600V2/Model Pack 899.
Din-8 ......................... 28.
Din-8 ......................... 30.

**DeltaGraph 1.5 $109**
DeltaPoint Software Powerful, easy-to-use, 2- and 3-D charting program featuring 25 chart types, automatic overlays, drawing tools, full color and extensive export/export. Transform your data into dazzling charts and presentations with DeltaGraph!

**Casino Master**
Color $48. B&W $42.
Entertainment On-Line. Count cards and choose the rules of your favorite Casino. Casino master lets you play your way. Craps, Roulette, Blackjack or Poker—straight from the big Casinos to your mouse, by Centron.

**WealthBuilder **$145.
Reality Technology Designed for the individual investor and perfect no matter what your level of expertise. Gives you objective information on up to 1200 mutual funds and 10,000 stocks and bonds. Earn more by investing wisely and saving more effectively!

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090
“Think of it as hard drives a la carte.” —Mac

**HARD DrIVES**

At Mac’s Place, we’ve come up with a sure fire way to make sure you get exactly, precisely the hard drive that’s perfect for you. Instead of ordering a pre-packaged drive, we let you specify the components you want. Then we put it all together for you.

This way you can get an internal or external drive with the capacity and mechanism you want. Even specify the kind of case you want for your external drive.

We assemble, format, and test the whole thing and ship it to you overnight. **And guarantee it for one or two years.** So create your drive using the components listed. And, as always, if you have even the slightest little question, give us a call.

**ACCESSORIES**

**After Dark 2.0** $20.


**File Force** $245.

**ACIUS** Designed for the first time database user, this is the ideal filing system to keep track of and organize the details of your life. Features include report generator, graphing, mail merge capabilities, and ready-to-use templates.

**Goldstein & Blair** Macintosh Bible 3.0 .......... 19
**I/O Design** MacLatch Ultimate Norelco, Yellow, or Green .......... 89
**Ultimate SE Black or Navy .......... 79
**Rensington MicroWare** Apple Security System Macsty# Stand With/End/Label .......... 64
**Mediastation Anti-Glare Filter .......... 52
**Super Sleek .......... 39
**Tilt Stand .......... 22
**Turbo Mouse (512k & Plus) .......... 107
**Super Mouse Adp. .......... 107
**Corkys** MacPro 105 ADB Keyboard .......... 115
**Kraft** Premium III ADB ........ 49
**KM 30 ADB .......... 49
**Quickstick (512k & Plus) .......... 39
**Kraft** ADB/122/122 Tab W/Style ...... 384

**Power Key** w/Quick Keys Lite $64.

**Sophisticated Circuits** Turns on your Mac and peripherals from the keyboard and shuts everything down from the Special menu. Can be programmed with an on/off schedule. Great for communications and backups. Four outlets provide surge and overload protection and noise filtering, SE and II compatible.

**Turbo Tax Mac** $52.

ChipSoft introduces TurboTax Personal/1040 for the Macintosh. The easiest-to-use and most complete individual tax preparation software. TurboTax provides on-line help, IRS instructions and comprehensive tax assistance. Eleven companion TurboTax/State programs available separately.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

with every order.” —Mac
To make your Mac more affordable, we offer financing or lease plans to fit your budget. To make your Mac more effective, we offer custom system configurations.

**1-800-MAC STUF**

### MAC II fx
- III, 4mb RAM, 170mb Quantum, RasterOps 19 Color Monitor, 8-bit Color, Datadesk Switchboard
- **$11,499**
  - **$281/mo.**

### MAC Iici
- Iici, 5mb RAM, 105mb Quantum, IKEGAMI Color Monitor, 8-bit Color, Keytronic 105 Keyboard
- **$7,459**
  - **$142/mo.**

### MAC Iici
- Iici, 8mb RAM, 170mb Quantum, NEC 14" Color Monitor, 8-bit Color, Apple Extended Keyboard
- **$5,799**
  - **$140/mo.**

### MAC SE/30
- SE/30, 5mbRAM, 105mb Quantum, Keytronic 105 Extended Keyboard
- **$3,639**
  - **$89/mo.**

### MAC CLASSIC
- Classic, 2mb RAM, 40mb Hard Drive, FDHD, Standard Keyboard
- **$1,279**

---

Texas Residents Add 8%. All products shipped UPS unless otherwise specified. * All products returned are subject to a substantial restocking fee. Returns must be in original condition and package. Said must not be open or software products. No returns on opened software. No returns on damaged equipment. Returns will not be accepted without a Return Merchandise Authorization number. All prices subject to change without notice. * Subject to availability.

© 1990 CC Corporation. All Rights Reserved. Texas MacStuf and MAC STUF are trademarks of CC Corporation. Apple and Macintosh are registered trademarks of Apple Computer, Inc. Photos Courtesy of Apple Computer.
LEASING, YOU CAN SAVE $$$.

HARD DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantum ProSeries</td>
<td>40 MB</td>
<td>$239</td>
<td>$378</td>
</tr>
<tr>
<td></td>
<td>80 MB</td>
<td>$499</td>
<td>$584</td>
</tr>
<tr>
<td></td>
<td>160 MB</td>
<td>$749</td>
<td>$834</td>
</tr>
<tr>
<td></td>
<td>330 MB</td>
<td>$1,198</td>
<td>$1,398</td>
</tr>
<tr>
<td></td>
<td>660 MB</td>
<td>$1,998</td>
<td>$2,198</td>
</tr>
<tr>
<td></td>
<td>1 GB</td>
<td>$3,294</td>
<td>$3,494</td>
</tr>
<tr>
<td>CDC Imprimis Wren</td>
<td>300 MB</td>
<td>$1,559</td>
<td>$1,698</td>
</tr>
<tr>
<td></td>
<td>330 MB Win Runner</td>
<td>$1,798</td>
<td>$1,998</td>
</tr>
<tr>
<td></td>
<td>600 MB</td>
<td>$1,998</td>
<td>$2,198</td>
</tr>
<tr>
<td></td>
<td>800 MB</td>
<td>$2,198</td>
<td>$2,398</td>
</tr>
<tr>
<td></td>
<td>1 GB</td>
<td>$3,998</td>
<td>$4,198</td>
</tr>
</tbody>
</table>

NEW! Cork External Hard Drive CASES

- Seagate 20 MB: $259
- Seagate 30 MB: $299
- Pinnacle REG - 650: $379

DISKETTES

- 3.5" DD Time-savers with a lifetime guarantee:
  - 10-PACK: $9.99
- 105 MB: $499
- 170 MB: $749
- 210 MB: $889

- 152 MB: $339

NEW! Cork External Hard Drive CASES

- 300 MB: $1,559
- 330 MB Win Runner: $1,798
- 600 MB: $1,998
- 800 MB: $2,198
- 1 GB: $3,294

PRINTERS

- QMS PS-410/810 ColorScript100
  - Call: $7659

- Hewlett Packard Deskwriter
  - $99
- Kodak Dcrosk Ink Jet Printer
  - $499
- NEC Silentwriter 2 290
  - $2,999
- NEC Silentwriter 2 90
  - $1,825
- NEC Colormate PS
  - $698
- Matsushita Imagent TII II Clone
  - $199
- Gume Crystal Print Publisher1
  - $2,999
- Gume Crystal Print Express
  - $3,499
- TI MicroLaser PS 17/35
  - $1,729/1999

VIDEO SOLUTIONS

- Speedview Tabloid Sized Monitor
  - The #1 choice for ad and page layout
  - NEW! 21-inch portrait monitor displays full tabloid page (60 picas wide, 14" deep) without scrolling or reduction. Built exclusively for DTI by Sigma Designs, the Speedview is compatible with all standard Mac software.
  - Monochrome:
    - GrayScale: $329
  - DTI AdPlanner: $795
  - The powerful page-dummying system
  - Saves time and money for any publication carrying ads by providing computer-assisted page planning. Replicates prepares and plans ad-dummy jobs to as little as 15 minutes.

EXPANSION CHASSIS

- Call $7659

- NewLife accelerates and upgrades your old Macs
  - Includes: NewLife 25/NewLife 25 SE System upgrade brings your 128K SE to a 68K processing power
  - $1,399/$1,399
- NewLife 1/NewLife 2 CPU Upgrade
  - Changes your 128K 512K to the capabilities of a 68K
  - $249/$39
- NewLife 33 SE System Upgrade
  - Upgrades your SE to a near 68K performance
  - $2,500

ACCELERATORS

- NewLife accelerates and upgrades your old Macs
  - NewLife 25/NewLife 25 SE System Upgrade brings your 128K SE to a 68K processing power
  - $1,399/$1,399
- NewLife 1/NewLife 2 CPU Upgrade
  - Expands your 128K 512K to the capabilities of a 68K
  - $249/$39
- NewLife 33 SE System Upgrade
  - Upgrades your SE to a near 68K performance
  - $2,500

DON'T PAY FOR A 900 NUMBER CALL WHEN YOU CAN CALL MACSTUF FOR FREE.

Please circle 173 on reader service card.
Transfer MacWrite, Word, Excel or most any other files between the Z88 and your Macintosh!

CAMBRIDGE Z88 Computer

Complete Z88 Systems
Start at $429
Includes: File Transfer software, cable, additional memory, and 4 AA batteries.

Nothing else to buy!
Call 800-535-3252
Try It For 21 Days At NO Risk! Call Today and SAVE!

Please circle 407 on reader service card.

Total Value, Hardware, Annual
Media & Purchased Software Premium
up to $2,000 $ 49
$2,001 - $5,000 $ 69
$5,001 - $8,000 $ 89
$8,001 - $11,000 $109
$11,001 - $14,000 $129

Subject to underwriting and availability by state
For immediate coverage, info, and rates on higher coverages, call

25 1-800-848-3469
Local 1-614-262-0559 • FAX 1-614-262-1714
Compuserve “GO SAF” • GEnie “SAFEWARE”
SAFEWARE, The Insurance Agency Inc.
2929 N High St. • PO Box 02211. Columbus, OH 43202

Please circle 150 on reader service card.
To pick this up for $1,799 just pick this up.

We've got it all.
Hardware, software, and systems. From Apple, Reser Ops and Microsoft, just to name a few. In fact, we have over 6,900 items for all your computer needs. Quantity discounts. And prices that leave the other guys guessing.

At the lowest prices.
Just thumb through this magazine until something catches your eye. Then call us for a price on the same item. Even after you add the cost of your phone call at $2/minute you'll still get the lowest price anywhere.

It's no risk. Guaranteed.
On top of our lowest price, best selection offer, we've got a guarantee that will settle the deal. A generous 30 day return on most hardware and software*. So, if it's not just what you need, send it back. You'll get a refund, no questions asked.

So call us.
Just say go. We have $100 million of inventory in 16 warehouses world-wide. So we can ship your order immediately. Call us any time Monday through Saturday, 8 a.m. to 10 p.m. (CST) or order, or even if you're just curious. You'll find out that getting the best price on hardware, software and peripherals from people that really know Macintosh, is as easy as picking up the phone.

*Hardware and software prices leave the International: 100% guarantee and 30 day return. All returns must be in original condition and package. Seal must not be opened on software. Returns may be subject to a restocking fee. Ask for details when ordering. Bottom Line Distribution cannot be responsible for any loss or damage of merchandise after it is shipped.

Fax: 1-900-420-8770
International Fax: 512-469-5678
2021 Guadalupe, Suite 30 • Austin, Texas 78705

1-900-420-3737

FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS • FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS

FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS • FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS

FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS • FREE MAC-ELVIS T-SHIRT FOR THE FIRST 5,000 CALLERS
Five Simple Reasons:

1. Quality: While our products may not be fancy, our cases are all domestically manufactured, none of those questionable-quality Asian knock-offs. They utilize the best auto-switching digital power supplies. Our connectors are all name brands of the finest manufacture, none of those imported imitations. Our drive mechanisms speak for themselves. Quantum, WREN, Syquest, Teac.... Industry standards... the best available.

2. Knowledge: Our helpful, knowledgeable sales associates will help you determine what is the best drive for your needs (not just the most expensive). They'll help you navigate those thorny termination issues, and help you decide the right drive for your particular hardware configuration.

3. Support: Our trained technical associates will help you address any questions you might have about an APS drive. Are you running into conflicts when you use certain combinations of hardware and software? Our technical associates can help you sort through the kinds of problems that plague both the novice and the power user.

4. Service: Absolutely the best in the industry! If we tell you we have it, WE DO! We'll ship your drive when we promise, as we promise. We never charge your credit card until after your order has shipped from our factory. In the unlikely event that you have a problem with your drive, our exclusive ‘30 day performance guarantee’ goes immediately into effect. We'll ship you a new drive over night* and have the suspect drive picked up at our expense. After the first 30 days, our warranty turn-around time is 48 hours (often 24). We'll ship back to you via overnight air - our expense. Our one and two year warranties include a thirty day money-back guarantee. Your toll-free phone call to either sales or technical support is answered by a real person 24 hours a day, none of those frustrating voice mail mazes that you find other places. Our goal is to care for you better and faster than the dealer down the street.

5. Economy: Our prices speak for themselves! APS consistently offers the lowest prices on immediately available inventory in the business. Our pricing is based on assembled, formatted* products with everything you need to plug-n-play. Our external drives are available in externally terminated (with terminator) or internally terminated units. - your choice. Need a Mac to SCSI, or daisy-chain cable? Take your pick, no extra charge. Need multiple units? Don't pay for the same piece of bundled software three times, buy them only if you need 'em. We have outstanding values on several "industry standard" drive utility products at as much as 80% off retail prices!

*Some limitations may apply
**Performance 30 Day Guarantee**

$299* Internal

---

**Quantum 12ms Access**

<table>
<thead>
<tr>
<th>Capacity (mb)</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>299</td>
<td>399</td>
</tr>
<tr>
<td>52</td>
<td>329</td>
<td>429</td>
</tr>
<tr>
<td>80</td>
<td>479</td>
<td>579</td>
</tr>
<tr>
<td>105</td>
<td>499</td>
<td>599</td>
</tr>
<tr>
<td>120</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>170</td>
<td>739</td>
<td>839</td>
</tr>
<tr>
<td>210</td>
<td>899</td>
<td>999</td>
</tr>
</tbody>
</table>

---

**Maxtor**

- **200**
  - 899*
  - 999
  - Under 15 ms average access, very low noise

**Syquest**

- **45 meg**
  - Removable $599
  - Removable With Retrospect $699

- All Include one cartridge + $76 per cartridge for additional cartridges

**Teac 155mb**

- Tape Both With Retrospect $629

**WangDAT**

- All Include one cassette $1999

---

**Dual Drive Combo's**

- **1 gig WREN/WangDAT** $4999
  - 600 mb/WangDAT $3799
  - 600/Teac 155 $2699
  - 600/SyQuest $2599
  - 300/Teac 155 $2049
  - 300/SyQuest $1999
  - 330/Teac 155 $2399
  - 330/SyQuest $2399

---

**WREN Drives**

<table>
<thead>
<tr>
<th>Capacity (mb)</th>
<th>Half Height</th>
<th>Full Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>173</td>
<td>999</td>
<td>1099</td>
</tr>
<tr>
<td>300 mb</td>
<td>1499</td>
<td>1599</td>
</tr>
<tr>
<td>300</td>
<td>1249</td>
<td>1449</td>
</tr>
<tr>
<td>330 (RUNNER)</td>
<td>1499</td>
<td>1699</td>
</tr>
<tr>
<td>425</td>
<td>1899</td>
<td>2049</td>
</tr>
<tr>
<td>600</td>
<td>1849</td>
<td>2049</td>
</tr>
<tr>
<td>630</td>
<td>2199</td>
<td>2399</td>
</tr>
<tr>
<td>1 Gig</td>
<td>2999</td>
<td>3399</td>
</tr>
</tbody>
</table>

**Alliance Peripheral Systems**

9:30am - 7:00pm Central Time
fax: (816) 478-4596 24hrs.

1-800-233-7550

---

- All Drive products carry a 30 day Money-back guarantee.
- Quantum, Maxtor and Syquest Drives carry a two year "parts & labor" disk-for-disk replacement warranty. WREN, Teac, WangDAT and Syquest Cartridges carry a one year "parts & labor" disk-for-disk replacement warranty. All Hard Drives include all brackets, cables and cords and LED's required for operation. All Hard Drives come pre-formatted with Apple's latest stable System software, 12.5 MB of Publicly Distributable software from the BMUG Library, and the "ALLIANCE POWER TOOLS" SCSI formatter/Partitioner.
- Your drive fails to perform properly in the first 30 days and our technical support staff can't solve the problem over the phone, we'll ship you a replacement drive overnight and have your defective one picked up at our expense. Offer is subject to some limitations. Products being returned for credit and international orders do not apply.
MacTel Technology Corp.

Our SIMMs are manufactured in-house at our state-of-the-art facilities.

Index Hard Drives

Quantum 3.5" ProDrive HD
- 2-Year Warranty
- Internal / External
- 40Mb 12ms $359 $439
- 80Mb 12ms $549 $639
- 106Mb 12ms $599 $699
- 170Mb 12ms $629 $919
- 210Mb 12ms $649 $1039

Quantum LP8 Slimline for the 5.25" Internal... $599. External... $699.

Imprimis 5.25" Wren Series HD
- 180Mb 15ms $979 $1069
- 300Mb 16ms $1149* $1599
- 333Mb 17ms $1799* $1999
- 600Mb 16ms $1859* $1999
- 640Mb 16ms $1999* $2099
- 1 Gg 16ms $3099* $3199

DayStar Sale!
Fantastic Prices!
33Mhz PowerCard 030 for the Mac II & IIx...
- Mac, AUX and ProDos compatible formats
- Password protection - simple and encrypted
- Partitioning - with DA controlled mounting
- Disk Mirroring - fault tolerance backup
- Testing - verifies and assigns bad blocks
- User-friendly COLOR interface
- Expert and Novice modes with balloon help features
- Update Drive Button - install "HD Chauffeur" without reinstalling
- BACKMATIC™ - Automatic backup utility
- AUTOSAVE II™ - Protects against Data Loss
- 14mb of Public Domain Software

Surface Mount, Low Profile
- Quantum LP8 Slimline
- 180Mb 15ms $979 $1069
- 300Mb 16ms $1149* $1599
- 333Mb 17ms $1799* $1999
- 600Mb 16ms $1859* $1999
- 640Mb 16ms $1999* $2099
- 1 Gg 16ms $3099* $3199

Index Memory Modules

1Mb $39.50

Surface Mount, Low Profile
- FX 1Mb SIMMs $41
- 4Mb Surface Mount/Low Profile (60ns) $209
- 4Mb Mac IIx SIMMs (80ns) $219

H.D Chauffeur and $250 value Software
Bundle accompanies ALL INDEX Hard Drives

The Index Portrait
15", high resolution, anti-glare monochrome, with tilting base, 640'970 pixels plus a 78Hz Refresh Rate. Includes interface card for Mac SE, SE/30 and Mac II family.

The Index PostScript Printers
- Ti microLaser PS 17/Wid 17 Fonts...
- Ti microLaser PS 35/Wid 35 Fonts...
- AppleTalk Connector Included!

RasterOps
- We carry the complete RasterOps product line - Call for a low price!
- ColorBoard 208
- ColorBoard 264
- 364 Video Card
- ClearVue/GE System for SE/30
- ClearVue/GE System for Mac II
- 8L System
- 24L System
- RasterOps Graphic Accelerator

The Index Memory Upgrade for the Ti microLaser Printer.
Increase printing speed and Download More Fonts $149.

1-800-950-8411

Maclel Technology Corp.

Professional Solutions For Today's Macintosh Professional.

Please circle 39 on reader service card.
Install your Large Hard Drive with a Click of Your Mouse.

Installation of virtually any SCSI drive is easy and only minutes away with Ontrack’s Disk Manager - Mac Hard Disk Installation Utility for Macintosh.

Ontrack, the world leader in disk management software, gives Macintosh users added hard drive options with Disk Manager - Mac. Select the SCSI drive of your choice, and create a Macintosh that is easier to use and less expensive to upgrade.

- Install any SCSI drive: Create customized partitions
- Complete with utilities to manage and secure your data - including password protection and a removable drive option
- Available with or without a hardware installation kit

FREE TECHNICAL SUPPORT!
Technical Support: 612-937-2121
1-800-752-1333
International: 612-937-1107 · Fax: 612-937-5815

Please circle 357 on reader service card.

Food for Thought.

HUNGRY FOR SOMETHING NEW?

Our 7 spectacular volumes of clip art are: Business Cartoons, Agenda For The 90s, Animals, EPS Borders, Fashion, Glamour and Fantasy. There are 60-100 images per volume. All except EPS Borders volume are 400dpi TIFF. TIFF to PICT utility and disk wallet included. Write to: FM Waves 70 Derby Alley, San Francisco, California 94115.

Please circle 377 on reader service card.

Top Drives

Here’s what experts say about our drives

Top Rated! Macworld rates Deltaic’s Server 100H as the best performing midrange hard drive.

Four Mice! MacUser recommends Deltaic’s Server 90 and awards it four mice.

A Favorite! Macworld ranks Deltaic’s Server 300 as one of its favorite large drives.

Performance - Reliability
When you purchase any Deltaic Systems product, from economical 40MB hard drives to our 10GB Optical systems, you always get highly rated quality design and construction.

Support
As an Apple developer, we are able to support you before and after your purchase. Storage selection is more than just comparing seek times; our knowledgeable sales staff can help you with your decision.

Featured Products
Server Series™ Hard Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>100H</td>
<td>Top Rated midrange HD</td>
<td>$999</td>
</tr>
<tr>
<td>320H</td>
<td>New Half Hi-Hi HD</td>
<td>$1799</td>
</tr>
<tr>
<td>420H</td>
<td>New Half Hi-Hi HD</td>
<td>$2199</td>
</tr>
<tr>
<td>320H</td>
<td>18,7 ms seek HD (tunnel)</td>
<td>$1999</td>
</tr>
<tr>
<td>1GB</td>
<td>MacWren HD</td>
<td>$3699</td>
</tr>
</tbody>
</table>

Optical Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>940H</td>
<td>Write Once - perm. archive</td>
<td>$2999</td>
</tr>
<tr>
<td>600H</td>
<td>Rewritable ISO std.</td>
<td>$3999</td>
</tr>
</tbody>
</table>

All drives are complete with premium aluminum zero footprint enclosure, international power supply, push button SCSI select, cables, software and external terminator. All Optical include 1 data cartridge.

Find out why serious users like our drives

VISA, MC, Corp & Educ POs welcome

Order 1-800-745-1240

Please circle 371 on reader service card.
The Modern Art of Networking

Announcing the All New File Sharing Software that Eliminates Network Growing Pains.

Finally, complete relief for network aches and pains. That is, headaches and growing pains. DataClub™ reconfigures your network automatically, so you don’t have to.

DataClub uses the combined power and storage capacity of all the Macintoshs® on your network. Your network actually gets more powerful as it grows! And file sharing is faster than ever. Make your network a work of art with DataClub, the networking masterpiece. Become a member today.

CALL 1.800.733.2822

1270 Oakmead Parkway, Suite 314
Sunnyvale, CA 94086-4034
(408) 522.8000

Please circle 363 on reader service card.

Mainframe Power
You can stack dedicated hardware and create your own super server. However, DataClub doesn’t require any dedicated hardware.

Parallel Processing
Users can access data simultaneously. There’s no network bottleneck, so work gets done faster and productivity increases.

Location Transparency
All users share the same view of the file system. So, finding shared files is fast and easy.

Network Optimization
You can control the location of DataClub files and maximize speed, performance, and productivity.
Centralized Backup
All network files can be backed-up from any location, without any network downtime.

Automatic Reconfiguration
You can remove Macs from the network, or add new ones - all without reconfiguring. DataClub is available 100% of the time.

Maximum Security & Standards
DataClub is fully AFP compliant and meets all AppleTalk standards.

Centralized Access
All information appears under one icon on the desktop, so you won't waste time searching disks or servers.

Virtual Server
Utilizing the combined resources of the network, DataClub provides centralized server access and practically unlimited storage.

Access from IBM PCs
Use AppleShare® PC, and you can access DataClub from any MS-DOS® machine.

DataClub is a trademark of International Business Software, Inc. All other products and brand names are the trademarks of their respective holders.
©1990 International Business Software, Inc.
# MacUser Marketplace

<table>
<thead>
<tr>
<th>HARDWARE</th>
<th>329-337</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR CODE</td>
<td>329</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>329</td>
</tr>
<tr>
<td>COMPUTER SYSTEMS</td>
<td>329-331</td>
</tr>
<tr>
<td>DATA ACQUISITION</td>
<td>331</td>
</tr>
<tr>
<td>DATA RECOVERY SERVICES</td>
<td>331</td>
</tr>
<tr>
<td>DISK DRIVES</td>
<td>331-332</td>
</tr>
<tr>
<td>DISKETTES</td>
<td>332</td>
</tr>
<tr>
<td>GENERAL</td>
<td>332-334</td>
</tr>
<tr>
<td>INSURANCE</td>
<td>334</td>
</tr>
<tr>
<td>MEMORY UPGRADES</td>
<td>334-336</td>
</tr>
<tr>
<td>PERIPHERALS</td>
<td>336-337</td>
</tr>
<tr>
<td>PRINTERS</td>
<td>337</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOFTWARE</th>
<th>337-343</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCOUNTING</td>
<td>337</td>
</tr>
<tr>
<td>BAR CODE</td>
<td>337</td>
</tr>
<tr>
<td>BUSINESS</td>
<td>337</td>
</tr>
<tr>
<td>BUSINESS TIME MANAGEMENT</td>
<td>337</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>338</td>
</tr>
<tr>
<td>COLOR IMAGING</td>
<td>339</td>
</tr>
<tr>
<td>DESKTOP PUBLISHING</td>
<td>339</td>
</tr>
<tr>
<td>EDUCATIONAL</td>
<td>339</td>
</tr>
<tr>
<td>ENGINEERING</td>
<td>339</td>
</tr>
<tr>
<td>ENTERTAINMENT/GAMES</td>
<td>339-340</td>
</tr>
<tr>
<td>FONTS</td>
<td>340</td>
</tr>
<tr>
<td>GENEALOGY</td>
<td>340</td>
</tr>
<tr>
<td>GRAPHICS</td>
<td>340-341</td>
</tr>
<tr>
<td>LANGUAGE TOOLS</td>
<td>341</td>
</tr>
<tr>
<td>LOTTERY/GAMBLING</td>
<td>341</td>
</tr>
<tr>
<td>MEDICAL/DENTAL</td>
<td>341</td>
</tr>
<tr>
<td>MUSIC/MIDI</td>
<td>341</td>
</tr>
<tr>
<td>PRINT DRIVERS/SPoolERS</td>
<td>341</td>
</tr>
<tr>
<td>PUBLIC DOMAIN</td>
<td>341</td>
</tr>
<tr>
<td>RELIGION</td>
<td>342</td>
</tr>
<tr>
<td>SCIENTIFIC</td>
<td>342</td>
</tr>
<tr>
<td>SHAREWARE</td>
<td>342</td>
</tr>
<tr>
<td>STACKWARE</td>
<td>342-343</td>
</tr>
<tr>
<td>TAXES</td>
<td>343</td>
</tr>
<tr>
<td>UTILITIES</td>
<td>343</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MISCELLANEOUS</th>
<th>343-345</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESSORIES</td>
<td>343</td>
</tr>
<tr>
<td>BOOKS/CATALOGUES/PUBLICATIONS</td>
<td>343</td>
</tr>
<tr>
<td>DATA CONVERSION SERVICES</td>
<td>344</td>
</tr>
<tr>
<td>DESKTOP PUBLISHING SERVICES</td>
<td>344-345</td>
</tr>
<tr>
<td>INSURANCE</td>
<td>345</td>
</tr>
<tr>
<td>NOVELTIES</td>
<td>345</td>
</tr>
<tr>
<td>SERVICES</td>
<td>345</td>
</tr>
<tr>
<td>SUPPLIES</td>
<td>345</td>
</tr>
</tbody>
</table>

## ADVERTISING RATES AND INFORMATION

MacUser Marketplace is a special economical section for product and service listings. Advertisements are grouped by category and sold by column inches. Second color option available. Standard Directory Listings are also available for a minimum of 3 issues at $415.00 per issue ($1,245.00 total).

For additional information call 212-503-5115.

## CLASSIFIED ADVERTISING STAFF

One Park Avenue, New York, NY 10016
(212) 503-5115 or (800) 825-4ADS

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director, Classified Sales</td>
<td>Paul Stafford</td>
</tr>
<tr>
<td>Sales Manager</td>
<td>Ron Kost</td>
</tr>
<tr>
<td>Group Advertising Director</td>
<td>Kathryn J. Cumberlander</td>
</tr>
<tr>
<td>Advertising Coordinator</td>
<td>Wanda D. Brown</td>
</tr>
<tr>
<td>Production Director</td>
<td>Anne R. Brockington</td>
</tr>
<tr>
<td>Advertising Support Manager</td>
<td>Monica Dixon</td>
</tr>
<tr>
<td>Production Manager</td>
<td>Carolyn Bingham</td>
</tr>
<tr>
<td>Production Supervisor</td>
<td>Bessi Dion</td>
</tr>
</tbody>
</table>

## ACCOUNT MANAGERS

DENNIS M. LEAVEY (212) 503-5111
AK, AL, AR, CO, CT, GA, IA, IL, IN, KS, KY, LA, MN, MS, ND, NM, OH, OK, OR, SD, TN, VA, WV CA (ZIPS 93000 & UP)

C. WESLEY WALTON (212) 503-5136
AZ, FL, MA, MI, MO, NJ, NC, NV, NY, TX, VT, WA

KAREN A. CASTORINO (212) 503-5140
DC, DE, HI, ID, MD, ME, MT, NH, NE, RI, PA, SC, UT, WI, WV, CA (ZIPS 92999 & DOWN), CANADA, ALL OVERSEAS.
MACINTOSH COMPUTERS & SOFTWARE

Macintosh Plus .................. $599
Macintosh SE (20/1) ........... $1399
Macintosh SE/30 (80/4) ..... $2099
Macintosh II (40/1) ........... $2299
Macintosh IIGS (80/4) ....... $1399
Macintosh Iic (80/4) .......... $4399
QMS Laserprinter 410 ......... $1999
QMS Color Laserprinter ...... $6999
Abalon Fax Modem .......... $3999

Join the Elite!
Buy the best in new and slightly used Macintosh equipment.

Call for prices on other Macintosh peripherals:
Abalon          Radius       RasterOps       QMS

MacUser Marketplace is a special economical section for product and service listings.
MAC SYSTEMS

MAC Classic 1MB $1995
MAC Classic 2MB, 40MB 1995
MAC Classic 4MB, 40MB 1595
MAC SE/30 5MB, 80MB 3595
MAC LC All Models CALL

SCANERS

Image Writer II $449
Abaton Scanner 1295
H.P. ScanJet Plus & Intif 1499
G.C.C. PRINTERS
P.I.P II 1350
P.LF IIIS 1790
G.C.C. POST SCRIPT
B.LP II 4 Ppm 2350
B.LP II 8 Ppm 2850
N.EC 90 6 Ppm 1750
Write Impact 24pin 675
Write Move 3 Lb. 715
QMS 410 / 47 Fonta, 2MB 2195
Dicoxin 150 475
H.P. Paint Writer XL 2299
H. P. Desk Writer 729

APPLE

12" Mono CALL
12" Color 475
15" Color H.- Res. 720

RADIUS

Pivot & Card $1195
19" Mono & Card 1349
21" Mono & Card 1655
19" Color & Card 3955
E-MACHINE
Full Page Color & Card 1885
2 Page 17" & Card 1250
2 Page 21" & Card 1850
2 Page 16" Color 3250
2 Page 19" Color 4150

MAGNAVOX
Gold Star 419
Mac Sync 499

RASTER OPS
Raster Op 208 Card 395
Raster Op 264 Card 535
Raster Op 364 Card 1395

INTERNATIONAL COMPUTER CENTER
16175 Roscoe Boulevard Sepulveda, California 91343
Tel: (818) 894-1100 Toll Free: (800) 757-7706 Fax: (818) 891-3285
All Merchandise New & One Year Warranty - No Tax on out of CA. Most Items in stock.
We will beat any advertised price on Mac's in this Magazine. Visa, MC, American Express accepted.

INTERNATIONAL ORDERS WELCOME.

Nobody Does Mac Systems Like Mac•In•Stock®.

Nobody Has More Macs.
Starter systems, or vertical & high-end technology. New Mac models? Call us for product information.

Nobody Has More Peripherals.
Abaton, GCC, Radius, RasterOps, SuperMac Quantum, Rodime, Microtek, and more.

Nobody Adds More Value.

Mac Expertise • Toll-Free Tech Support • Free Warranty Repair • Rock-Bottom Prices.

Nobody Gives You More Warm Fuzzies!
Ask for references. Our customers (from Phoenix to Fiji) will tell you how we maximize your Macintosh budget.

Nobody Does It For Less.
Shop around. We consistently beat up the big guys...and out-perform the rest.

Call Toll-Free: 800-633-1538
Fax Your Request For A Quote: 213-322-1486
International Customers: 213-322-1455

MACINTOSH•IBMPS/2•Laser printers
And a host of other peripherals!

Used Mac Equipment!

Access II
26 Keewaydin Drive
Salem, NH 03079
800-666-5612

Don’t buy or sell any new or used equipment until you talk to us. We deal exclusively in Macintosh equipment. Call today for the best deals anywhere!

CIRCLE 208 ON READER SERVICE CARD

RENTSALS

$189 per mo.

Mac SE
Next Day Delivery
Anywhere in the U.S.A.

PC Computer Rental

Call Toll-Free
800-765-4727

CIRCLE 210 ON READER SERVICE CARD

CIRCLE 209 ON READER SERVICE CARD

CIRCLE 211 ON READER SERVICE CARD

CIRCLE 212 ON READER SERVICE CARD

330 January 1991 MacUser
Peripheral Vision
(800) 800-7868
Look!!!
Syquest 45 mb Removable
Memory Upgrades
Starting at $42.00
Other drives & capacities available
2333 Fairmount Ave. Philadelphia,
Pa. 19130 U.S.A. (215) 232-9800

Macintosh 680 MB $1848
5 Year Warranty 200,000 hrs MTBF*

Fujitsu 3.5" Drives
44MB 3.5" $299 $371
80MB 3.5" $464 $534
160MB 3.5" $556 $624
320MB 3.5" $744 $824
1 Year Warranty 100,000 Hours MTBF*

Fujitsu 5.25" Drives
357MB 5.25"FHD $5199 $4199
357MB 5.25"FHD $656 $234
357MB 5.25"FHD $769 $824
1 Year Warranty 100,000 Hours MTBF*

MacDirect! 800-621-8461
60 East Chestnut -145, Chicago, IL, 60611
Visa, MC, COD, Gov. Corp. P.O. Accepted
New, Drives, Factory Warranty / Bracket, cables and software included:
30 Day MBG/Hours: 8:30-6:30 CST

HARD DRIVES
40MB
External
40MB 28mssec Conner
Includes Software & Cable
$399
Computer Products Corporation
4657 MacArthur Lane
Boulder, CO 80301
(800) 338-4273

DISKETTES
FORMATTED DISKETTES
BASF, VERBATIM, SONY

WITH
QTY 250
FORMAT MIX & MATCH
FORMAT
$4.44
5.25" DSD/0 $5.99
5.25" DSD/1 $5.99
$6.10
5.25" DSHD/0 $5.99
5.25" DSHD/1 $5.99
$1.39
5.25" DSHD/2 $1.25

FREE FORMATTING
ON FIRST ORDER

TYVEK SLEEVES & Labels Included
COLORED MEDIA, Please Add $ 5.00
PRIVATE LABELING Available
SAME DAY Shipping
MONEY BACK GUARANTEE

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

APPLE II & MACINTOSH SYSTEMS PARTS EXCHANGE REPAIRS
WE BUY & SELL
• Power Supplies
• Logic Boards
• Disk Drives
• Genuine Apple Parts

California Telephone
800-274-5343
Int'l: 617-891-6851
FAX: 617-891-3556

PRE-OWNED ELECTRONICS INCORPORATED
30 Clematis Avenue, Waltham, MA 02154

GENERAL
Category continued on the next page.
Cheap Mac's

Macs from $295
Macs Plus from $695. Mac SE from $995. FULL 100% WARRANTY

Now you can buy Macintosh systems and peripherals for up to 50% off new prices. All come with a 3-month 100% warranty and a no-questions-asked 30-day money-back guarantee.

Reconditioned and guaranteed by Sun Remarketing, America's foremost Macintosh remarketer.

For complete catalog or to order, call anytime. Operators available 24 hrs.
1-800-821-3221
or write to: Sun Remarketing
P.O. Box 4059, Logan, UT 84321

Features:
- 5 Mb Ram
- PostScript
- ApplesTalk
- Pantone ColorMatched

ComputerInsurance PLUS
Insure in one easy step! ComputerInsurance PLUS replaces your computer after fire, theft, power surge, natural disasters, including earthquake. Call NOW to receive comprehensive coverage and fast replacement.

The ComputerInsurance Agency, Inc.
6150 Old Millersport Rd., NE
Pleasantville, OH 43148
(800) 722-0385
8 a.m. - 6 p.m.

SIMMONS MICROSYSTEMS
One of the Nation's Fastest Macintosh Upgrade/Repair Facilities is Growing!

SIMMONS CONSULTING IS NOW SIMMONS MICROSYSTEMS

Same Day Turn-Around - Nationwide 30 Minute Turn-Around - Locally

- New and Used Macintosh Systems Available
- 120 Day Warranty on New Equipment - 90 Days on Used!
- Request for Quotes Via FAX
- Nationwide Leasing Capabilities for Businesses
- Dealer Inquiries Welcome

MacUser Marketplace is a special economical section for product and service listings.
MEMORY UPGRADES

What?! Me on the Big Screen?

New Big Screen Life For Old Macs.
Add the Mac Rescue " Video to any enhanced 128K or 512K Mac and you can use any standard video monitor, get up to 6 megabytes of memory and it's 20% faster than a Mac Plus. Wow!

Makes any standard single page monochrome monitor very happy. Mac Rescue Video also has an SCSI port and it can add up to 4 megs of RAM plus a 2 meg RAM Disk. The RAM Disk may eliminate the need for a hard disk. The video circuitry was developed in collaboration with Lapis Technologies.

Trash the 128K and 512K Macs? Fiddlessticks! 'Too little memory' Not so. The Mac Rescue Video daughterboard snaps on to the enhanced Classic Mac motherboard. That's right, snaps on, no need to fold, spindle or solder. Install in minutes to get the functionality of a speeding Mac Plus.

Six SIMM slots give you 1, 2, 2.5 or 4 megs of RAM plus either a .5 meg or a 2 meg RAM Disk. Special RAM Disk software is available from Computer Care.
We design, make and market 256K, 1 meg and 4 meg SIMMS, IX Liberator, Pac RAM for the Portable, Softstep® memory expansion modules and Mac Rescue™ for Enhanced Classic Macs. All have a one year warranty. Call today.

Advanced Simms & Memory Systems Co.
15 Union St.
Lawrence, MA 01840
(508) 683-2325 in MA. Fax (508) 975-3232
CIRCLE 231 ON READER SERVICE CARD

RAM MAN
1 MB 80 ns SIMMs
$59
We'll Match ANY Price! COD/Credit Card/PO CALL US LAST!
503 631-3698
SPECIAL BUYS
105 MB external ouctionum... $779
Seiko Hext 42 Remanuabie... $879
Tope Cartridges for Relax... $99
CIRCLE 234 ON READER SERVICE CARD

ACCU-SIMMS
We manufacture our own Simms and guarantee them for life. Add dependable memory from someone who can back them up. Call for latest price. As prices change so fast, as low as $49.00 per meg. We've been in the semiconductor business for over 26 years. Call Toll Free: 1-800-662-SIMM(7466)
Data Memory Systems Co.
3001 Ford Centre, Suite 1180
440 North Fitth St.
Minneopolis, MN 55401
(612) 371-0061
(900) 950-CARE (2273)
(900) 371-9342 Fax
CIRCLE 232 ON READER SERVICE CARD

We'll Match ANY Price! COD/Credit Card/PO CALL US LAST!
503 631-3698
SPECIAL BUYS
105 MB external ouctionum... $779
Seiko Hext 42 Remanuabie... $879
Tope Cartridges for Relax... $99
CIRCLE 234 ON READER SERVICE CARD

1 Mb & 4 Mb SIMMs for Mac II
(800) 289-8801
(213) 208-3206 (213) 208-3282 FAX
CIRCLE 232 ON READER SERVICE CARD
MEMORY UPGRADES

1 MEG SIMMS

• 80/70ns
• Low profile
• Surface mnt
• All new parts
• Lifetime Guarantee

LOWEST PRICE!!!

CIRCLE 235 ON READER SERVICE CARD

UPGRADES!

(User-Installable!)

512Ke-Plus $295
512K-Plus $625
128K-Plus $695

Accelerators
by Dove, Daystar, & Newbridge

Motherboards
Many types!

800-332-6581

PERIPHERAL OUTLET
314 S. Bdwy • Ada, OK 74820
405-332-6581 • Fax 405-436-2245

Prices subject to change Visa & MC okay (add 3%)
CD-ROM Extravaganza!
1-800-843-9497

CD-ROM Drives
Microsoft Office is only $99 w/ the purchase of any CD-ROM drive. Limited time offer. Save $50 on EDUCORP CD-ROM 4.0 w/ any drive purchase. One-year warranty on all drives. Driver software and two copies included. Specify (9902) SCSI to SCSI or (9901) MAC to SCSI cable. PC interface available. Please call.

Exotica-ROM 2.0™
New & improved! Over 140 exotic paintings in brilliant color & black & white, and grayscale. Updates available. Please call. Available on 3-1/2 disk packs. #11-1327, $399 MAC & PC

Lingua-ROM™
Speak Russian, French, Spanish, German, Japanese, Italian, and Chinese. 25 of HyperGlo's languages. #1358, $499.00

Desktop Publishing CD™
Contains over 190 laser pages, over 190 EPS clip arts, 12 programs related to desktop publishing, 22 demos, TDF Draw utilities, world stamps in grayscale and color TIFF, and more. #1389, $79.95 intro offer

3-CD Pack For Only $99!
Newly released for the Macintosh—Birds of America (6/2 sound), Shakespeare, and Sherlock Holmes on Disk! Regularly $289. Limited time offer. #1544, $99.00

CD-ROM Titles
134 The Magic Flute ... $99.95
1347 Beethoven's Symphony No. 9 ... $79.95
1365 Beethoven String Quartet #14 ... $99.95
1358 The Voyager CD Audio Stack ... $79.95
1301 USA Fact Book ... $99.95
1331 The World Fact Book ... $79.95
USA Fact Book & World Fact Book for $129.95
1370 All of Mac Tutor ... $189.95

EDUCORP Stocks The Largest Selection Of CD-ROM Titles—Over 90 In Stock!
Well meet or beat any advertised price 1-800-843-9497

CIRCLE 246 ON READER SERVICE CARD

MacUser Marketplace
Stand out in a crowd! Take advantage of MacUser's new second and third color options.
Call 1-800-825-4237

MacUser Marketplace gives you the versatility you need to get your product the most attention. Our options include:

- Second and third color options
- A choice of display format or directory listings
- Frequent and advance payment discounts that let you get the most from ad dollars.

CIRCLE 247 ON READER SERVICE CARD
COLOR IMAGING

24-Carat Quality On An 8-Bit Display

View 24-bit color images on an 8-bit display with PrisMat™ PaletteMaker™! It reduces colors in your 24- or 16-bit images to the best 256 colors—never with stark contouring. Use these images in paint, animation and presentation systems.

- Convert images to TIFF, PICT, GIF and PCX
- Create custom palettes (size, reserved colors)
- Adjust red, green, blue, brightness and contrast
- Change TGA (TPIC) image size/aspect ratio
- Runs on all Macs: PC version also available

MacUser Marketplace
To place your ad call (212) 503-5115 or (800) 825-4ADS

DESKTOP PUBLISHING

Basics of Desktop Publishing

VISA/MC accepted.
Pageworks, Dept. MB
Box 1445
Chicago, IL 60614
(312) 348-1200

EDUCATIONAL

GRADE MACHINE™

Gives you FAST full-screen editing of grades, weighted assignments & categories, and style sheets to customized reports. Each class file holds 150 students & 200 assignments, and can be divided into 5 grading periods. Money-back guarantee: NOT copy-protected! Only $49.95 + $3.50 S&H ($4.33 tax in WA).
Misty City Software
10921 128th Place N.E.
Kirkland, WA 98033
(206) 826-3107

EDUCATIONAL ENGINEERING

Model-It!™ Visual Programming Tool for Dynamic Systems Modeling & Simulation

- Get results directly from block diagrams without computer language programming!
- Simulate dynamic systems, solve differential equations, test algorithms, filter data sets, test and optimize designs, perform general numeric processing
- Modify data and diagrams while a simulation runs
- Works tables and plots update automatically
- Cut and paste diagrams, tables, and plots
- Import and export data files
Norris Software Systems, Inc.
201 Western Avenue #432
Knoxville, TN 37921

Civil, Structural, Surveying, Deed Plotting

FRAME mac® Structural Analysis

- Foundation design
- Beam design
- Column design
- Truss analysis
- Stairs design
- Concrete slabs
- Steel sections
- Foundation design
- Complete structural analysis
- Finite element analysis
- Print reports

PRICE $799 (St. MA/CA, $899), U.S. Shipping $29, Foreign $49

MacUser Marketplace
To place your ad call (212) 503-5115 or (800) 825-4ADS

ENTERTAINMENT/GAMES

Go - meet your NEMESIS™

Go has been a way of life in the Orient for over 2,000 years. As much a philosophy as it is a game, Go is considered by many to be the secret of Japanese success, "the leading Go game for the Macintosh". Using a new, improved learning engine with the best of old, the game has been re-designed as an ordinary automatic solo to go instruction developed! MacWorld 1/91
P.O. Box 6, Dept. D, Knoxville, TN 37748-1626, (865) 254-1166

Color Imaging

24-Carat Quality On An 8-Bit Display

View 24-bit color images on an 8-bit display with PrisMat™ PaletteMaker™! It reduces colors in your 24- or 16-bit images to the best 256 colors—never with stark contouring. Use these images in paint, animation and presentation systems.

- Convert images to TIFF, PICT, GIF and PCX
- Create custom palettes (size, reserved colors)
- Adjust red, green, blue, brightness and contrast
- Change TGA (TPIC) image size/aspect ratio
- Runs on all Macs: PC version also available

MacUser Marketplace
To place your ad call (212) 503-5115 or (800) 825-4ADS

DESKTOP PUBLISHING

Basics of Desktop Publishing

VISA/MC accepted.
Pageworks, Dept. MB
Box 1445
Chicago, IL 60614
(312) 348-1200

EDUCATIONAL

GRADE MACHINE™

Gives you FAST full-screen editing of grades, weighted assignments & categories, and style sheets to customized reports. Each class file holds 150 students & 200 assignments, and can be divided into 5 grading periods. Money-back guarantee: NOT copy-protected! Only $49.95 + $3.50 S&H ($4.33 tax in WA).
Misty City Software
10921 128th Place N.E.
Kirkland, WA 98033
(206) 826-3107

EDUCATIONAL ENGINEERING

Model-It!™ Visual Programming Tool for Dynamic Systems Modeling & Simulation

- Get results directly from block diagrams without computer language programming!
- Simulate dynamic systems, solve differential equations, test algorithms, filter data sets, test and optimize designs, perform general numeric processing
- Modify data and diagrams while a simulation runs
- Works tables and plots update automatically
- Cut and paste diagrams, tables, and plots
- Import and export data files
Norris Software Systems, Inc.
201 Western Avenue #432
Knoxville, TN 37921

Civil, Structural, Surveying, Deed Plotting

FRAME mac® Structural Analysis

- Foundation design
- Beam design
- Column design
- Truss analysis
- Stairs design
- Concrete slabs
- Steel sections
- Foundation design
- Complete structural analysis
- Finite element analysis
- Print reports

PRICE $799 (St. MA/CA, $899), U.S. Shipping $29, Foreign $49

MacUser Marketplace
To place your ad call (212) 503-5115 or (800) 825-4ADS

ENTERTAINMENT/GAMES

Go - meet your NEMESIS™

Go has been a way of life in the Orient for over 2,000 years. As much a philosophy as it is a game, Go is considered by many to be the secret of Japanese success, "the leading Go game for the Macintosh". Using a new, improved learning engine with the best of old, the game has been re-designed as an ordinary automatic solo to go instruction developed! MacWorld 1/91
P.O. Box 6, Dept. D, Knoxville, TN 37748-1626, (865) 254-1166

Go - meet your NEMESIS™

Go has been a way of life in the Orient for over 2,000 years. As much a philosophy as it is a game, Go is considered by many to be the secret of Japanese success, "the leading Go game for the Macintosh". Using a new, improved learning engine with the best of old, the game has been re-designed as an ordinary automatic solo to go instruction developed! MacWorld 1/91
P.O. Box 6, Dept. D, Knoxville, TN 37748-1626, (865) 254-1166

$79/NEMESIS Mac Master $49 Alumni Games $29 Junior Student $6.29 sale

MacUser January 1991 339
“Excellent Animation”, “One of the best card games that I have seen on any computer system”, “A wonderful new game”, “It’s just amazing this is programmed in Hypercard” — Neil Shapiro, Mac Hands On

“I love this game” — Brian Renard, Apple Computer, Inc.

“10 well executed gambling games” — Hyperlink Magazine

“Wonderful digitized sounds” — Computer Currents

ALL NEW... GAMBLIN’ TIMES 3.0

The best gambling simulation available. Over 100 million different combinations. Craps, Blackjack, Keno, 7 Card Stud, 5 Card Draw, 3 Card Stud, Split in the Ocean, Texas Hold’em, Five different Slots, Speed 4x4, Liar Poker, Roulette. Multiple gamblers by rank, financial statements, adjustable sound music, statistical information, unlimited betting, real voice, user defined wildcards, betting systems, adjustable speeds, house percent and a lot more. Very cool NPC’s. Requires Hypercard 1.2, hard disk, 1 MB RAM.

Check or M0 for $87.95 + S&H. Wilson Marketing, 1239 E. Palm, Altadena, CA 91001

(818) 791-3656 MC/VISA

CIRCLE 255 ON READER SERVICE CARD

365 Day Desktop Calendar

Calendar for the Macintosh™

Screen-A-Day Software
1-800-234-0380 ext. 814

Screen-A-Day Calendar

Select one:

- Sports Theme
- L.M. Boyd’s "Birds Day"
- Art Theme
- 1st Calendar

Introductory Price

$19.95

plus S & H

FONTAGENIX™

W/10 of bitmap display type fonts

ARTAGENIX™

W/10 of graphic display type fonts

LASER.GENIX™

W/10 of digitized LASER type fonts

Foreign Font Edition™

27 foreign language bitmap type fonts

Devonian International Software Company
P.O. Box 2365 • Montclair, CA 91765
714-621-0173

Phone: (515) 472-6461

CIRCLE 257 ON READER SERVICE CARD

MacUser Marketplace

To place your ad
Call (800) 825-4ADS or (212) 503-5115

today to reach 315,000
Macintosh Business Buyers
**GRAPHICS**

**MAPART**
Presentation Quality Clip Art Maps
- World, Continents, USA
- 20+ Countries by State/Province
- EPS, Draw, PICT, Paint
- Edit maps with: Illustrator, FreeHand, MacDraw, Canvas, MacPaint
- For your FREE brochure with sample maps call:
  800-334-4291

**Call for a FREE Guide to Public Domain & Shareware**
- 1-800-2424-PSL
- Public (software) Library
  P.O. Box 35705-YH
 Houston, TX 77235-5705
  1-713-524-6394

**LANGUAGE TOOLS**

**NEW!!**
- 68000, COPBOO, PIC16Cxx versions!
- µASM™ Cross Assemblers for the Macintosh™
  - TEXT EDITOR, CROSS MICRO ASSEMBLER, AND
    COMMUNICATIONS FACILITY INTEGRATED DEVELOPMENT
  - ENVIRONMENT TO MOST EIGHT PROGRAMMERS
  - AVAILABLE FOR MOST 8-BIT MICROPROCESSORS
  - 30 DAY MONEY BACK GUARANTEE. MICRO."'

**LOTTERY/GAMBLING**

**MacUser Marketplace**
- To place your ad call:
  (212) 503-5115
- or
  (800) 825-4ADS

**PRINT DRIVERS/ SPOOLERS**

**MacJet**
- From the company that invented the QuickDraw Laser Printer
- Use any HP (or compatible) laser printer with the Macintosh!
- Can print Type 1 Fonts into any HP SoftFont Fonts
  faster than Apple's LaserWriter
- Use COLOR as Grayscale
- $99.95
- COMPUTERApplications, Inc.
  (919) 846-1411

**MUSCI/MIDI**

**MacBEAT**
- Offers the most knowledgeable sales & tech support for
  Music on the Mac. Authorized Coda, Dr. T's, Digidesign,
  Mark of the Unicorn, Opcode, Passport, Roland CMS & more.
- From MIDI cables to complete computer systems:

  **1-800-MAC-BEAT**

**PUBLIC DOMAIN**

---

**MacUser Marketplace**
- Listings are grouped by category and sold by column inches.

**MacUser January 1991**
Study English, Greek, and Hebrew at the same time!

Introducing macBible: The comprehensive Bible research software for the Apple Macintosh.

Speed, accuracy, flexibility, thoroughness — make macBible a revolutionary tool for Bible study. Only macBible offers all these as individual modules, or in any combination:

- New International Version
- Revised Standard Version
- King James Version
- Greek New Testament (UBS3, corrected)
- Hebrew Bible (BHS)

Plus these features:

- Three search options — word and phrase, verse, word count
- Six windows — five text, one special-purpose, simultaneously
- Print or export any text to word processor

Apple and Macintosh are registered trademarks of Apple Computer, Inc.

Zondervan Electronic Publishing
1415 Lake Dr.
S.E., Dept. MU
Grand Rapids, MI 49506

10th Anniversary Celebration!

Ten years at the top! Version 4.3 VERSE SEARCH now offers a Thesaurus for searching on concepts and instant access to every word or verse. Our family of Bible study products includes: NIV, RSV, KJV or NKJV text, Bible Dictionary, Thesaurus, Chain References, Personal Commentary, Greek / Hebrew translators, Topical Bible and Chronological Bible. Desk accessory VERSE TYPIST transfers verses directly to your word processor. Our $5 Demo disk shows why we have sold more products than any other Bible program!

Bible Research Systems • 800-423-1228

2013 Wells Branch Parkway #304 • Austin, Texas 78728
Tech Support (512) 225-1541 Call for a free Catalog... Satisfaction Guaranteed.

STACKWARE

Expand your vocabulary in: CZECH FRENCH SPANISH GERMAN RUSSIAN LATIN

Over 2000 words / 1000 foreign synonyms. Complete, accurate translations and thousands of English synonyms! MacFlash Cards get you to the intermediate vocabulary level FAST. Compare our prices and SAVE! German I/II, French I/II, Spanish I/II, Russian I/II, Czech I, Latvian I: $25 each. S&H $3. CA Res add 7.25% tax. Call or send for additional information. Order today by calling 1-800-283-4080 X850

The Language Quest Software Company Inc.,
101 First Street, Suite 428. Los Altos, CA 94022
Next Day Shipping
CIRCLE 274 ON READER SERVICE CARD

MacUser Marketplace

is a special economical section for product and service listings.
Stackware

HyperSpell XGMD
HyperSpell is the complete HyperCard spelling check! It is similar to "spell" dialogs in word processing programs. HyperSpell contains a "find/change" dialog and a highly compressed 16K dictionary which contains over 100,000 words. Credit cards accepted and dealer inquiries welcome. $49.95.

Foundation Publishing, Inc.
14228 Shore Lane
Prior Lake, MN 55372
(612) 443-8880

Dialoger Professional tm 1.5
Dialoger Professional is a complete environment for the design, creation and control of any kind of dialog window—entirely within HyperCard! Using floating panes, picture buttons, popups and custom controls, you can break through HyperCard's limits. $125.00.

theResult Software Inc.
111 Providence Rd.
Chapel Hill, NC 27514
(800) 365-5034 or (919) 490-3292

Accounting/Time Management
Introducing the first NEW Professional Professional, a fully integrated, double entry bookkeeping system, includes HyperCard 2.0. Easy to use, a key to fiscal responsibility. Price $349. Demos 50% + S&H. Also available the original Professional V 2.0. Price $99 + S&H. To order or for more info call or write:

Wezel & Co., Inc.
147 East Rocks Road
Norton, MA 02766
(617) 635-7849

Taxes

Business Tax Templates
1095, 1120, 1120S, IRS approved.
Easy entry with receipt book. K-F1s!
Over 50 #'d supporting stmts!
Easy-enlry wksht. for unlined K-1's
In and more for info call:

FWB, Inc.
1(800) 635-7849

miscellaneous/accessories

Mac Freighters
The Best Deluxe Shipping Cases
"Super Strong" made of steel, aluminum & ABS. The Ultimate airline check in or shipping containers

Wholesale Prices
In stock—same day shipping
Custom cases made to order
Accept VISA, Mastercard. Company PO's

Linebacker Inc. For more information call: 1-800-228-7042

Circle 280 on Reader Service Card

Nuvu

Magnify Your Monitor Screen Up to 3X!
- Distortion-free lens by 3M
- Designs to fit all monitors
- Available with Polaris anti-glare filter

The Single Solution to the Problems of Radiation Danger and Vision Impairment!
For a dealer near you or for more info call:

800-872-1051

Less Gaus Inc.
Box 5006 Rhinebeck, N.Y. 12572

Circle 279 on Reader Service Card

Utilities

Hard Disk Util v3.0
Hard Disk Util uploads copy-protected software onto hard disks and floppy disks. It eliminates the need to insert a "key" disk. Program incompatibility with newer computers and Systems is quickly eliminated. Available since 1985, it supports most of the popular CAD, entertainment, and music software. $149.95

Protector Software, Inc.
1420 Polk Street, Suite 215
San Francisco, CA 94109
(415) 474-8055, (415) 775-2125 FAX

Books/Catalogues/Publications

A 50-Year Tradition

Star Enterprises

Protect your MAC!
Specially cases available. Choose from the vintage "MAC 128" to the newly introduced "Classic", LC & II line. Slatecams and custom cases available for your computer and peripheral case needs. For the finest in reusable shipping & carrying cases, call the

Star Order Hotline: (600) 782-2273

Circle 281 on Reader Service Card

Are Computers Conscious?
In JONAH: THE ANATOMY OF THE SOUL, Dr. Stephen Goldberg, bestselling author on the nervous system, fuses neurology, computer science, and quantum theory in the strongest case to date for consciousness in computers. 166 pgs., $19.95 + S&H

MedMaster, Inc.
PO Box 640028, Dept. MU
Miami, FL 33164
(305) 653-3480

MacUser Marketplace

Standard directory listings available for a minimum of 3 issues at $415.00 per issue
($1,245.00 total).

MacUser January 1991 343
DATA CONVERSION SERVICES

WE CAN CONVERT DATAFILES TO/FROM OVER 1,500+ SYSTEMS IN VIRTUALLY ANY FORMAT! ON DISKS OR TAPES!
Systems like:
- Mainframes
- Mina
- Microcomputers
- Typesetters

Formats like:
- Knopfler
- Microsoft Word/Works" "Jazz"
- WordPerfect
- ED
- File manager
- 4th Dimension
- Typesetters of the previous century.

WE CAN CONVERT DATAFILES TO/FROM OVER 1,500+ SYSTEMS IN VIRTUALLY ANY FORMAT! ON DISKS OR TAPES!

DIGITAL PHOTO

WE CAN CONVERT DATAFILES TO/FROM OVER 1,500+ SYSTEMS IN VIRTUALLY ANY FORMAT! ON DISKS OR TAPES!

DESKTOP PUBLISHING SERVICES

SLIDE IMAGING

All major Mac/PC packages!

POSTSCRIPT SLIDES!

Canon Color Laser Copy Now Available!

Overheads, Prints, Dupes, 3x5 Transparencies, Scanning, Imagesetting

- Adobe fonts
- free technical support
- 24/75 hour service
- 4k & 8k resolutions

$7.00 from

Sliders from Your MAC

We want your business. And we'll prove it!
We offer the best service available. Experts in
Persuasion, Powerpoint and others, on staff
to serve you. Free Federal Express shipping,
Toll-free Customer Service. And if you
should make a mistake, we'll reshoot your
slides, free. Call today, and say "I'd like
to try your service. Free."

1-800-222-2592

Accent Presentations, Inc.

3355 Wilshire Blvd., Ste. 407
Los Angeles, CA 90010
800/996-8228 Voice Phone
800/386-9998 Mac Modem

DESKTOP PUBLISHING SERVICES

DIGITAL PHOTO

* WILL IMAGE ANY PICT, PICT2, 32 BIT PICT, 24 BIT TIFF
* QUALITY SERVICE & TECH. SUPPORT
POSTSCRIPT SLIDES, TOO!

Transmit & Shipping within 24 hrs., 7 days a week
FOR MORE INFORMATION:
400 Line Resolutions
Transmit 24 Hours/Day, 7 Days/Week
400 Line Resolution

$5

from

$350

Call for your free sign-up kit and get a coupon for 5 Free Slides

Roll Stengel
Visual Productions
120 West 44th Street
New York, NY 10036

DESKTOP PUBLISHING SERVICES

Category continued on the next page.

344 January 1991 MacUser
Columbus, Ohio
SAFEWARE, The Insurance Agency, Inc.
2929 N. High Street, P.O. Box 4221
Columbus, Ohio 43202
(614) 262-0708, FAX 614-262-1714

MARKETPLACE

DESKTOP PUBLISHING SERVICES

COLOUR POSTERS
• PC Mac Unix etc.
• Postscript formats
• Most vector & raster
• 42 in. X 12 ft., 400 dpi
• 24 hr.12.2k Baud EBS

• Large illustrations
• Large renderings
• Courtroom displays
• Signage, Murals

Architectural
digital prism inc.
636 El Camino Real
San Carlos, CA 94070
(415) 508-8800

CIRCLE 292 ON READER SERVICE CARD

INSURANCE

What happens after the warranty runs out?
Simple. You're the one that pays for repairs. Unless you have extra cash ... and more). A single insurance policy covers all your equipment for as little as $100. Call for Free Brochure:

• 24hr 19.2k Baud BBS • Postscript formats • Architectural
• Architectural 415 508-8800
• Large renderings • PC Mac Unix etc.
• Large illustrations • Large renderings
• Courtroom displays • Signage, Murals

Our

MAC SHOP • (800) MAC-SHOP
Mac Shop • 2200 NW Bardinon • Birmingham, AL 35205 • (503) 677-0851 • (800) 622-7587

CIRCLE 295 ON READER SERVICE CARD

SERVICES

Mac Repair

• Apple™ Certified Technicians
• One-Day Service Turnaround*
• Mac Plus Upgrades from 128/512
• Up to 75% below Dealer Rates

*on most repairs. Visa/MU/AX. Fast overnight air express available. We use genuine Apple™ parts

MAC SHOP • (800) MAC-SHOP
Mac Shop • 2200 NW Bardinon • Birmingham, AL 35205 • (503) 677-0851 • (800) 622-7587

CIRCLE 295 ON READER SERVICE CARD

SUPPLIES

Never buy another ribbon!
Over 150,000 sold!

MacInker™, the Automatic Ribbon Re-inker, re-inks any printer ribbon (black & color) for 5 c.
Lubricating ink flows prethreaded, extends its life and yields better-than-new printout. Average re-inkings per cartridge: 60-100. Universal MacInker (spec printer) $75. ImageWriter II/II $45. Adapters available for multicolor cartridge, $40. Complete range of black, color, heat transfer, special ink cartridges. Satisfaction or 30 day refund. Free key-beeper-flashlight for orders >$100.00. Order toll free or call to get full information.

(800) 547-3303

CIRCLE 296 ON READER SERVICE CARD

SERVICES

MacUser Marketplace
To place your ad call
(212) 503-5115 or (800) 825-4ADS

CIRCLE 297 ON READER SERVICE CARD

NOVELTIES

THE Most Exciting New Fun item for the MAC
Not Software but a 24 page fun booklet

Get some laughs...
Share it with a friend...
Give it as a gift...
You'll love it!
$5.95

55¢/ea. BLACK
$1.00/ea. COLOR

H11(I S1Jd' •

Harry Dol Solutions
1-800-822-2345

CIRCLE 298 ON READER SERVICE CARD

QUANTITY DISCOUNTS AVAILABLE

CIRCLE 299 ON READER SERVICE CARD

SUPPLIES

RE-INKING and Color-Conversion Services for
HP DeskWriter Print Cartridges
$8.50 ea. BLACK $18.00 ea. COLOR

Blue, Brown, Green, Red, Turquoise & more!
New DeskWriter Cartridge . . . , $19.00
Tat. James/SN Included (U.S. & Canada)

BrightDot Solutions
P.O. Box 967
Lakeside, CA 92840
Call: (619) 561-9415

VISA, MasterCard Accepted

CIRCLE 290 ON READER SERVICE CARD

CIRCLE 291 ON READER SERVICE CARD

Color-Conversion Services ribbon!

MAC SHOP • (800) MAC-SHOP
Mac Shop • 2200 NW Bardinon • Birmingham, AL 35205 • (503) 677-0851 • (800) 622-7587

CIRCLE 295 ON READER SERVICE CARD

MacUser January 1991 345
The Gloom and Doom Boom

Apple is doomed. It was doomed when it was a $100 million company. It was doomed when it was a $1 billion company. No doubt it will be doomed when it's a $10 billion company.

As the new year begins, Apple is under attack for losing some of its market share to the PC-clone mania last year. The situation at Apple was worsened by the release of Windows 3.0—a program that mimics the Mac interface. As sales and profits increase, everyone is predicting the worst for Apple. They always have: They always will.

Observers always predict the worst for IBM too. They say that mainframes are dead and that IBM is out of touch and will fall apart any minute. DEC is doomed too. The minicomputer is a dead duck. The company will go broke any minute—just you wait.

So nobody is really picking on Apple. It seems that, for some strange reason, all computer companies are bad ideas.

I heard the gloom and doom about Apple long before its first $100-million year. "Too big. It won't be able to handle those numbers." Then Apple approached its first billion-dollar year. "It'll never survive. It's too big. It'll fall apart." I suppose when Apple cracks $10 billion, it will be even worse off than it was when it was making $100 million.

It never ends. Sure, someday IBM, Apple, and DEC will fold up their tents. They may be sold, or they may break up. But it could be the year 2015 when it happens.

So here's the mystery: Why do we keep hearing predictions of gloom and doom for companies that are profitable year after year and growing at a steady rate?

Perhaps it's because many computer companies do fail. Micromakers, minmakers, mainframe makers, super makers. They go broke more often than not. In our category, desktop computers, there were a slew of losers over the last decade: Dot, Polo, Adam, Morrow Micro Decision.

I suppose that because of failure after failure, we can generalize about success. It's impossible to succeed.

Tell it to the judge. A quick look at the success of the PC and the Mac makes it clear why IBM and Apple continue to grow despite the experts' predictions.

Part of the success is due to piracy. IBM and Apple have machines that invite easy software piracy. Companies such as DEC, which entered the low-end market with secure systems (and even sold preformatted disks), have failed miserably. Machines with oddball drives or imbedded serial numbers can never make it in this market.

It's not that people pirate software to use it. They pirate to play with software free and buy it later if they want it. Software vendors hate the idea that someone is using their $900 database manager borrowed (or copied) from a friend. They perceive this as a lost sale. I used to argue that this wasn't really a lost sale but rather a sales tool. People who pirate software usually don't buy it in the first place, so it's not a lost sale. It's just sitting on a shelf.

Recently I've altered my interpretation of this phenomenon and now conclude that some sales are actually lost. When you get to play free with some of the junk out there and decide not to buy it, then a sale may have been lost. If easy copying weren't possible, then the software would be sold to a dissatisfied customer—but it would still be a sale. A gyp rip-off sale, but a sale nonetheless. I have no sympathy for this lost-sale victim.

Anyway, the freedom to look at software without penalty is not understood by companies such as the defunct Fortune Systems, which came on the scene years ago with one of the earliest and cheapest UNIX/68000 systems. Unable to identify with the end user, it made the machine secure.

Even the slew of PC cloners almost have to try to go out of business nowadays. These companies offer nothing special in terms of R&D or support—they are selling disk-copying machines that let users recoup their hardware investment by bootlegging just a few pieces of software. It's the modern (pirate) equivalent of bundling. So the hardware makers are getting filthy rich. The few cloners that go broke are simply mismanaged.

The fact is that the market is a bonanza for anyone who wants to play. Apple is making a ton of money. IBM is making a ton of money. They're all making a ton of money.

So why all the doom and gloom? It's because failure is more fun than success. You can analyze a failure. You can say, "I knew it," or, even better, "I told you so!" You can tell people what they did wrong. You can say how you would have done it better. It's much more fun than passively watching someone succeed.

Everyone loves a loser. It makes us feel better because the loser isn't us. It gives us a chance to pontificate. But when the "loser" is Apple or IBM and they ain't losing, what do we do? Predict they'll be losers and analyze it as though they already were. That's what we can expect to see in 1991: nonfailures.
The Question Isn’t Why Ehman Monitors Cost So Little...
It’s Why Apple And Radius Charge So Much.

We make no apologies for the pricing of our monochrome monitors. Like all Ehman peripherals they’re excellent products and superb values. But it’s hard to explain the gap between Ehman monitors and the two leading brands. It’s even harder to justify it.

You could buy three Ehman two page monitors for the suggested retail price of one Apple two page monitor. Or you could buy three Ehman full page monitors for the price of one Radius full page monitor.

If you think we’ve taken short cuts in quality, think again. Ehman monitors feature exceptional resolution, front mounted controls, U.S. made tubes, and our two-page monitor has true WYSIWYG resolution and a flicker-free refresh rate higher than Apple or Radius. Prices on the Ehman monochrome monitors include card, a tilt/swivel base, a full one year warranty, and, of course, our standard 30 day money-back guarantee.

For those who are in the market for monitors there are a couple of choices. If you don’t mind spending money on expensive labels, buy your next monitor from Apple or Radius. But, if you prefer saving money, call Ehman.

Ehman
Quality Macintosh Peripherals Since 1985
Call 1-800-257-1666 FAX 1-307-789-4656

Please circle 176 on reader service card.
A leading magazine recently polled over 1,400 Macintosh volume buyers on their peripheral preferences. Not surprisingly Radius was the winner among third party monitor manufacturers, while Hewlett-Packard was the leader in printers. Some people may be surprised, however, at the choice for the leading independent hard drive company, Ehman.

Little surprise, really. Ehman has been saving Macintosh users hundreds of dollars for the last five years on their hard drive and removable drive purchases. And Ehman stands behind each purchase with a 30 day, no questions asked, money back guarantee and a 1 to 2 year warranty.

Now, with the introduction of its new E-series line of drives, Ehman stands for more than just affordability. With added features like two AC outlets, dual fuse circuitry, and a new whisper quiet fan, Ehman quality is now unsurpassed at any price. And all Ehman drives now undergo a rigorous 24 hour factory burn-in test before shipping.

If you’ve already bought an Ehman drive, we thank you for making us the number one choice...and encourage you to call today for an E-series upgrade. If you’re in the market for a new hard drive or our popular 45MB removable drive, call us today at 1-800-257-1666 and find out why Ehman has reached the top in customer preference.
While our hard drive
to the top, our price...
Save money on business trips. Don't go.

With the high cost of travel, Farallon's remote communications products offer a better way to get to your clients.

Go to the store instead, and get yourself and your client a copy of Timbuktu/Remote™ 2.0. Timbuktu/Remote 2.0® software lets you view and operate any Macintosh connected to a modem, right from the Macintosh in your home or office. Which means that from across town or across the country, you can solve your clients' software or networking problems as if you were in the same room with them. And with both your screen and your remote user's screen on your monitor at the same time.

If you don't already own a high-speed modem, we provide everything you need in the Timbuktu/Remote Access Pack® including our 9600 bps full-duplex Remote/V.32 modem and a hardware flow control modem cable.

But what if you're already on the road? If you're at a client site or in a hotel room with a Mac and a modem, the Farallon® Portable Pack is the ideal solution. The Portable Pack contains everything you need to hook into a LAN or local phone lines and communicate with others.

For information on these and other products, check out our bulletin boards on America Online, AppleLink, and Connect. (IDs for all: FARALLON.) Or call our Customer Service line at (415) 596-9000. Dealers call our Reseller Hotline at 1 (800) 544-7689 in U.S. and Canada.

Directory Travel to a client's office with the click of your mouse.

File transfer Fast, direct file transfer between any computer.

Security Multiple passwords and call back, even with a Pocketknife

Timbuktu/Remote 2.0
- View and operate another Macintosh over telephone lines
- Two-way file transfer
- Enhanced security (multiple passwords and call back)
- FlexMacCOCI workstation

Timbuktu/Remote Access Pack®
- Timbuktu/Remote software
- 9600 bps Remote/V32 modem
- Remote/Network® modem cables for starting up a Macintosh remotely
- Passive Pack®
- Complete, all-in-one carry case
- Two copies each of Timbuktu and Timbuktu/Remote
- Two Prewired 5 StarConnectors®
- Devices, tools, and wiring accessories, even a pocketknife.

Tel: one copy of Timbuktu/Remote and a modem are required at each location. A 9600 bps full-duplex modem is recommended.

Remote/V.32 modem now with V.42bis data compression

Farallon®
The Personal Communications Company

2000 Powell Street, Suite 900, Emeryville, CA 94608 FAX (415) 596-9639. Timbuktu and the Farallon logo design are registered trademarks, and Farallon, Timbuktu/Remote, Remote/V.32, Remote/Network, Timbuktu/Remote Access Pack, and The Personal Communications Company are trademarks of Farallon Computing, Inc. AppleLink and Macintosh are registered trademarks of Apple Computer, Inc. Connect is a registered trademark of Connect, Inc. America Online is a service mark of Quantum Computer Services, Inc. © 1990 Farallon Computing, Inc. All rights reserved.

Please circle 80 on reader service card.