Power Mac 7100

A ★★★★★★ Winner for under $2900, Page 58

Mac Online Guide
- Pick the Right Service
- Select the Best Software
- Download Stock Photos

Color Printers
16 Inexpensive Models Lab Tested
POWER MACINTOSH RUNS FAST WITH IN STOCK. JUST WAIT TILL YOU SEE IT.

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While it's true that the Power Macintosh® will zip right along with current programs, it'll perform even better with the next version of Microsoft® Office for the Macintosh®.

The programs in the Microsoft Office will not only take advantage of the power and speed of Power Macintosh, they'll also work together. Seamlessly. Effortlessly.

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But we warn you, you'd better fasten your seat belt.

Pick up Microsoft Office for Macintosh now. And we'll send you the new version for Macintosh or Power Macintosh at no charge when they ship in the near future.
You got a Mac. And then a few more. You tied them together. People started sharing. Everything.
Funny thing about the Macintosh computer. With little fanfare and an idea known simply as “plug and play,” it turned a whole lot of novice users into networkers.

And is it any surprise? All you have to do is plug an inexpensive connector into the back of a Mac; and you’re networked. You can share printers. You can share modems. You can even share files with your peers.

This kind of “peer-to-peer” network is all some workgroups need.

Others, however, soon find they’re ready to take the next step: a Workgroup Server dedicated to improving the ebb and flow of vital information.

How do you know if you’re ready? Just ask yourself a few simple questions.

Do I have more than five computers tied together in a peer-to-peer network? Is one printer always backlogged while others sit idle? When people share files, are their systems slowing down? Is there confusion about who has the latest data and where it resides?

If you answered yes to any of these questions, it’s definitely time to consider a Workgroup Server from Apple.

Workgroup Servers provide a centralized place for users to store and share files. Which means your shared files don’t get lost, your systems don’t slow down and users always have access to the latest information.

A server also gives you a place to put network applications and services—accounting programs, databases, e-mail and more—for everyone to use.

And that’s just the start. With print spooling software, users won’t wait forever for your overworked LaserWriter printers. With FileWave software, you can distribute new programs and upgrades from the server, without trekking from Mac to Mac. With Dantz Retrospect Remote, you can back up every system on the network—both clients and servers—automatically. While with Apple Remote Access software, your users can access the network from anywhere.

“OK,” you say, “but how difficult is it to use a Workgroup Server?” It’s as easy as using a Macintosh. All you have to do is connect the components, turn on the power, and you’re ready to go.

Choosing the right server for your workgroup is just as easy. We have six models for all kinds of needs, from the Workgroup Servers 60, 80 and 95 to our newest models based on the high-performance PowerPC “chip” the Workgroup Servers 6150, 8150 and 9150.

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Apple
Special Online Issue

All aboard the online express! Macworld's guided tour of all things online brings you advice on new technologies and resources, what works (and what doesn't), how to connect, and where to go once you're there.

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We talked to the pros when we designed the EPSON ES-800C Pro/Mac to make it the most advanced professional color scanning system in its class. The 1600 dpi ES-800C comes with the full version of Adobe PhotoShop, Kai's Power Tools, one and three pass scanning, dual cpu connectivity, plus built-in color and gamma controls. It's the best equipped, best value professional scanner you can buy.

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Each drive comes with Silverlining™ and one free SyQuest cartridge.

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<th>Drive</th>
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*Drive enclosures vary.

Every drive also includes owners manual, necessary cables, Apple System software and a generous collection of shareware.

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Silverscanner II makes scanning as quick, painless and productive as possible. With features like dynamic color preview (16 sec.), magnify in preview, proof in preview, savable scan settings, up to 400% scaling in 1/2 steps and up to 1600 dpi in 1 dpi steps—all in one pass. It's easy for the beginner and powerful for the advanced user. And it's Macworld's Editor's Choice.

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*While supplies last. Does not include Color II.
Now Utilities has won so many top awards lately, the critics almost seem averse. But when they do speak, you'll find their comments echo those of author/consultant Bob LeVitus, who calls Now Utilities "a must have for any serious System 7 user." Why all the fanfare? Because Now Utilities makes your Macintosh so much faster and easier to use.

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**More Control.**

Now Utilities puts you in control. If you use Times the most, just drag it to the top of the Font menu. Fonts appear in their actual typefaces, so you choose the right font the first time. You can also arrange extensions and control panels in the order they work best, and link together extensions that require each other.

**Keeps You Going.**

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InfoFAX
Please see page 189 for instructions.
Beyond the Power Macs

Charting a course for Apple's continued success

Under the surface of the Macintosh market the twin streams of optimism and doubt flow perpetually. The brilliance and refinement of the Macintosh design continues to inspire users. At the same time, the foreboding mass of the PC market, roughly ten times the size of the Mac market, always seems to raise doubts about the Mac's long-term survival. Ten years have passed since the Mac's introduction, and these currents continue to ebb and flow.

The introduction of the Power Macs is a major milestone. It's time to reexamine the challenges facing Apple.

The Power Mac Success

Ninety days after the introduction of the Power Macs, it appears that Apple has done a phenomenal job of managing the transition to the PowerPC architecture. The machines are selling extremely well, and Apple has by and large kept up with demand. The Power Macs offer an unprecedented price/performance value. According to a Macworld price survey, two of the three Power Mac models (the 6100/60 and 7100/66) meet or exceed the price/performance of similarly configured Intel Pentium-based PCs (see Power Mac News, this issue). And there are no major software-compatibility problems, a remarkable achievement considering the changeover to RISC. This is the first time a mainstream personal computer platform has converted architectures and maintained the usability of and investment in the installed base of applications. By early autumn most major Mac applications will be available in native Power PC versions, which means more users will buy Power Macs without hesitation. Furthermore, by successfully partnering with IBM and Motorola to create the PowerPC processor family, Apple has demonstrated that it can build and sustain strategic alliances of a scale necessary for its future survival.

But despite the reinvigorated hope that the PowerPC has provided for the Macintosh, more challenges lie ahead. And since optimism and doubt about the Mac go hand in hand, let's anticipate some of the doubts. The impending introduction of Chicago (the next version of Microsoft Windows) will test whether the Mac offers enough unique value to users for them to swim against the DOS/Windows tide. As always, Mac and PC users will spend many fruitless hours arguing their convictions. What must Apple do to put these arguments to rest? The answer is not new: Apple must continue its quest to significantly increase its market share while strengthening the unique advantages of the Macintosh.

Licensing—Again

The perennial doubts about the Mac's survival continue because there are so many more DOS and Windows machines. To lessen doubts and gain leverage in the marketplace, Apple must make two major moves to increase its percentage of the market. The first move is to work toward a standard hardware platform, and the second is to license the Mac Operating System. It would have been a mistake for Apple to have licensed the Mac OS in the last few years, because the company was not prepared to live on lower margins and could not have withstood competition from less-expensive Mac clones. In hindsight, Apple's previous opportunity to license was three or four years ago, before Windows had really established itself, and the Mac was still unique. But now that Apple has cut its operating costs, dropped the Mac's prices, and improved the Mac's performance, the company has another opportunity to license the Mac, and it must take the plunge in a big way. Although there are still some compelling financial reasons not to create competition by licensing the Mac OS, the fear of lowered profits should be offset by the opportunity to be a survivor in the market-share wars.

To create a standard hardware platform, Apple needs to work closely with IBM on the PReP specification for PowerPC-based microcomputers, to make sure that complete Macintosh capability can be added to PReP-compliant machines. Sources inside and close to the two companies indicate that these efforts are continuing. Both companies stand to benefit from promoting broad support for a PowerPC-based platform. The result of these two major players' combined efforts in the PC market will be that people will listen and reconsider this alternative to the Intel-based platform. IBM is also more capable of selling into major corporations, which would complement Apple's sales and add key customers to the installed base. On the second point, Apple should also offer IBM an OS license that's attractive enough to overcome any Big Blue reluctance to sell Macintosh OS-based machines to its business customers. Increasing the number of PReP-compliant computers doesn't guarantee that these machines will all be running the Macintosh OS. However, the Mac OS is the only operating system that has a large number of users and mainstream desktop applications and can run on the PowerPC. This gives Apple—and would give IBM—a big advantage.

Continue
Apple should also license its OS to one leading PC maker in addition to IBM. Apple doesn’t have to license to everyone right away, but sewing up a second license with a firm like Compaq or Dell would greatly affect the perception of the Macintosh architecture and provide access to new customers. Apple will probably have to offer a very attractive deal to this company to convince it to invest in a new market, but Apple should do whatever it takes. Licensing a major clone-maker besides IBM would hold the attention of new customers and developers. The two main dangers are that Apple would lose some sales, and licensing would complicate the evolution of Apple’s technology. But Apple would also gain (licensed) sales it would not have otherwise made: it must be willing to lose some hardware sales, in order to grow its market overall. It is now time for Apple to make a bold move and embrace some risk to boost its momentum.

Innovation
Whatever Apple does, it must maintain the identity of the Macintosh. The Mac has always been unique, special enough that people are willing to go against the tide and buy one. There is tremendous pressure to buy the same system that most other people use. For instance, if you work in a large organization that uses mostly DOS and Windows computers, your MIS manager probably would rather not have to support Macs. As long as Apple owns a significantly smaller share, it needs to differentiate the Mac with unique features. Otherwise users and companies will likely migrate to the most commonly used platform.

The problem is that the Mac is not as obviously different as it once was. People who haven’t spent much time with a Mac can’t see a big difference between Windows and the Mac (anyone who uses the acronym GUI—pronounced gooey—is suspect). With the introduction of the Chicago version of Windows, the distinction between the Mac and Windows interfaces will likely blur even further. You have to spend some time using a Mac to appreciate the difference in quality. Then major differences in usability become apparent. But the difference is no longer evident at a glance, and both share many of the same applications.

Apple must evolve the Mac so that customers can tell at a glance that it is unique. This will require an interface and applications that provide an engaging new dimension. Apple must integrate video and sound into the system so thoroughly that users interact with them as second nature—not simply as novelties or specialized applications. Apple should also design the Mac to be the preeminent platform for communications. People are spending an increasing percentage of their time managing E-mail, faxes, voice mail, online communications, presentations, file transfers, and other forms of communication. If the Mac were clearly better at unifying and simplifying all of this activity it would have a big advantage.

Perhaps most important of all, Apple must convince developers that the Mac offers unique opportunities for success. In the end it will be the creativity and vision of developers that drive the next wave of compelling applications. The developers must have the proper tools and a foundation upon which they can innovate. Instead of spending countless dollars on ancillary businesses such as the Newton, Apple should commit major funds to encourage and support its Macintosh developers. They have always been a key to Apple’s success, and they are the likely source of Apple’s long-term survival.
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As you'd expect from any computer named Macintosh, the Power Macintosh runs thousands of powerful, off-the-shelf business programs.

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On Copyright

UCH A NOTICEABLE OMISSION from the “How to Avoid Copyright Conundrums” sidebar regarding photographic images hurt (“Are You Breaking the Law?,” May 1994). If your project required music with vocals, would you sing it yourself because you own a cassette recorder? Would you make up your own typeface because you know how to write letters of the alphabet? Or print a brochure yourself because you have a copier? Yet you advise readers that the next time they need a photograph as a source for an illustration, they should shoot it themselves with a 35mm camera.

Casual familiarity with common devices imparts neither technical nor creative proficiency.

How about this helpful suggestion instead: Hire a real photographer! Your copyright usage needs can be a part of the discussion right from the start, and a good professional photographer will deliver professional results.

Peter Billard
Glastonbury, Connecticut

Undoubtedly, there are many situations in which you need the services of a professional photographer. On the other hand, I spoke to several illustrators who have begun taking their own photos of simple objects—a bridge, a park bench, a boat—and incorporating and manipulating those images into larger, computer-generated illustrations. To follow Mr. Billard’s line of comparison, hiring a professional photographer, when all you need is a usable image, is like hiring an accountant to fill out the 1040EZ form.

—James A. Martin

I found your article on the use of copyrighted material (a subject that has mostly been overlooked by the computer media) interesting. You wrote that “depending on how an image from an old magazine is used, the likelihood that someone would recognize the original work and contest its reuse today is probably low.” It is very distressing to me to hear that it is a bad idea to steal someone’s work only if you are likely to be caught.

The law is clear: a photographer’s work is covered under copyright from the moment the photographer presses the button. Like most photographers, I enjoy seeing my work in print, and therefore my usage prices are usually reasonable. It is certainly not a game to see if you can use someone else’s work without getting caught.

Thanks for your article—it’s a start.

Ray Harold
San Francisco, California

I quoted experts who believe it’s unlikely that an insignificant portion of an image lifted from an old magazine, then manipulated and collaged into a new illustration, will become the source of a copyright-infringement case. However, I also clearly stated in several places that it’s always best to get permission to use someone else’s image.—J.A.M.

Although I’m a firm believer in copyright protection, I would hardly look to the royalties on digital audio tape (DAT) players for “inspiration.” The reality is that amateur musicians who use DAT for creating their own music are forced to pay a “royalty” to established performers who already have legitimate avenues for royalty collection (BMI and ASCAP). What will be next? Will the Software Publishers’ Association lobby for a disk tax to compensate for possible software piracy?

Greg Scheer
Wilkinsburg, Pennsylvania

PowerPC Bits

READY TO UPGRADE TO POWERPC? Maybe not, depending on the monitor you choose. The on-board video of the Macintosh Quadra/Centris 610 supports monitors up to 21 inches in 8-bit color, and up to 16 inches in 16-bit color, but the Power Mac 6100’s on-board video maxes out at 8-bit color on a 16-inch monitor.

If your monitor is larger than 16 inches, you must buy either a NuBus card or a smaller monitor. Sign me: Not Ready to Downgrade.

Gary Van Handel
Houston, Texas

I am extremely disappointed by the packaging of the Power Macs. We have a new level of computing power placed inside the same old, boring, and unfashionable case. The PowerBook didn’t become one of the most popular portables because it looked like its competitors. Can Apple put a little more effort into the external design of its computers? The benefits we could gain may be well worth the effort.

Kevin McGinty via America Online

Mistaken Identity

I was shocked by the cover of the June 1994 issue of Macworld. The square and compass, shown as tattoos on the muscular arms in the photograph, is
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COReCTIONS

- The June 1994 "Video-Editing Tools" feature incorrectly stated that the Grass Valley Group is owned by Carlton Communications. In fact, Tektronix owns the Grass Valley Group.
- The try-leading CD-ROM drive in the Power Macintosh 6100/60 was introduced in the LC 575, not the Quadra 605 (Reviews, June 1994).
- Version 4.0 of Adobe Premiere costs $597 for users upgrading from version 3.0, and $129 for users upgrading from versions prior to 3.0 (News, June 1994).
- Opus Systems' OMS fixes MIDI problems for the PowerBook modem port only, not the printer port (Letters, June 1994).
- The May 1994 article "Does PowerPC Beat Intel's Best CPUs?" incorrectly described a micron as being a millionth of an inch. In fact, a micron is a millionth of a meter.
- Nanan's rebate offer of $100 applies only to customers who purchased monitors between January 1 and March 31, 1994 (News, May 1994). Also, the offer expired April 30.
- Decathlon Corporation's LogosuperPower product also comes in Aldus FreeHand format (New Products, May 1994).
- The Power Macintosh Upgrade Card is not available for the Mac IV, IIfx, or Performa 600; instead, users of those Macs may replace the motherboard with a Power Macintosh 7100/66 or 7100/66AV motherboard (PowerPC News, June 1994).
- Golden Triangle has not folded, as indicated by a headline in the June 1994 MacBulletin. As correctly reported in that news item, the company is reorganizing.

Freer Trade

OLA AMIGOS! WITH ALL THIS talk about the North American Free Trade Agreement, you'd think the mail-order companies would take advantage of the million-dollar market right next door in Mexico.

In all of the 50-plus computer publications we receive at our university, we found only one international toll-free number—this out of more than 300 direct-sales firms. Computer companies across America, drop us a line. If it's toll-free, all the better.

James Milford
Merida, Yucatan, Mexico

But Where's the Reset Switch?

REGARDING GUY KAWASAKI'S correlation between his firstborn and his Mac; he is right on the money (Wiseguy, May 1994). A man might better understand the impact that a new baby will have on his life if he stops to remember the day he bought his first computer.

I struggled through late-night feedings, ear infections, reduced income, and the day-care nightmare; then I bought my first Macintosh. What have I learned? Not to take crises and error messages so seriously!

Laurie Curtis
Somers, Connecticut
It seems impossible to find a hard drive that’s large enough to fit your storage needs today. That XL hard drive you just bought is now full.

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Easily bridge your LocalTalk LaserWriters to an Ethernet network. It works with any brand of LocalTalk-compatible network printer or other LocalTalk devices such as Macs. With a BNC connector for thinnet and RJ-45 for 10BaseT, you have the ultimate in network flexibility. Includes an easy-to-use security and management utility. For a limited time, get a FOCUS TurboNet to connect your LocalTalk line to the EtherLAN Print. Our free with any EtherLAN Print purchase. Choose the EtherLAN Print which supports two printers for $279.99 or the EtherLAN Print Plus which supports up to six LocalTalk devices for $399.99.

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Apple Drops DOS-Compatible Card
After only two and a half months, Apple discontinued its DOS Compatible Card, which put a 25MHz 486SX-based PC inside a Centris or Quadra 610. At press time Apple said it would also discontinue the preconfigured Mac Quadra 610, DOS Compatible system on June 13.

Apple Cuts Prices Yet Again
Apple recently cut the prices of selected peripherals, PowerBooks, and Quadras. The price of the Quadra 660AV 8/230 dropped 20 percent, to $1499; the same version with a CD-ROM drive fell 18 percent, to $1799; and the 8/500 model went down 14 percent, to $2369. The Quadra 950 0/1000 Publishing Configuration was cut 15 percent, to $6229. Price cuts on models of the PowerBook 145B and 165 ranged from 12 percent (down to $1259 for the 145B 4/80) to 27 percent (now $1699 for the PowerBook 165 4/160 with Express Modem). The PowerBook Express Modem Kit was slashed 33 percent, to $215. Apple also reduced the price of the OneScanner by 20 percent, to $699; of the LaserWriter Select 300 by 18 percent, to $600; and of the 14-inch Macintosh Color Display by 21 percent, to $399.

Radius and SuperMac Join Forces
Two leaders in the Macintosh graphics and digital-video hardware market have announced their intention to merge. Subject to shareholder and federal approval, Radius and SuperMac will come together in a deal valued at approximately $80.5 million. No changes in operations will occur at either company until October, according to SuperMac. If the merger is still on, at that time the companies will announce their product strategies for implementation.

120MHz PowerPC 601 Chip
In a technology demonstration at Apple's recent Worldwide Developers Conference, IBM and Motorola showed a 120MHz version of the PowerPC 601 processor running in a prototype Macintosh. The 120MHz chip is 20 percent faster than the fastest previous 601 chip, a 100MHz model that is available in small quantities but is not yet used in a shipping Power Mac (see MacBulletin, Macworld, June 1994). Apple said that the system shown was not guaranteed to be produced but was intended to show developers the capability of the PowerPC chip architecture.

Native Photoshop Does Layers
The long-awaited upgrade to Adobe Photoshop, which will support multiple layers, is expected to ship by September of this year. Other new features of 3.0—a native PowerPC release—include CMYK preview, floating customizable palettes, color masks, and additional filters. For $895, you'll get a CD-ROM version as well as the standard floppy-disk set; upgrades are $149. 415/961-4400, 800/833-6687.

QuickMail Goes 3.0
CE Software has announced an August ship date for version 3.0 of QuickMail. The client-only upgrade features rules-based mail management (filtering messages based on preset criteria), multiple-criteria searches of messages (including sender, subject, and body text), and a spelling checker. A ten-user pack retails for $649; current users can upgrade for $12 per client; and users who purchased version 2.6 after June 13 will get the upgrade for free. 515/221-1801, 800/523-7638.

QuickDraw GX Predux
By the time you read this, QuickDraw GX, Apple's long-delayed enhanced imaging architecture, should be shipping—but not from Apple. Peirce Software's Peirce Print Tools ($129), a collection of GX printing extensions, also includes GX (which can be installed under System 7.1). Apple plans to ship GX as part of System 7.5 later this year. Peirce, 408/244-6554, 800/828-6554.
Taligent Rising

In 1992, the earth shook: IBM and Apple clasped hands and pronounced themselves allies. From this union sprang Taligent, a small Cupertino, California, company that's now developing nothing less than a universal operating system. When complete, the Taligent OS will be scalable and platform-independent, running on machines based on Intel, PowerPC, and Hewlett-Packard PA-RISC processors. If Taligent is successful, the days of linking an operating system to a particular chip will be over, and the computer industry will again have to adjust to a new way of doing business.

What's inside a universal operating system? Based on a combination of IBM's Mach 3.0 microkernel and Apple's long-term system-software project code-named Pink, Taligent's operating system is completely object-oriented. Users move through a desktop world populated by People, Places, and Things, manipulating data with tools that are less individual applications than they are extensions of the core system. On a lower level, Taligent's microkernel architecture means that a relatively small chunk of code handles most or all of the interaction with the CPU and other hardware. You can add support for something as simple as a peripheral or as complex as a networking technology just by writing a new system software module. Developers create programs by adding on to frameworks—software objects that handle basic application services. A graphics framework, for example, would include a generic interface, plus rudimentary drawing and painting tools. A 3-D modeling company could take the graphics framework and add modeling and display algorithms. The theory is that developers, freed from generating the huge amounts of interface code demanded by today's event-driven software, will be...
able to concentrate on innovating and improving core technologies. Completed applications will plug into Taligent’s Application Framework, which will be entering beta testing as you read this and is expected to be available in the first half of 1995. This first release will run alongside several existing industrial-strength operating systems, including OS/2, AIX (IBM’s Unix), HP-UX (Hewlett-Packard’s Unix), and eventually PowerOpen (which is based on AIX and will replace Apple’s A/UX). Desktop computers will have to wait, though, as Taligent places heavy requirements on an OS, including full 32-bit compatibility, preemptive multitasking, and protected memory. Even for the hardware heavy-hitters, the complete Taligent system architecture won’t appear until later in 1995, and after that, migration down to the desktop level will be a lengthy process, because of both hardware and software requirements.

Waiting for Applications

So who’s going to write software for this OS wunderkind? Porting software to a new operating system is never easy, and committing to the Taligent OS is an even greater step, as most companies will have to rewrite their applications from the ground up to make them work in Taligent’s new order. Taligent, on the other hand, contends that its system software, frameworks, and object-oriented approach will cut development time enough to make the transition worthwhile.

Nevertheless, vendors will be reluctant to adopt Taligent until it’s clear that a reasonably large market exists for its products. On HP and IBM Unix machines and on Macintoshes, the Application Framework will act as a stepping-stone to the full Taligent operating system, but at this time no such stepping-stone exists for Intel-based platforms. However tempting it may be to contemplate the drama of an operating system showdown, Taligent officially denies any intent of being a Microsoft killer, and the realities of the market predict a Windows-compatible Application Framework at some point. Otherwise, Windows devotees moving to Taligent would have to make the kind of complete and sudden transition that end users hate. Furthermore, Microsoft would have little incentive to port versions of its own business applications.

One thing that will smooth the road to Taligent is OpenDoc, Apple’s cross-platform vision for component software. OpenDoc will get developers used to writing reusable and self-sufficient software objects, while it gets users adjusted to a more document-centered, task-oriented work environment. Also, because Taligent is a founding member of CILabs, the independent company that’s monitoring OpenDoc compatibility, OpenDoc developers can be reasonably certain that this path to Taligent won’t drop out from under their feet.

Will Taligent succeed? The Apple-IBM partnership appears to be batting one-for-one with the success of PowerPC, and as bizarre as it sounds, the future of the relationship looks good. The recent addition of Hewlett-Packard as an investor in the company also augurs well for Taligent’s prospects, especially since one of the keys to Taligent’s success will be its adoption by large corporate buyers for use on their enterprise systems.

What does Taligent mean to current Mac owners if it does succeed? Probably not much for about two years. Apple’s current thinking is to (1) ship Taligent’s Application Framework on top of PowerOpen in 1995, (2) ship a full system with Taligent running native on Apple hardware with initial sales to enterprise clients, and (3) evolve the Mac OS to the point where it can handle the Taligent Application Framework—currently expected to be sometime in 1996, with the project currently code-named Gershwin (see “Apple Tells Its Software Future” in News, Macworld, June 1994), although a tricked-out Chicago (Microsoft’s next-generation Windows OS) could force Apple’s hand. The tip sheet says don’t look for People, Places, or Things on your desktop anytime soon. But in the long run, for both Apple and end users alike, Taligent’s vision of an object-oriented, cross-platform OS might be too tempting to pass up.

—Cameron Crotty

Hi-Res Color Ink-Jet

While Hewlett-Packard and Apple have been going after color ink-jet SOHO customers hammer and tongs (see “Battle over Color Printers,” News, May 1994), Epson America hasn’t been sitting still. In fact, the company has just announced its entry into the market: the Color Stylus, a color ink-jet printer that can print at 720-dpi true resolution. Of course, in order to achieve this resolution, you need special paper, which Epson sells for $24 for 200 sheets, more than ten times

SuperMac Adds II Spigot

Spigot II Tape is the latest in SuperMac’s VideoSpigot digital-video hardware line. The full-size NuBus card encompasses the functions of the original VideoSpigot and adds a composite-video-out port, support for recording to tape, and additional minor improvements. Spigot II Tape ships with SuperMac’s ScreenPlay II software and lists for $999. 408/541-6100, 800/334-3005.

CoSA Revives Hitchcock

CoSA, a division of Aldus, recently began shipping the resurrected Hitchcock, an application for professional nonlinear video editing. Hitchcock supports 60-fields-per-second video at 640-by-480-pixel resolution using JPEG compression. It also includes stereo audio, produces edit-decision lists, and exports files as QuickTime movies. It is designed to work with the most common Macintosh JPEG video-digitizing boards. 206/343-4208.

Catalog for People with Disabilities

Apple’s new mail-order service, called Aisle 17, offers assistive technology products to adults and children with disabilities. Among the products will be Macintoshes bundled with various devices, such as the Co:Writer writing assistant. Aisle 17 is open 24 hours a day, seven days a week, but is available only in the United States for now. 800/600-7808, for TTY devices 800/755-0601.

Lotus Drops the Mac

After a long history of futility in developing for the Macintosh (Jazz, for example), Lotus has announced it will do no new development for the Mac Operating System, with the exception of communications products including Notes and cc:Mail. 617/577-8500, 800/343-5414.

In Brief
times the cost of ordinary printer bond. Users can proof their images at 360 dpi and use the 720-dpi resolution for final output.

Using Epson’s proprietary piezoelectric ink-jet technology, the Color Stylus is standard mode prints at 360 dpi on any kind of paper. The base model is a serial QuickDraw printer, and although Epson sells a LocalTalk upgrade card, the company currently has no plans for an Ethernet upgrade. Similarly, Epson expects to update the driver and add a ColorSync model when QuickDraw GX appears but has no plans for PostScript emulation.

Print times for the Macintosh model were not available at press time, as the driver software was incomplete, but Epson claims that at 360 dpi, the Windows configuration of the Color Stylus is twice as fast as comparable printers, and slightly faster even at 720 dpi. Whether or not this speed makes it to the Mac remains to be seen. The printer uses two ink cartridges: one containing black ink and the other containing the cyan, magenta, and yellow inks. You'll be able to replace the black ink cartridge separately when it runs out—replacement costs were not available at press time. The Color Stylus handles up to legal-size paper and ink-jet transparencies, although you can print only at 360 dpi on transparencies. The Color Stylus is expected to ship this fall for $349 (street price). Epson America, 310/782-0770, 800/922-8911.

—CAMERON CROTTY

Stackable Storage

MODULAR DRIVES AT NO PREMIUM

La Cie has designed the Joule Modular Storage System, a series of stackable storage modules including hard drives, tape drives, SyQuest removable-cartridge drives, and optical drives. Up to seven of the SCSI devices can be stacked, mixed, and matched. La Cie will offer Joule drives in different sizes—full-height, half-height, and ½-inch—each with the hardware to fit it into the Joule system, and for about the same price as an ordinary storage device of the same capacity.

Each Joule system starts with a base unit that includes one storage device; a 100-watt universal power supply; and a top cap, which covers the connectors in the top drive of the stack and includes the single SCSI cable that connects to the Macintosh. Another feature of the Joule system is portability: any drive except the base can be plugged into or pulled out of the stack (by sliding it in or out) without breaking the SCSI chain, although the system must be turned off.

A typical base unit with a 340MB hard drive lists for $389. Hard drive module prices start at $259 for a 170MB version and top out at $2339 for a 2GB device. Other available base units are a $539, 105MB SyQuest drive and a $689, 270MB SyQuest drive; both SyQuests are also available as modules. Other modules include 5GB and 8GB DAT drives, 155MB and 600MB tape drives, and optical drives in either 128MB or 230MB versions—all modules and base units are currently shipping. La Cie, 503/520-9000, 800/999-0143.

MultiSync 2V Monitor

LOW-COST COLOR

Designed mainly for the home- and small-office markets, NEC’s MultiSync 2V is a 14-inch color monitor that shows up to 1024 pixels by 768 pixels and has an estimated selling price of $335. The display has a 0.28mm dot pitch, and its automatic digital controls adjust the size of the active viewing area and its centering.

The MultiSync 2V complies with the EPA’s Energy Star power-saving guidelines and with the MPR II guidelines for emission of electromagnetic fields. Slated to ship on June 13, the 2V will come with a three-year warranty. NEC, 708/860-9500.

Big Arrays

MICRONET EXPANDS RAVEN LINE

For those who desire to frolic in a firehouse of data, MicroNet has announced seven new, high-speed, high-capacity drive options. The top of that company’s Raven line now includes a 17.3GB dual-drive, SCSI-2 Fast, RAID Level 0 array that comes in two flavors: one for the Quadra 900 and 950 and Power Macintosh 8100, and one for the Quadra 650, 800, and 8400A. The difference between the two pack-

BUGS & TURKEYS

Apple changed the EtherTalk protocol for its LaserWriter Pro 630 and 630H. As a result, equipping one of these printers with a Farallon EtherWave transceiver slows print jobs to a crawl. Users hit by this slowdown can either use a non-EtherWave transceiver on their 10BaseT chain leading to the 630 or 630H, or contact Farallon for a free hardware device that, when placed between the printer and transceiver, fixes the problem.

The MacPro Plus keyboard from Key Tronic won’t work if you’ve got a trackball connected to it. The problem shows up as soon as you restart your Mac. Key Tronic hopes to have a fix available soon.

The LC 575’s new Energy Saver control panel is supposed to allow users to specify a period of inactivity after which their monitor shuts off. However, restarting the Mac returns the control panel to its default setting of 60 minutes before shutdown. Apple said it hopes to fix the problem soon.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See How to Contact Macworld.
Ages is that the former connects to the built-in SCSI ports of the Quadra 900 and 950 and Power Mac 8100, while the latter ships with the company's NuBus slot and provides an extra SCSI port. The Raven 17.3GB array uses two 5.25-inch, 9GB Seagate drive mechanisms (see "Big Drives," News, in this issue), and features an average access time of 6.3ms. When connected to a Quadra 900 or 950 or a Power Mac 8100, the new Raven can sustain a data-transfer rate of 7.2 MBps, but it tops out at 6.8 MBps when connected to a Quadra 650, 800, or 840AV. The array alone will retail for $15,980; with the NuPort III card, the price jumps to $16,280. In related news, Storage Dimensions has also announced a 17GB array based on the new Seagate mechanisms that is expected to ship in June. Its price was not set at press time.

The Raven Shuttle places two removable 3.5-inch Seagate hard drive mechanisms in a SCSI-2 Fast array, combining speed and portability. Users can get up to 4GB with an average access time of 6.3ms and a sustained data-transfer rate of 8 MBps. Prices will range from $3995 to $7395, depending on capacity.

MicroNet has also announced a Macintosh version of its RAIDbank SCSI-2 Fast disk array system for the Quadra 650, 800, 900, 950, and 840AV. The new RAIDbank can now support six drives for up to 12GB of storage with an average access time of 8ms to 11ms and a sustained data-transfer rate of 7.2 MBps. The RAIDbank supports RAID Levels 0, 1, and 5, and will ship in July for $3995 for a desktop model, $3895 for a rack-mount model, and $4095 for a tower-case model. MicroNet, 714-453-6000, 800/800-3475; Storage Dimensions, 408/954-0710.—CAMERON CROTTY

### The AmCoEx Index of Used Mac Prices

<table>
<thead>
<tr>
<th>Machine/RAM/Hard Drive</th>
<th>Average Sale Price</th>
<th>Monthly Change</th>
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<tbody>
<tr>
<td>PowerBook 100/4MB/20MB</td>
<td>$675</td>
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<td>PowerBook 140/4MB/40MB</td>
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<tr>
<td>Quadra 900/8MB/160MB</td>
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Index provided by the American Computer Exchange of Atlanta, Georgia (404)786-0710. It reflects sales during the week of May 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

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### Big Drives

#### 4GB AND 9GB SEAGATE MECHANISMS

Seagate has announced two SCSI-2 Fast hard drive mechanisms: the 3.5-inch, half-height, 4GB Barracuda and the 5.25-inch, 9GB Elite. The new Barracuda features a 12ms average access time and a sustained data-transfer rate of 6.5MB per second. Several companies have said they are considering the 4GB Barracuda for their external drive product, but only a few, including Compro, APS, and ClubMac, have set pricing. Compro's retail price for the MD4303 is $6249, and APS's price is $3799; ClubMac will sell its external drive for $3599. Drives based on the Barracuda 4GB mechanism will be available in quantity in July or August.

The 9GB Elite will be available in June, and more companies have committed to selling the drive, at prices ranging from $5500 to $8000. Look for drives from Compro, APS, Storage Dimensions, MicroNet, FWB, Focus, and ClubMac, among others. Micropolis is racing Seagate to market with its own 9GB mechanism that has an average access time of 12ms and a sustained data-transfer rate of 4.3 MBps to 6.5 MBps. Micropolis expects to sell internal versions for between $2500 and $3500; external versions will run between $6240 and $6600.—CAMERON CROTTY

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### In Brief

#### Mac Tracks FedEx

Got a Federal Express account number, a System 7 Mac, and a modem? Then you can use FedEx's Tracking Software to find out what your packages are doing, day or night. Once you type in a package's tracking number, you can follow your item's journey from pickup to delivery and find out when, where, and to whom it was delivered. Getting an account number is free, the software is free, and using the software is free, as Federal Express has set up an 800 number for Tracking Software calls. Federal Express, 800/238-5395, international 800/247-4747.

#### Encyclopedia Price Cut

Compton's NewMedia has reduced the price of its Interactive Encyclopedia from $395 to $149.95. The company said it is "testing" the new price. Compton's NewMedia also ended its Upgrade and Switch competitive upgrade program, which allowed owners of other electronic encyclopedias to trade them in and receive the Compton's Interactive Encyclopedia for $149. 619/929-2500.

#### Virus Watch

Central Point and Symantec are both offering additions to their virus-protection software that detect and destroy the new INIT 29-B virus, which is capable of affecting all Macintoshes. Users of Symantec AntiVirus for Macintosh (SAM) 3.5 can upload the new virus definition into SAM Virus Clinic from the Symantec bulletin board (503/484-6699 for 2400 bps, 503/484-6669 for 9600 bps) or from Compuserve, America Online, or AppleLink. For a $12 version on disk, call 503/484-6500 or 900/441-2724. Users of Central Point Anti-Virus for the Macintosh can get the update from the company's BBS (503/690-6650 for 2400 bps, 503/490-7777 for 9600 bps) or from the same online services or the Internet.

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![The MicroNet Raven 17.3GB array comes in two boxes, each with a 9GB Seagate drive mechanism.](image)

![The Elite from Seagate is a 5½-inch SCSI-2 Fast hard drive with 9GB capacity.](image)
It used to be that unless you had a lot of money to spend, a scanner was simply out of the picture. But now there's Agfa StudioScan, the new feature-rich scanner that's wonderfully affordable.

StudioScan offers the speed and efficiency of one-pass scanning for both black-and-white and color images. Its flatbed design accommodates sizes up to 8.5" x 14", and an optional transparency module scans 35mm slides up to 8" x 10".

What's more, StudioScan comes with a complete software package, including Agfa's proven labor-saving FotoLook," FotoTune LE," FotoSnap" programs, and Adobe PhotoShop LE. Compatible with both Macintosh and PC systems, StudioScan actually guides an entry-level user through the entire scanning process.

To find out more about StudioScan's high-quality imaging for your layouts, in-house publications, illustrated reports, and more, call 1-800-685-4271 today. And discover the Agfa scanner that offers first-class features at an economy price.

AGFA

The complete picture.

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Circle 158 on reader service card
Did Vendors Deliver?

MOST PRODUCTS SHIPPED AS PROMISED

With the introduction of the Power Macs in March, Apple and third-party developers promised a wide array of native software options and hardware upgrades. Now that the dust has settled, were the promises hype or reality?

Upgrades Historically, in the mad dash for more, better, and faster, Macintosh owners wanting the latest upgrade often stumbled because the Apple-produced upgrades simply weren't available in sufficient quantity. Apple seems to have reversed that trend with its PowerPC upgrades and motherboard replacements for Centris and Quadra Macs.

An informal survey of Apple-authorized resellers across the country shows that most carry both the PDS upgrade card and the motherboard replacement (we asked about the 6100/60 upgrade). Some dealers, especially in rural areas, special-order the items as they're requested and were quoting waits of one day to two weeks.

Native software In February, 27 vendors claimed they would have native versions available within 30 days after the March 14 Power Mac introduction (see "Power Mac Software," Macworld, May 1994). But almost a third of them had still not shipped as of June 1.

Among the tardy is none other than Apple Computer, which promised that a native version of PhotoFlash 1.1 would be available at the time of the Power Mac introduction. Other notably tardy products include Macromedia's MacroModel 1.3, Nisus Software's Writer 4.0, National Instruments' HiQ 2.1, Gryphon Software's Morph 2.3, and Dayna Communications' Profiles 1.0.

One company delivered early: Aldus shipped FreeHand 4.0 a month before it had promised to do so.

—SUZANNE COURTEAU AND MATTHEW HAWN

Prices Beat Some PCs

6100 IS CHEAPER THAN 60MHZ PENTIUM PCS

Appic has mostly delivered on its promise to sell Macs at similar prices to equivalent Windows PCs. Despite a steep drop in the prices of Pentium-based PCs, a Macworld survey of prices shows that, on average, a Power Mac 6100/60 system costs about $300 less than an equivalent 60MHz Pentium PC. But the Power Macintosh 8100/80 costs about $1300 more than an equivalent 90MHz Pentium PC. The average price for a 7100/66 system runs about $200 more than for a 66MHz Pentium PC.

The table "Prices: Power Macs versus Pentium PCs" shows our survey results. Keep in mind that prices do vary by type and location of sales outlet. Our prices reflect what you'll find in major metropolitan areas.

To make sure we were comparing similar systems, we added the costs of missing components, such as the key¬board and monitor for the Power Macs (about $600) and the network and sound cards for the PCs (about $250). For the high end, we compared prices of systems equipped with double-speed CD-ROM drives, 500MB hard drives, and 16MB of system RAM.

We also compared prices of midrange systems (8MB of RAM, a 240MB hard drive, no CD-ROM drive, and no sound card).—GALEN GRUMAN

Prices: Power Macs versus Pentium PCs

<table>
<thead>
<tr>
<th></th>
<th>Midrange System</th>
<th>High-End System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Mac 8100/80 (dealer)</td>
<td>$1400</td>
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</tr>
<tr>
<td>90MHz Pentium PC (dealer)</td>
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<tr>
<td>60MHz Pentium PC (mail-order)</td>
<td>$2700 (+$200)</td>
<td>$3200 (+$400)</td>
</tr>
</tbody>
</table>

Prices in parentheses show difference compared with the equivalent Power Mac. Prices are based on an informal survey; see text for system configurations.
The 1994 CD-ROM Expo: Profiting From Digital Publishing
October 5-7, 1994 • World Trade Center • Boston, MA

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The State of the Art.
Here's what's going on in our head. Pencil sketch is scanned into Adobe Illustrator. Rainbow color effect 1 is created with Linear Gradient. Scanned eye 2 is colorized in Photoshop to simulate a sunglass effect. Grid of green & black in the other lens 3 is altered with Twirl filter. Circles are added to the bottom of the letter "A" 4. Pathfinder filter unites them. Letter is imported into Adobe Dimensions" which adds perspective. Brush stroke 5 is created with the Calligraphy tool and then painted with multi-color Gradient. The spreadsheet chart 6 is converted into an Acrobat PDF file and imported. Light bulb glow 7 is achieved with Shape Blending tool. Punk filter creates spikes 8 on globe. Entire ad was created and spell checked using Adobe Illustrator 5.5.

Adobe is pleased to announce a mind blowing upgrade. The leading illustration and page design program for Macintosh® now becomes a more powerful, all-encompassing creative resource. Adobe Illustrator™ 5.5 for Macintosh runs native on the new Power Macintosh®, and it’s loaded with features that add power and automate tasks once difficult or impossible in other drawing programs. New features include trapping and text handling tools like tabs, smart punctuation and a spell checker. And you can import, export and edit any document from any application using the Acrobat Portable Document Format (PDF). You also get a free CD-ROM with 220 Adobe Type 1 fonts, tips and techniques, clip art and more. This upgrade has it all.

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AT'S T 520

This hard drive fits in any PowerBook or Duo and provides just over 500MB of formatted storage. The AT'S T 520 features an average access time of 26ms and comes bundled with the company's PowerTools hard drive utility software. Dantr Development's DiskFit Direct backup software is also included. One version of the drive comes in an external enclosure with a rechargeable battery that lasts up to four hours. Internal $899; external ( Companion II enclosure) $989; AC/DC portable with battery $1039; configured for LaserWriter Pro 630 $899. APS Technologies, 816/483-6100, 800/235-2752; fax 816/483-3077.

ClearVueColor 17 and 20T

The first of these two multiresolution color monitors is a 17-inch display that features a 0.26mm dot pitch and support for resolutions from 640 by 480 pixels to 1024 by 768 pixels at 90Hz to 100Hz. The second is a 20-inch Trinitron display that features a 0.31mm aperture pitch and supports resolutions up to 1280 by 1024 pixels at 50Hz to 160Hz. Both monitors have digital controls and can remember up to 22 different settings. The monitors are also MPR II-compliant. 17, $1049; 20T, $1249. RasteOps, 408/562-4200, 800/729-2656; fax 408/562-4033.

ClearVueColor 20T

When you put one of these monitors on either end of the line, all that would be eavesdroppers can hear is DES-encrypted data. The CryptoCom V.32bis is a standard 14.4-Kbps data modem that supports all the standard error-correction and data-compression protocols, including MNP Class 10 for cellular communications. Additionally, if two CryptoComs are talking to each other, they will encrypt their transmissions. $899. Western DataCom, 216/835-1510, 800/262-3311; fax 216/835-9146.

DEClaser 5100

This 600-by-600dpi laser printer comes with 2MB of RAM (expandable to 66MB); it features simultaneously active AppleTalk, serial, and parallel ports, with active emulation switching. The printer supports PostScript Level 2 and HP PCL 5E. Several upgrade options are available, including a 1200-dpi-resolution board, a 128MB hard drive, and interface cards for connecting to Token Ring and Ethernet networks. Supporting Ethernet, DEClaser 5100. Talk, NetWare, LAT, or TCP/IP. $2199; 1200-dpi upgrade (requires MAC of printer memory) $299; 128MB internal hard drive $499; Multi-Protocol Token Ring Network Card $599. Digital Equipment Corp., 508/493-5111, 800-777-4343; fax 508/493-8780.

Duo RAM Upgrades

If your house were too small, you'd move into a larger one, so why not do the same for your Mac? This expansion chassis for Mac LC, LC II, LC III, and Performa computers provides four PDS slots, a 40-watt power supply, and an additional bay for a larger hard drive (up to about 1/2-inch drive mechanism). The Multi Max includes all this but puts an internal, tray-loading, double-speed, multisession Photo CD CD-ROM drive in the bay. The Multi Max also adds two internal amplified speakers. $229; Multi Max $799. DGR Technologies, 512/476-9855, 800/239-9748; fax 512/476-6399.

EasyNet

Who would have thought that you'd be buying Ethernet transceivers as cheaply as you bought LocalTalk transceivers a few years ago? The EasyNet connects plug into any Mac or device with a built-in Ethernet port and connect to either a 10BaseT or thin Ethernet network. Each box measures 2.25 inches by 1.5 inches by 0.75 inch and weighs about 2 ounces. $79. DataComm, 801/269-7200, 800/531-0600; fax 801/269-7363.

NuMedia 2

To make your thunderbolts and lightning load and more frightening, you could try this 7-inch NuBus card into your Macintosh. It is a USB polyphonic synthesizer with 3272 instrument sounds; 48 digital echo, reverb, and chorus algorithms; and 15 different drum kits with over 400 percussion sounds. The board supports General MIDI, Roland MT-32, and Kurzweil SuperOrchestral MIDI sound tables. $695. Morning Star Solutions, 508/692-0373; fax 508/692-6535.

MacWaveMaker

This 7-inch NuBus card into your Macintosh gives you a MIDI synthesizer that has stereo line-level outputs and MIDI-in and -out ports. The MacWaveMaker is a 32-voice polyphonic synthesizer with 3272 instrument sounds; 48 digital echo, reverb, and chorus algorithms; and 15 different drum kits with over 400 percussion sounds. The board supports General MIDI, Roland MT-32, and Kurzweil SuperOrchestral MIDI sound tables. $695. Morning Star Solutions, 508/692-0373; fax 508/692-6535.

Magic RAID

These dual-drive arrays come in 1GB, 1.4GB, 2GB, and 3.4GB sizes, and are populated with Quantum and Seagate mechanisms. All the arrays have average access times of 4ms and sustained data-transfer rates of 8MBps, except for the 3.4GB model, which can reach 37ms and 10MBps. All the arrays support RAID levels 0, 1, 4, and 5. 1.4GB $1889; 1.4GB $2399; 2GB $2699; 3.4GB $4338. Mac Products, 512/472-8881; fax 512/499-0899.

NPS 350

Small enough to fit in your hand (almost), this print server connects nearly any printer with a serial port to a 10BaseT network. The NPS 350 supports NetWare, LAN Manager, LAN Server, TCP/IP, and EtherTalk. $599; without TCP/IP $499. Axis Communications, 508/777-7957; fax 508/777-9905.
Device Expansion

Pocket EtherTalk Adapter
You never know when you're going to need to network, but with Xircom's adapter, all you need to plug in an EtherTalk net is a SCSI port and the appropriate software. The Pocket EtherTalk Adapter features both DB-25 and HD-32 ports, which make it appropriate for PowerBooks or for providing a pass-through SCSI port for daisy-chaining other devices. The adapter draws power from the host Mac's ADB port. PET-108T (10BaseT only) $349; PET-108C (10BaseT and thin Ethernet) $399. Xircom, 818/878-7660; fax 818/878-7630.

New Products

Power Poker
A poker-playing and tutorial program, Power Poker includes 77 poker variations, and players can design their own. Built-in artificial intelligence learns your playing patterns, and the software features hand analysis, displays of historical hand strengths, and performance charts. Also, up to ten human players can play each other via LocalTalk or Ethernet. $49.95. Electronic Arts, 415/571-7171; fax 415/570-5137.

Power RAID Storage System
Put scads of data at your fingertips with these two-drive SCSI arrays. The Power RAID Storage System features 32MB of buffer memory, 7-inch NuBus, SCSI-2 Fast and Wide cards are included with the array. To turn these devices into RAID systems, you have to purchase additional software. The PRSS Lite software supports RAID levels 0 and 1, and the PRSS Full software supports RAID levels 0, 1, 4, and 5. 1GB $1709; 1.4GB $2399; 2GB $2699; 3.4GB $4148; PRSS Lite $190; PRSS Full $365. DGR Technologies, 512/476-9895, 800/235-9748; fax 512/476-6399.

PowerRAI Presenter 575
This output adapter plugs directly into the motherboard of the Macintosh LC 575 or the corresponding Performa model. It provides D-15 (Macintosh) and HD-15 (VGA) connectors for color or monochrome LCD panels, external monitors, and projectors. A version that supports the Mac LC 520 and LC 550 is available as well. $129. PowerR, 206/434-3010, 800/227-9775; fax 408/272-2795.

PrecisionColor Display/21
There's something undeniably large about a 21-inch display, something that makes previously ordinary file icons seem tiny. This 21-inch multiresolution color monitor features a 0.28mm dot pitch, a maximum resolution of 1360 by 1024 pixels at 71Hz, and digital controls. Radius's Dynamic Desktop software, which allows instant resolution and bit-depth switching without restart, is included. $2499. Radius, 408/434-1010, 800/227-2795; fax 800/966-7360.

QuickSCSI-F
Why settle for data that crawls in through your built-in SCSI port at a measly 400KBps per second when you can throw wide the gates to an information torrent? The QuickSCSI-F is a 7-inch NuBus SCSI-2 card that supports data-transfer rates up to 10MBps. Macs with the card installed can boot from drives connected to it, and the QuickSCSI-F supports disk mirroring for instant back-up. $699. P1. 510/657-2211, 800/288-8754; fax 510/683-9713.

SlimWriter
At 12 inches by 8.5 inches by 1 inch, and 2.6 pounds (with battery), this 360-by-360-dpi thermal printer could neatly fit into one of the side pockets of your PowerBook case. The SlimWriter prints on plain paper, thermal bond paper, envelopes, and transparencies, all up to 8 inches wide. The printer works off a standard camcorder battery, which provides 50 minutes of operation (30 to 50 pages); high-capacity batteries are also available. The unit comes with an AC adapter. The required Macintosh adapter package includes a serial cable and driver software. The manufacturer estimates that the SlimWriter can print about 5 to 15 pages per minute. $399; Mac Pack 560, Atlantic Technologies, 910/350-0700, 800/779-7705; fax 910/392-7093.

RAM Doubler
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Sales of more than 6 million cartridges and 1 million drives have made SyQuest the world standard in removable storage.
**New Products**

**Sound Advantage Hardware**
If you want to work with sound, but your Mac doesn't have built-in sound input, this device connects to your Mac's serial port and provides a built-in microphone and two input jacks for an external microphone and a line-level source such as a CD player. The Sound Advantage Hardware also features a sliding volume control and a pass-through serial port. The device's maximum sample rate is 22kHz. The hardware ships with a software driver, which also provides voice-activated recording. Built-In Mic Options software, sold separately, works with Macs that have a built-in sound-input port, provides voice-activated recording, and controls digitization quality by tweaking the sample rate and the compression ratio. Requires System 6.0.7. $160; Built-In Mic Options $88. Heart Computer, 214/771-7511; no fax.

**SuperMatch 21T XL**
A 21-inch multiple-resolution color monitor, the 21T XL features a Mitsubishi aperture grille tube (0.31 mm aperture pitch) and can display resolutions up to 1600 by 1200 pixels. The monitor has digital controls (including a three-way adjustable white point) and a microprocessor that remembers the settings for each viewing mode. This display complies with both the MPR II emissions guidelines and the Energy Star guidelines. $2599. SuperMac Technology, 408/541-6100, 800/334-3005; fax 408/785-7250.

**TV Elite for Macs**
With this external video converter, you can put your Mac's 640-by-480-pixel-resolution video on a television. The box has both composite video and S-Video outputs, as well as an RGB monitor output, so your video appears on your television and monitor simultaneously. $399. Advanced Digital Systems, 310/926-1928, 800/888-5244; fax 310/926-0518.

**Viking Duo RAM Upgrades**
Having a PowerBook Duo is cool, but running out of memory is not. These RAM upgrades come in 4MB, 8MB, 12MB, and 20MB sizes and fit in any of the Duos, from the 210 to the 270c. You can also install the 20MB card and then piggyback an 8MB daughtercard on top of it to put a total of 32MB in your sleek gray road machine. 4MB $279; 8MB $529; 12MB $979; 20MB $1575; 8MB daughtercard $500; 28MB combo $2375. Viking Components, 714/643-7255, 800/338-2361; fax 714/643-7250.

**XTG 6 X 8**
Instead of scanning your paper drawings, you can skip the middle machine and sketch your ideas directly into your Mac with this graphics tablet. The XTG 6 X 8 has a 6-by-8-inch active area (1270-Li resolution) on an 8.5-by-11-inch frame. The pad plugs into the AD8 port and comes with a cordless, pressure-sensitive pen (256 levels). Driver software is included. $399. Kurta Corp., 602/276-9007.

**BLAST Professional for Macintosh**
This cross-platform telecommunications software relies on a proprietary transmission protocol to send your files up to two times faster than Xmodem. To realize that speed increase, your Mac must be talking to another machine that is also running the BLAST software; but BLAST Professional does support the more common Xmodem, Ymodem, and Zmodem protocols. The software also can perform terminal emulation (Wyre 50, VT52, VT100, VT220, and TTY), and it has a scripting language for automating tasks. $139. BLAST, 919/542-3007, 800/242-5278; fax 919/542-0161.

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New Products

The control panel also now includes a caching feature that improves drive performance. $79.95. Casa Blanca Works, 415/461-2227; fax 415/461-2249.

Fourth Power Service 2.0
This 4th Dimension-based accounting software is designed for service-oriented companies and can handle job records, estimating, and quoting; proposal production; time tracking and billing; and forms creation. Fourth Power Service can automatically create everything from estimating, and quoting; proposal production; time tracking and billing; and forms creation. Fourth Power Service can also play notes as you type, acting as if your computer keyboard were a piano keyboard. 2.5MB min. memory; requires Mac Classic. $149. Passport Designs, 415/726-0280, 800/443-3210; fax 415/726-2254.

PortfolioMaker
If you're an artist, sending out slide portfolios to all and sundry can be an expensive proposition. But if you can scan or otherwise digitize your work, this software generates required reports, including images onto a single high-density floppy disk that you can duplicate and send out. You decide in what order to display the images, and you can optionally add text comments. The recipient can browse through the images and the text, but cannot make any changes. Image size is approximately 3 by 5 inches (256 by 384 pixels). 4MB min. memory; requires System 7, color. $129. CRIT, 605/886-4180, 800/222-4266; fax 605/886-4180.

MusicTime
If you're musically inclined, this software can help your Mac be that way also. If you have a MIDI instrument, MusicTime can record your performance and create sheet music that you can edit and print out. Alternately, you can compose by hand, with up to eight staves per system and up to four voices per staff. The software can also play notes as you type, acting as if your computer keyboard were a piano keyboard. 2.5MB min. memory; requires Mac Classic. $149. Passport Designs, 415/726-0280, 800/443-3210; fax 415/726-2254.

RRKeyFonts/Mac
Trying to describe a keyboard shortcut can be an exercise in frustration (or at least in long, hyphenated phrases). This font pack consists of RRMacCaps, depicting keys like %, option, return, and control; RRKeyLetters, showing the alphabet, numbers, and punctuation surrounded by keylike boxes; and RRRWin-Symbols, depicting common Windows symbols and cursors. The package ships with both TrueType and PostScript Type 1 versions of the fonts. $49. RoadRunner Computing, 504/346-0019; fax 504/346-8144.

Word for Word—Macintosh 6.0
If you frequently need to translate files in a variety of different formats, you might consider the latest version of this document-conversion software. Word for Word reads and writes nearly 150 text, database, and graphics standards, including most common PC and Mac formats. If you have System 7, the software works with Apple's Easy Open extension, and you can convert documents by dragging and dropping them on the program icon. $149. Mastersoft, 602/948-4888, 800/624-6107; fax 602/948-8261.

XPreview
Preview your Quark documents without firing up the program. This software displays the document's vital statistics, including the colors, fonts, and imported graphics used, along with miniatures of each page of a file saved using the included Preview Editor XTension. XPreview can have several documents open at once, and users can print out information about each document. Requires System 7. $79. Vision's Edge, 408/748-8411, 800/800-8476; fax 408/748-9584.

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The PowerBook 500 Series. In brief.
Welcome to the next generation of PowerBook:
Four new Apple PowerBook computers that redefine, once again, what a notebook computer can be.

One look tells you these are very new indeed. The flowing shape. The sleek lines. The futuristic curves.

But the new appearance is only your first clue to the dramatic changes, refinements and improvements we've engineered inside.

**More power.** The PowerBook 500 series is designed around the Motorola 68LC040 processor—a chip that offers far more power than the chips that powered previous PowerBook models.

In benchmark tests, the new PowerBook 540c running at 66/33 MHz was 80% faster than the fastest previous PowerBook. (Its gray-scale counterpart, the 540, is equally fast.) And with the same chip running at 50/25 MHz, the 520 and 520c aren't far behind.

We've supported that processing power with 80% more memory capacity (up to 36MB), 56% more internal storage capacity (up to 320MB) and built-in high-performance Ethernet networking (as well as LocalTalk*).

This makes the PowerBook 500 series powerful enough not only for word-processing long documents or Fortune 500-sized spreadsheets, but also for doing fieldwork with programs like Adobe Photoshop and other high-end, graphics-intensive programs.

Add SoftWindows software from Insignia Solutions Inc., and you've got the ability to run MS-DOS programs as well.

The 500 series offers the possibility of even more power later, because you can upgrade to PowerPC technology when it's available for PowerBook. (Contrast this with 486 notebooks that aren't upgradable to Pentium technology.)

**More precision.** Kindly direct your attention to the revolutionary new Apple trackpad pointing device that replaces the trackball and is centered on the comfortable palm rest.

The trackpad's ultrasensitive surface senses the touch of your finger, tracks it across the pad and moves the cursor across the screen accordingly.

This intuitive method of moving the cursor, combined with the new dual-scan and active-matrix screens, gives you much more precise control over the location of the cursor and makes extremely detailed work
possible (it's actually precise enough for photo retouching) wherever you happen to be.

The PowerBook 540c has what may well be the finest screen ever to grace a notebook computer: an active-matrix, 95-inch display capable of showing thousands of colors at the same time. Combined with QuickTime video and built-in stereo sound, these screens make for truly spectacular presentations in the most unspectacular locations: on a crowded plane, in a noisy diner, wherever.

More expandability. The new PowerBook 500 series includes a lot of things that aren't standard on ordinary notebook computers.

Things like built-in file sharing and networking. Stereo sound and video-out. Macintosh PC Exchange software, eWorld and PowerBook File Assistant file-synchronizing software. And we've even included Apple Remote Access software that allows any modem-equipped PowerBook to work with the Macintosh computer on your desk, and with your network, as if you were sitting in your office. Even during those times when your office happens to be thousands of miles away.

Still, there's a lot of room to grow. These are the first PowerBook computers to come with a built-in Processor Direct Slot (PDS) for third-party expansion modules. And they're also the first ones to offer the optional plug-in PowerBook PCMCIA Expansion Module, so you can use two Type II or one Type III PCMCIA card for even more flexibility.

You can even install an optional 19,200-baud internal modem to send and receive information quickly, and when it becomes available, a third-party cellular interface for convenient wireless access to your office network.

More battery life. Even the batteries have been thoughtfully redesigned. The PowerBook 500 series can use two PowerBook Intelligent Batteries. These high-powered NiMH batteries use special processors within each pack to monitor battery power and the new PowerBook Control Strip — power management software that tells you exactly how much time you have before you need to recharge the batteries.

The result is 40% more battery life than before — up to seven hours per charge — when using both batteries.

They recharge faster, too — in as little as two hours for both batteries when the PowerBook is asleep or shut down. And the batteries even recharge while you're using the PowerBook.

More information. While this has been an abundance of information, by any standard, it can't serve as a substitute for a personal demonstration. Something that can be easily arranged at your authorized Apple reseller. To find the one nearest you, simply call 800-732-3131, ext. 100. (In Canada, call 800-665-2775, ext. 910.)

And soon discover more of the power you buy a PowerBook for. The power to be your best.

Introducing the PowerBook 500 Series. The next generation of PowerBook.
Power Macintosh 7100/66

**Macintosh Computer**

**PROS:** Three expansion slots; fast CPU.

**CONS:** Awkward video implementation.

**COMPANY:** Apple Computer (408/996-1010).

**COMPANY'S SUGGESTED PRICE:** Base model $2899.

QUADRA, MOVE OVER. THE Power Mac 7100/66 is poised to be the next standard business Macintosh desktop model. The Centris and Quadra 650 have become the business Macs of choice because they combine power and expandability—and the Power Mac 7100, which looks like a Quadra 650, should assume the same role.

Based on my experiences with early native-PowerPC software, I expect the ultimate performance of the 66MHz 7100—with all native programs—to be about two to three times that of a Quadra 650 (see “Native Power Mac Software Performance”).

**Ever-Changing Performance**

The Power Mac 7100, running 680X0 programs in emulation, is about as fast as a IIx, according to Macworld Lab tests. Our standard tests use programs that were available only in 680X0 versions at test time. Aldus FreeHand and PageMaker and Specular International Infini-D later shipped in native mode; QuarkXPress is expected by July. The three other programs in our test suite are on the slow track to native versions: Microsoft Excel and Word (slated for August releases) and Claris FileMaker Pro (no firm date).

As the applications you use begin to ship in native versions, you’ll see some of the promised two-to-four-times-a-Quadra-650 speeds. Till then, the chief advantage of a Power Mac is bragging rights. Still, the reasons to delay buying a Power Mac are beginning to evaporate.

**Weird Video**

The Power Macs are the first Apple computers with two video ports built in. One, on the back panel, uses an AV-style connector and system RAM to carry the video signal (like the IIfc). The other is on the bundled PDS-based video card (or an AV Power Mac, there’s an AV card in the PDS slot that also offers a video port). The PDS video card uses a standard Mac video connector and video RAM (VRAM) to carry the video signal.

Is there an advantage to using one video port over the other? Sometimes. The performance of the back-panel video connector and the PDS card are about the same—about equal to a Quadra 700’s internal video, but the PDS card’s video supports larger monitors at higher resolutions: up to 16-bit on a 19-inch monitor and up to 24-bit on a 16-inch monitor, if you have 2MB of VRAM on the card. (For PDS cards with 1MB of VRAM, or for AV cards with the TV-video ports in use, the Power Mac 7100 supports 8-bit color on a 19-inch monitor, 16-bit color on a 16-inch monitor, and 24-bit color on a 14-inch monitor.)

The speed of the Power Mac’s video, while less than that of a Centris or Quadra 650, is fine for most users. Apple has clearly decided that fast video should be an integral part of a system and not an add-on. If you need very fast video, you’ll want to get a NuBus-based video accelerator anyhow. (And then you can connect three monitors to your Power Mac!)
It's convenient to have two monitor connectors, but Apple's implementation is strange. Most people don't have AV monitors, so they must plug their monitors into the PDS card or buy an adapter cable to use the back-panel port. And for the AV cards, why not an AV video connector instead of the standard video connector? (From an engineering standpoint, it was easier to put the AV connector in the back; the motherboard there includes circuits for ADB and sound, whose control chips are nearby.)

Apple also says the Power Macs support VGA and Super VGA multimode monitors—the PC standards—via the PDS card video. That's true only with the VGA adapter for a Centris or Quadra whose control chips are nearby. (From an engineering standpoint, it was easier to put the AV connector in the back; the motherboard there includes circuits for ADB and sound, whose control chips are nearby.)

Apple also says the Power Macs support VGA and Super VGA multimode monitors—the PC standards—via the PDS card video. That's true only with the right video adapter. Note that a Mac-to-VGA adapter for a Centris or Quadra may not work as you'd expect on a Power Mac. The Power Macs now support multiresolution displays (including Apple's latest models), so you can change the pixel resolution from, say, 832 by 624 to 1024 by 768 to view a large image—without restarting. VGA monitors have done that for years, although a restart is required. But the Power Mac won't know that a VGA monitor is multiresolution unless the adapter tells the Power Mac so. Ask your monitor maker for a new adapter; companies like NEC Technologies offer them for free (312/622-7427).

Both of my video concerns are minor issues—neither affects the vast majority of users, and neither lacks a solution for the users who are affected.

With Apple's new strategy of developing Mac platforms that several models can be based on—the Centris 650, Quadra 650, Quadra 800, and Quadra 840AV all have the same basic motherboard design, while the IIsi, Centris 650, Quadra 650, and Power Mac 7100 all have the same case—it's not surprising that the 7100 looks like its 680-based counterparts. There's not much to say about its hardware—the 7100 has the standard devices and ports.

Apple did make built-in Ethernet connectors (for which you need a transceiver) standard for all Power Macs, and 8MB of RAM is now a standard on-board configuration. You'll probably need that RAM, since early indications are that Power Mac software uses more RAM than 680X0 software. Power Mac software also typically takes more disk space, so make sure you get a big hard drive—consider 250MB at a minimum, with 500MB or more realistic amount.

The 7100 has one option you should strongly consider adding: a cache card. This boosts performance by about 15 percent for standard programs and by as much as 45 percent for programs that use a lot of floating-point math, such as modeling and scientific-analysis software.

The use of the PDS for the video or AV card also means this slot cannot be used for expansion devices, except for third-party video cards (which no one has yet indicated interest in developing).

A Great Mac

The Power Mac 7100/66 is the Mac I'd like to have—once the native software I use is available, of course. If you have the money—figure $4000 for a model with a 500MB drive, 256K cache card, 16MB of RAM, keyboard, and monitor, but no CD-ROM drive—the 7100 makes an outstanding workstation whose power should last you for several years, even with the inevitably faster Macs based on faster PowerPC 601 and PowerPC 604 CPUs that are likely to ship next year. A $4000 price is nothing to take lightly, but the Power Mac 7100 delivers every dollar's worth.—GALEN GRUMAN

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### Native Power Mac Software Performance

For these tests we used shipping versions of the Power Mac 7100/66 and 7100/80 (each with a total cache of 512K) and shipping versions of native Power Mac software. For each program, we tested several typical tasks. The results are strong examples of native Power Mac software's speed versus the speed of 680X0 software.

<table>
<thead>
<tr>
<th>Program</th>
<th>Power Mac 7100/66</th>
<th>Power Mac 7100/80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Photoshop 2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change mode to CMYK</td>
<td>3.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Gaussian blur</td>
<td>2.4</td>
<td>1.8</td>
</tr>
<tr>
<td>Unsharp mask</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Aldus FreeHand 4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnify</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Print PostScript</td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Fractal Design Painter 2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjust dye concentration</td>
<td>3.4</td>
<td>3.2</td>
</tr>
<tr>
<td>Apply surface texture</td>
<td>1.5</td>
<td>1.4</td>
</tr>
<tr>
<td>AutoClone</td>
<td>3.2</td>
<td>3.0</td>
</tr>
<tr>
<td>Specular Infini·D 3.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Render</td>
<td>2.1</td>
<td>1.9</td>
</tr>
</tbody>
</table>

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### Power Macintosh 7100/66: How Fast Is It?

**Core-Performance Index**

<table>
<thead>
<tr>
<th>Product</th>
<th>Times as fast as a Classic (Classic = 1.0).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Mac 7100/66</td>
<td>1.6</td>
</tr>
<tr>
<td>Power Mac 7100/80</td>
<td>1.4</td>
</tr>
<tr>
<td>Power Mac 6100/60</td>
<td>1.2</td>
</tr>
<tr>
<td>Centris 650</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Business-System Performance Times**

<table>
<thead>
<tr>
<th>Processor</th>
<th>Several tasks in Adobe Photoshop, Aldus FreeHand, Claris FileMaker Pro, and Microsoft Excel and Word.</th>
</tr>
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<tbody>
<tr>
<td>Drive Access</td>
<td>File opens in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.</td>
</tr>
<tr>
<td>Video Display</td>
<td>Horizontal and vertical scrolling in Microsoft Excel and Word, and QuarkXPress.</td>
</tr>
<tr>
<td>Floating Point</td>
<td>Scientific recalculations (which use floating-point math) in Microsoft Excel.</td>
</tr>
</tbody>
</table>

**Times are in seconds. Shorter bars are better.**

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*With optional 256K cache. **Using 680X0 programs.
**Power Macintosh 8100/80**

**Macintosh Computer**

**PROS:** Fast 80MHz CPU; tower case with three expansion slots and room for two 1GB hard drives. **CONS:** Expensive compared with other Power Macs. **COMPANY:** Apple Computer (408/996-1010). **COMPANY'S SUGGESTED PRICE:** $4249.

**RUNNING AT 80MHz**, twice the clock speed of machines using Apple's 68040 CPUs, the Power Mac 8100 is ideal for publishers and designers who must squeeze every drop of performance from their computers. But of course there's a hitch: to get that speed, you need applications written in code native to the PowerPC chip.

The 8100 runs 680X0 applications at the speed you might expect from a Quadra 610, according to Macworld Lab tests. So if you now use a fast Quadra, you might want to wait until the software you need is in a stable native version (see "Native Power Mac Software Performance" in the Power Mac 7100 review).

Recognizing that LocalTalk is too slow for professional users and that many Macs must coexist with DOS machines, Apple has made Ethernet standard on all Power Macs and has bundled Macintosh PC Exchange with the Power Mac version of System 7.

Like all Power Macs, the 8100 can support two monitors simultaneously. The first option, an AV-style monitor port on the Power Mac's back panel, uses DRAM to give you 8-bit color on 16-inch monitors and 16-bit color on 14-inch displays. The second option is a PDS-based video card that uses VRAM installed directly on the card. The 8100 offers 2MB of VRAM in standard configurations, and it supports 16-bit color on 21-inch displays and 24-bit on 14-inch and 16-inch displays. If you upgrade the VRAM to 4MB (about $200), you'll get 24-bit color on monitors with up to 21-inch displays.

The 8100 also supports multiresolution displays, but only if they identify themselves to the Power Mac as multi-resolution models. You may need a video cable adapter for a third-party monitor.

**The 8100/80AV**

The AV option lets users add video input and output. The AV card replaces the standard video card in the 8100's PDS slot and adds three ports: one for a second monitor and two for S-Video.

While the 8100's speed does improve AV performance, there still isn't much new AV technology available for Power Macs. Until AV software catches up with PowerPC technology, the AV Power Macs don't live up to Apple's promised telephony and voice-recognition features.

**Expanding the 8100**

Most users will add more options to the powerful base design. Users of QuickTime or 3-D rendering applications, for example, need lots of storage space. In addition to the 3/4-inch, third-height hard drive and 3/4-inch floppy drive included with the base model, the tower case has room for another full-height 3/4-inch drive (or two half-height drives) and a 3/4-inch removable-media bay for a CD-ROM player or SyQuest drive. To access the extra drives quickly, the 8100 features a dual-channel SCSI interface; the internal SCSI channel supports data transfers at up to 10 Mbps, and the external channel supports up to six other SCSI devices that don't require such high-speed transfers. The high-speed channel even supports an internal disk array.

The 8100 is fast and will only get faster as software goes native and developers take better advantage of the PowerPC chip's power. And if you want to add multimedia, the 8100 offers top-of-the-line speed and expandability. But this Power Mac is expensive when compared with its DOS equivalents, or even with the Power Macintosh 7100: the more than $1000 price difference buys you essentially an extra 20MHz of speed, a dual SCSI port, and a tower case.

While it doesn't quite offer the excellent price/performance ratio of the other two Power Macs, you should consider the 8100 if you're a high-end user moving your work over to RISC-based computing. —Matthew Hawn and Danny Lee

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**Power Macintosh 8100/80: How Fast Is It?**

<table>
<thead>
<tr>
<th><strong>CORE-PERFORMANCE INDEX</strong></th>
<th><strong>BUSINESS-SYSTEM PERFORMANCE TIMES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Times as fast as a Classic (Classic = 1.0).</strong></td>
<td><strong>Times in seconds. Shorter bars are better.</strong></td>
</tr>
<tr>
<td><strong>Use these standard ratings of overall performance, based on a core test suite, to compare systems across classes.</strong></td>
<td><strong>Use these results to compare the performance of systems for different types of real-world tasks within each class. For each type of system, results can be compared with other Macworld Business-System Performance Times.</strong></td>
</tr>
<tr>
<td><strong>Common</strong></td>
<td><strong>Processor</strong></td>
</tr>
<tr>
<td>Typical business tasks in Microsoft Excel and Word that use the Mac's processor, drives, and video display.</td>
<td>Several tasks in Adobe Photoshop, Adobe FreeHand, and QuarkXPress.</td>
</tr>
<tr>
<td><strong>Scientific</strong></td>
<td><strong>Drive Access</strong></td>
</tr>
<tr>
<td>We added to the common tasks several scientific calculations (which use floating-point math).</td>
<td>Filenames in Adobe Photoshop and disk-based sorts in Claris FileMaker Pro.</td>
</tr>
<tr>
<td><strong>Video Display</strong></td>
<td><strong>Floating Point</strong></td>
</tr>
<tr>
<td>Horizontal and vertical scrolling in Microsoft Excel and Word.</td>
<td>Scientific recalculations (which use floating-point math) in Microsoft Excel.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power Mac 8100/80</strong></th>
<th><strong>8100</strong></th>
<th><strong>80</strong></th>
<th><strong>256</strong></th>
<th><strong>57</strong></th>
<th><strong>66</strong></th>
<th><strong>187</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Mac 6100/60</strong></td>
<td><strong>60</strong></td>
<td><strong>29.3</strong></td>
<td><strong>300</strong></td>
<td><strong>60</strong></td>
<td><strong>116</strong></td>
<td><strong>377</strong></td>
</tr>
<tr>
<td><strong>Quadra 840AV</strong></td>
<td><strong>165</strong></td>
<td><strong>28.3</strong></td>
<td><strong>116</strong></td>
<td><strong>60</strong></td>
<td><strong>49</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>Centris 650</strong></td>
<td><strong>12.8</strong></td>
<td><strong>21.8</strong></td>
<td><strong>162</strong></td>
<td><strong>65</strong></td>
<td><strong>24</strong></td>
<td>****</td>
</tr>
</tbody>
</table>

*Using 680X00 programs.*
Newton MessagePad 110

Personal Digital Assistant

**PROS:** Better handwriting recognition and more RAM than original MessagePad; improved battery life; improved case design. **CONS:** Handwriting software still frustrating; lack of business software. **COMPANY:** Apple Computer (408/996-1010) **COMPANY'S SUGGESTED PRICE:** $999; ROM upgrade for original MessagePad $99.

With the original MessagePad, if you don't have handwriting recognition turned on, your notes are saved as digital ink and are destined to remain digital ink until they are deleted; you can't go back and convert the notes into ASCII text. With the 110, you simply select the digital ink you want to recognize (by holding down the pen and dragging across the text). Then, when you double-tap on the highlighted text, the MessagePad attempts to recognize your handwriting.

If you use your MessagePad to take notes during meetings, you'll appreciate deferred handwriting recognition—it can be distracting to watch the MessagePad try to recognize your handwriting as you concentrate on what you're writing.

The other major improvement is the 110's handwriting-recognition capabilities is letter-by-letter recognition. In the original MessagePad, recognition is strictly word-based. That is, the MessagePad attempts to recognize words by matching them to entries in your word list. While this method is fast and generally reliable, the addition of letter-by-letter recognition is great for proper nouns that most likely are not in the word list. If the MessagePad 110 butchers a word, tapping on that word brings up a list of possible alternatives and offers you the option of letter-by-letter recognition. If you write legibly, letter-by-letter recognition works well. For example, the 110 recognized *Macworld* as *MacLeod*; however, when I switched to letter-by-letter recognition, the 110 got it right. Or if you know that you are about to write a series of names that aren't in the word list, you can turn on letter-by-letter recognition. Also, after you use letter-by-letter recognition to identify a word, you can add it to the word list.

If you own the original MessagePad, you can get the improved handwriting-recognition capabilities by upgrading to the new ROM ($99). In addition to the 110, Apple sells the MessagePad 100 ($499), which uses the same case design as the original. The 100 has the same ROM as the 110, so you get the improved handwriting-recognition features.

In addition to new ROMs, the 110 has 1MB of RAM, which is a big plus because the Newton uses its RAM for active memory as well as storage. Of the original MessagePad's 640K of RAM (the MessagePad 100 also will have only 640K), only about 140K is available as work space. The 110 offers about 520K for work space, which reduces the need to buy a RAM expansion PCMCIA card.

The MessagePad 110 also has longer battery life, thanks to four AA alkaline batteries or a rechargeable NiCad battery. During my use I never received a low-battery message.

**Make the Connection**

Apple has also released version 2.0 of Newton Connection Kit ($99). This new version has filters for WordPerfect 3.0, Word 4.0 and 5.0, ACT 1.1, Dynodex, Address Book Plus, DateBook Pro, Now Up-to-Date, and others. If you can't picture yourself entering and reentering hundreds of names, addresses, phone numbers, and calendar events using the Newton's handwriting recognition, you'll appreciate the connection kit.

The MessagePad 110's beaming capabilities provide an easy way to exchange data with other MessagePads and infrared devices. And the 110's infrared transceiver now supports transmission speeds of up to 38.4 Kbps. It's true that you don't see a lot of people running around beaming stuff to Newton MessagePads nowadays. However, if Apple decides to add infrared transceivers to Macs and printers, the MessagePad's faster infrared-transmission capability will become much more relevant.

**Has the Newton Come of Age?**

The MessagePad 110 is the Newton that Apple should have shipped last August, so in many ways it simply brings Newton technology to where you'd expect it to be. Still, Apple deserves praise for recognizing the Newton's shortcomings and acting quickly to correct them. Using the MessagePad 110 was a pleasant experience. Now all I need is a reason to use it.

—DAN MUSE

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**OrangePC Model 200 Series**

**PC Coprocessor Cards**

**PROS:** Fast; works in most Power Macs and 680X0 Macs; can be networked; allows expansion.

**CONS:** Expensive; not as fast as CPUs' rated speeds.

**COMPANY:** Orange Micro (714/779-2772).

**COMPANY'S SUGGESTED PRICE:** $1139 to $3237, depending on model and configuration.

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**Orange Micro Comparison**

<table>
<thead>
<tr>
<th>Spice</th>
<th>Performance Index</th>
<th>Windows Performance Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>66MHz 486DX2 (Gateway 2000 40CD-66V)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>66MHz 486DX2 GATEWAY 2600</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>66MHz 486DX2 GATEWAY 2600</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>66MHz 486DX2 (68600/400)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>66MHz 486DX2 (Tandy 3100 Model 10)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>66MHz 486DX2 (Tandy 3100 Model 10)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Tandberg Pro 1.3 (33MHz 486DX3)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Apple DOS Compatible Card (25MHz 486SX)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>SoftWindows 1.0 (Power Mac 7100/66)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>SoftWindows 1.0 (Power Mac 7100/70)</strong></td>
<td>22.0</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>SoftWindows 1.0 (Power Mac 6010/60)</strong></td>
<td>22.0</td>
<td>6.0</td>
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</tr>
</tbody>
</table>

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**WHY'S THE BEST WAY TO RUN WINDOWS FROM YOUR MACINTOSH? (ASSUMING YOU ARE SO INCLINED?)**

Today, you have several choices, including Parallon Computing's Timbuktu Pro for controlling a PC remotely (see Reviews, May 1994), Apple-endorsed SoftWindows from Insignia Solutions (see the review in this issue), and Orange Micro's OrangePC cards.

The new Model 200 series revamps the Orange Micro line so that all the cards use one of the 80486 CPUs that are the backbone of business PCs today.

There are three basic cards in the OrangePC lineup: the Model 210, which comes with 4MB of RAM, a serial port, a parallel port, and standard VGA video (16-color, 640-by-480-pixel resolution); the Model 250, which comes with 8MB of RAM, a PCMCIA slot, and Super VGA video (256 colors at up to 800-by-600-pixel resolution); and the Model 290, which is essentially a Model 250 with 16MB of RAM and a cable that adds a serial and parallel port.

The PCMCIA slot lets you insert drives, SCSI adapters, and network cards, while the serial and parallel ports enable you to connect to fax modems, input devices, and printers.

All three models work in any Mac that can take 12-inch NuBus cards: that's all Macs except the IIsi, Centris 610, Quadra 605 and 610, Centris and Quadra 660AV, and Power Mac 6100. The OrangePC software works on the Power Mac 7100 and 8100 and on 680X0 Macs.

The OrangePC software lets you share volumes (folders or disks) between the PC and the Mac. If you use Apple's Macintosh PC Exchange 2.0, you can even share a PC SCSI disk that is connected to your Mac's SCSI port, although disk access slows considerably. If you want speedy disk access to an external drive, get a PCMCIA-based drive or SCSI adapter.

With the OrangePC, you can give your Mac a faster CPU for Windows work, so it's easy to put together the performance and features you want.

But the combination of expansion and speed is expensive. OrangePCs cost from $1139 to $2977, depending on model: $1139 to $2327 for the lowest-end Model 210 (which uses a 33MHz 486SX) to $3237 for the highest-end Model 290 (which uses a 100MHz Intel DX4). That's about 30 percent more than it costs to buy an equivalent Windows PC—monitor, keyboard, drive, the whole works.

You might attempt to justify the cost based on the fast speed of the 486 CPUs that the OrangePC cards use. But the speed you get does not match the rated speed of the CPU. For example, an OrangePC card using a 33MHz 486SX performs more like a PC using a 25MHz 486SX, while an OrangePC card using a 66MHz 486DX2 performs more like a PC using a 33MHz 486DX. The slowdown is due to the overhead of managing the PC card.

Still, the OrangePC cards are faster than any other Windows Mac option, as shown in Macworld Lab tests. If your goal is to get a Macintosh that runs Windows as fast as a PC, you can't get there from here. If your goal is to get business-level performance for day-in, day-out use, you can.

And although the price for the processor cards is steep, it's not out of line. In fact, if you compare the total cost of a Power Macintosh 7100/66 with a 33MHz 486SX-based OrangePC Model 210 card and Windows (it's not included with the card) against that of a Power Mac 7100/66 with SoftWindows and the extra RAM and cache, it's a difference of only $375. That's not much, considering the much better performance of the Model 210. But for faster OrangePC cards, the price difference starts to loom large, and you have to ask yourself whether you're buying too much power.

—Galen Gruman

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—Galen Gruman
NSIGNIA HAS A TOUGH CHALLENGE: to deliver Windows on a Mac completely via software. The Power Macs are here, and so is SoftWindows—with a strong endorsement by Apple. Does SoftWindows solve the speed problem? No, although performance is now acceptable for low-end business needs. More important, is SoftWindows a long-term solution to Windows compatibility? Perhaps, but there's no guarantee that it can keep up with forthcoming releases of Windows or new Microsoft technology.

SoftWindows delivers its main promise: you can run Windows programs on a Mac, in a Windows window. Insignia has a license from Microsoft to use the Windows 3.1 code, and sure enough, you get real Windows. But there are prices to pay for the ability to run Windows via emulation.

One price is the performance. While SoftWindows runs at four to six times the speed of Insignia's SoftPC, that's still at the level of bottom-end Windows machines, ranging from a fast (33MHz) 80386DX (approximately equivalent to the performance of a Mac IIfs) to a slow (25MHz) 80486 (approximately equivalent to a Centris 610). SoftWindows' performance varies by application. This performance is fine for standard programs used occasionally, such as accounting packages and databases.

A second price is compatibility. Yes, SoftWindows contains real Windows code, but it runs only in Standard mode. That means it acts like it's working on an 80286-based PC (such as IBM's long-discontinued AT). The 286 has been dead for several years, and even the 386 has been basically out of the business picture for more than a year. Now that Pentiums are starting to overtake the 486, Windows software developers are dropping support for the 286 and requiring a 386 or better CPU. By targeting users who have 386, 486, or Pentium PCs, software developers can take advantage of Windows' Enhanced mode and its better memory-handling, multiple-program-interaction, and protected-services features.

But Enhanced-mode programs won't work under SoftWindows. System-level services like OLE 2.0 (the Windows equivalent of the forthcoming OpenDoc, or Apple's publish and subscribe) require Enhanced mode—even if you don't need to run OLE 2.0 within your SoftWindows session, you may well want to use OLE to connect a program running in SoftWindows with a program running on a real PC on the network.

Realizing this, Insignia is working on an Enhanced-mode-compatible upgrade to SoftWindows, but that won't be available until the end of the year, at which time the next version of Windows—version 4.0, code-named Chicago—should be close to shipping. People need 486 mode right now, not the end of the year. Insignia says it will be several months after 4.0's release before SoftWindows will be upgraded to support it.

A third price is the cost. The $499 list price translates to a street price of about $350. While that's steep for an operating system (Windows 3.1, MS-DOS, and System 7 combined cost less), it's not unreasonable. But SoftWindows requires 16MB of RAM—that's another $350 or $400 for most Power Mac owners. (Why so much RAM? The Mac System takes about 3MB, while SoftWindows' emulation takes about 7MB. That reserves about 5MB for Windows itself and about 1MB for other Mac programs.) And for reasonable performance, you need a cache card in the Power Mac 6100 or 7100—that's another $200 from third-party cache vendors. Quickly, SoftWindows ends up costing you about $900. For a few hundred dollars more, you can buy a PC coprocessor board from Orange Micro (714/779-2772).

SoftWindows supports NetWare, so a Mac running it can be directly connected to a PC network. SoftWindows also runs on all models of the Power Macintosh. (The Orange Micro boards require a Mac or Power Mac with a 12-inch NuBus slot.) Users who won't be performing demanding tasks can run it—at less-than-optimal performance—on a system without a cache, which drops the total cost to about $700.

If you run Windows software occasionally, or run undemanding Windows software a lot—and the Enhanced mode support is not an issue for you—SoftWindows is a viable solution, but no more than that. For more-demanding or long-term needs, however, a hardware solution is a better approach. As Power Macs get faster, so should SoftWindows, but nonetheless, I'm not sold on SoftWindows as a long-term solution to Windows compatibility.—GALEN GRUMAN

**Power Mac Update**

**WordPerfect 3.0a**


**Pricing:** The company's suggested price is $495; current users of WordPerfect 3.0 for Macintosh can upgrade to the Power Macintosh version for $19.95 (basically the cost of the disks), users of WordPerfect 2.0 or earlier can upgrade for $89, and users of competing word processors can migrate to WordPerfect 3.0a for $99.

**Company:** WordPerfect Corporation (801/222-5000).

WordPerfect Corporation has wasted no time in shipping the native Power Macintosh version of WordPerfect 3.0. WordPerfect 3.0a has been recompiled to take full advantage of the Power Macintosh's features. Both the 68000 and Power Macintosh versions contain the same feature set and ship on the same set of disks.

WordPerfect uses the smart installer, which automatically detects whether a user has a 68000 or Power Macintosh and installs the appropriate version.

Macworld Lab performed a variety of speed tests using a WordPerfect 508K real-world file. We tested how long it took to open the file; perform a page scroll, find and replace, and word count; and change the font in the entire document. We then averaged the results. Macworld Lab performed these tests on a Power Macintosh 7100/66 with 8MB of RAM and a 250MB hard drive, and for comparison we performed the same tests on a Centris 650 with 8MB of RAM and a 230MB hard drive.

<table>
<thead>
<tr>
<th>WordPerfect</th>
<th>3.0a</th>
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<td>Centris 650</td>
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<tr>
<td>Average time to perform tests (in seconds)</td>
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The Centris 650 outperformed the Power Macintosh 7100/66 using the 680X0 version of WordPerfect. When running software written for 680X0 CPUs, the Power Macs performed at speeds between those of a 68000 and a Centris 650, according to our testing. Clearly, no one should buy a Power Mac to run emulated 680X0 software.—LAUREN BLACK
Plug and play takes on new meaning with the Photonics COOPERATIVE™ Transceiver. Using the latest in wireless infrared technology, it lets you create a portable network. So you can instantly access all your network resources — share files, synchronize calendars, print documents, send e-mail, whatever — without the hassles of hard-wiring. You can even use our access unit to bridge to an existing Ethernet network.

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MetaFlo’

Graphics Utility


Remember creating funny faces by pressing images onto Silly Putty and tugging on it? That’s basically the premise of MetaFlo’, a graphics utility that yields interesting visual effects with a minimum of fuss.

MetaFlo’ imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. For example, you can edit photographs to produce subtle changes, such as widening a smile or thinning the nose on a face. Or you can simply distort the subject matter, as you might to emulate the melting timepieces of Salvador Dali. When you’re done, MetaFlo’ renders a new image. And it can save the progression of image changes as a QuickTime movie, making special-effects animation a snap.

MetaFlo’ can juggle several image layers simultaneously to produce complex effects. It accepts both PICT and TIFF files. You can operate tools for scaling, rotating, skewing, distorting, and translating (moving) on the entire image or on user-defined segments. You produce localized distortions by defining a core segment and a surrounding boundary that softens the transition from distorted segments to unaffected areas. And any effect can be modified by a percentage. For example, you can reduce that newly applied smile by 20 percent or further expand a nose by 200 percent.

The program’s accuracy and flow controls let you fine-tune the interaction of core and boundary pixels. You can adjust the coarseness of core and boundary edges by changing the number of control points in the elasticity-importing grid used to calculate distortion effects. Higher settings offer more precision but require more calculation time. Still, after all the adjustments, the magic lies in how MetaFlo’ blends the distorted core and boundary with the rest of the image.

When applying multiple transformations, MetaFlo’ keeps track of the sequence in hierarchical fashion. Handy palette buttons permit unlimited undoing and redoing of effects, letting you move forward or backward through the hierarchy. For example, you could retreat several steps, alter a distortion’s percentage, and reapply the subsequent distortions to produce a different result. Transformation sequences are also stored in the program’s native file format, so you can produce variations from completed images or apply the same distortions on a substitute image.

MetaFlo’ keeps track of the hierarchy of transformations by letting you put snapshots of the current state of the image into a catalog. The catalog displays thumbnails in a separate window. Catalogs store the hierarchy of distortions, the order of image layers, the weight of each layer’s mask, and the distortion percentage. You can jump to any stored snapshot by simply double-clicking on the thumbnail. Unfortunately, you cannot automatically add images to the catalog. If you need a snapshot after each effect, you must conscientiously take each one.

The program’s layering ability lets MetaFlo’ produce complex visual effects. You can distort layers individually and manipulate other properties such as transparency. Each layer can accept a 32-bit image, and MetaFlo’ has a pop-up tool palette for producing masking effects.

In addition, layering gives MetaFlo’ the ability to create two kinds of morphs. The first combines two images by partially distorting each into the other. The result is a blending effect, like a facial composite. The second simply uses one image as a template that governs the distortion of the other. Both produce interesting and useful morphs, but there’s no Undo in either morphing mode. If you make a mistake setting control points, you must start over.

To create animations, you define the distortion steps as keyframes, and MetaFlo’ generates the intervening frames. You can set transition smoothness between keyframes as a percentage value, and there’s no limit to the number of keyframes and tween frames you can specify. You can define the sequence from the catalog without reapplying the effects step-by-step. MetaFlo’ stamps keyframes with SMPTE time-codes and offers a convenient Show KeyFrames feature that simplifies organizing an animation.

When you’re finished distorting and transforming, MetaFlo’ renders final images that are equal in quality to the original. Sliders let you adjust the sharpness of the image and its alpha-channel mask. Stills can be saved as PICT and TIFF files, and animations, in PICS and QuickTime formats. In prepress environments, an image’s CMYK channels can be distorted as individual layers. MetaFlo’ uses the values of the input image, preserving color balance.

Beyond the program’s obvious uses in image processing, animation, and graphic arts lie other less conspicuous applications, such as cosmetic-surgery visualization. MetaFlo’s layering capabilities and interface enhancements make it useful and versatile for professional use.

—CARLOS DOMINGO MARTINEZ
The latest buzzword in office automation is "collaborative computing"—using computers to let people work together from physically remote sites. Proponents of collaborative computing promise to eventually deliver such tools as desktop videoconferencing, electronic whiteboards, real-time document sharing, and virtual meetings. Today, though, collaborative computing boils down to E-mail. With the PowerShare Collaboration Servers package, Apple intends to create a standardized central server environment into which third parties can plug components. The only plug-ins currently available for such a foundation are E-mail gateways; and for straightforward E-mail routing, Microsoft Mail and CE Software's QuickMail are superior. And while PowerShare includes time services, user authentication, and cataloging, the interface to these facilities is confusing and poorly designed.

PowerShare runs as a "headless" application. It has no direct user interface other than an administration tool; instead PowerShare provides server services to other Macs on a network. The package consists of three applications—Catalog Server, Mail Server, and Admin. The two server applications run automatically on start-up, consuming 2MB each, and the Admin application consumes 2MB when you're performing administration chores.

PowerShare provides four services—cataloging, electronic-mail routing, time coordination, and user authentication—in conjunction with PowerTalk software running on client Macs. The services are useful ones. Central time services keep all the clocks of client PowerTalk systems in sync, ensuring that PowerShare correctly replicates centrally maintained catalogs on client machines. The Catalog Server lets you maintain a central store of information about PowerTalk entities—users, groups, and network devices. PowerTalk-savvy applications (such as the AppleMail component of PowerTalk) use catalogs to locate entities on the network—for example, to find a user to whom E-mail should be routed. The Mail Server manages mail queues for store-and-forward delivery of E-mail and lets you snap in third-party external mail gateways. The catalog server also acts as an authenticator—verifying to one client that another client is an authorized user. Some PowerTalk-savvy applications, use PowerShare's authentication services to ensure that encrypted mail goes to the proper destination and to certify that a given encrypted message is from who it says it is.

In principle this is all great. And in practice, the services run as advertised—once you get them configured. But setting up and maintaining a PowerShare server is not a chore for the faint-hearted. Configuration, ongoing management, and problem resolution—all things network managers must deal with daily—are odious tasks under PowerShare.

After three days dedicated to PowerShare, I could send mail from one machine to the others but not vice versa. Apple technical support couldn't help. I called ten times; six times I gave up after a minimum of 20 minutes on hold, and four times I actually spoke with Apple tech-support personnel. No one I spoke with had received any training on the product. When I asked how to get better PowerShare support, I was told I could buy a Technical Coordinator Answerline support contract for more than the cost of the software itself! If, after five years of experience as a network administrator, I have this much difficulty, I wonder how less experienced users will fare.

Making sense of Apple's sharp-looking but confusing (and unindexed) manual is anything but painless. The manual is a detailed guide for performing dozens of procedures, with no overview to make the entire process comprehensible.

Besides inadequate documentation, the Admin user interface requires dragging list entries between lists, with no visual cues about when such drags are allowed or what changes they effect. For en route E-mail, Admin shows that the messages are in an E-mail queue, but won't let you view information about the messages—such as the source or destination addresses—that is vital to diagnosing problems. The manual's terse troubleshooting section offers minimal help.

I've no doubt that collaboration computing is in the Mac's future. I also have no doubt that PowerShare, at least in its current form, isn't. Apple needs to overhaul the complex Admin application, add serious diagnostic aids, and provide comprehensive documentation before PowerShare will be ready for prime time.

—MEL BECKMAN

Apple's PowerShare The Admin application presents a bewildering array of windows and dialog boxes. Setting up and maintaining a PowerShare Server is not a task to be taken lightly.
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**Reviews**

**OneWorld Fax**

**Fax Server**

**PROS:** Entire office can share fax modems; easy to set up and configure. **CONS:** Cannot receive faxes; cannot queue more than one fax document at a time from a single CPU.

**COMPANY:** Global Village Communications (415/390-6200). **LIST PRICE:** $999; two-line server and two PowerPort Bronze II modems $1499.

**Fax modems are one of those technological advances that make our working lives easier. Unfortunately, technology is expensive, and putting a fax modem on everyone's desk adds up quickly.**

Global Village's solution, OneWorld Fax, is one of the easiest network-fax products to install and use. It has limitations, but it lets an office share fax-sending resources without dedicating a hard drive and CPU to the process, which is a benefit that few other network-fax products offer.

The OneWorld Fax is about the size of a package of Oreo cookies. It's configured with one or two Global Village PowerPort Bronze II fax modems (supporting 2400-, 4800-, and 9600-bps fax-transmission rates) as well as connections for a 10BaseT and a LocalTalk network (you can use only one network type at a time).

Installing the hardware involves plugging three cables into the back of the unit—that's it. The next step is to configure the server with the administration software provided. Configuration includes setting up users and passwords as well as establishing a priority-fax threshold (shorter faxes are placed ahead of monolithic documents). The threshold length can be configured on a user-specific basis or for all users.

You must install GlobalFax software on all client Macs; it lets clients send faxes and choose the OneWorld server (more than one OneWorld server can exist on a network but they cannot be linked together). OneWorld comes with a license for 30 users. Additional user licenses are available.

The GlobalFax software that ships with OneWorld has a window in the Fax Center that allows you to monitor the progress of faxes in the OneWorld fax queue. Document icons represent faxes in this window; dots mark the faxes that belong to you.

Several volunteers installed the GlobalFax software, and we had them send multiple faxes to see how the product performed. Overall, the product performed quite well. Most users were familiar with the hardware and had little difficulty selecting the server and sending a fax document. The priority faxes did as promised and skirted right past a few large fax transmissions.

We discovered that the fax server cannot queue multiple fax transmissions from a single user, even for group address-book entries. In other words, if you're trying to send out more than one fax, OneWorld can't queue the second document until it has sent the first one. Also, users cannot access both fax lines simultaneously; this is a limitation of the GlobalFax software and not the server. Global Village is currently debating whether to add multiple data streams to future revisions of the software. We all vote yes!

Network faxing is a timesaving, cost-effective way to reduce expenses. Other products exist to send faxes, but Global Village has a product that's easy to install and use at a price that won't knock a hole in your bottom line.—Matt Clark

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**ProFiles 1.0**

**File-Management Utility**

**PROS:** Keeps track of related files and folders; includes synchronization, compression, and expansion. **CONS:** High memory requirement; some file attributes appear only in pop-up lists; cannot display file contents.

**COMPANY:** Dyna Communications (801/269-7200). **LIST PRICE:** $129.

ProFiles is an unusual new utility that lets you group related files and folders for quick access. Unlike programs that present a continually updated view of a volume's directory, ProFiles displays an empty file list; you have to add items to the list either manually by selecting them one at a time from a standard Open File dialog box or automatically, using ProFiles' Find command. File lists can include volumes, folders, and files in any combination (see "ProFiles List"). You can view a folder's contents by clicking on a tiny triangle next to its name, just as you do with the Finder.

ProFiles' Find function works like the Finder's but is more comprehensive. You can specify up to three different search criteria (which you can save for later use), look for aliases whose original items have been deleted, or search for files that contain a specific string of text. ProFiles' file list is also more functional than the Finder's in several respects—for example, you can view modification and creation dates, path names, and invisible files. But ProFiles only lets you display a file's type, creator, and version by double-clicking to the left of the file name, and you can't edit any of the information in the list.

ProFiles provides an extensive suite of actions you can perform on files and folders. In addition to mundane functions such as copying, moving, and printing, you can create aliases, move items to the desktop, and turn sharing on and off. You can also compress or expand selected items by using an algorithm that you select in the preferences dialog box—ProFiles ships with Aladdin Software's StuffIt engine but also supports Symantec's AutoDoubler and DiskDoubler.

Because ProFiles can save file lists and can reference items on local or remote volumes, the program is useful for people who share files over a network. If you try to open an item on an unmounted disk, for instance, ProFiles attempts to load the correct volume for you—even logging on to a remote network with Apple Remote Access, if necessary. If you work with more than one Mac, ProFiles' synchronize function lets you update two folders so they both contain the most recent versions of files.

Unfortunately, ProFiles doesn't take the place of some of my favorite utilities. For example, PrairieSoft Software's DiskTop is faster for routine copying jobs, and ProFiles' List the icon to the left of ProFiles Review in the file list shows that the volume isn't currently mounted.

I still need a DA like On Technology's On Location to examine a file's contents. Also, ProFiles' recommended RAM allocation of 1MB may be a problem for computers with limited memory (however, it uses only 384K of disk space). Still, ProFiles is worth considering if you have to keep track of associated files and folders scattered over a network.—Franklin N. Tessler

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**ProFiles List**
Mac-to-TV Converters

Video Adapters

L-TV Portable

PROS: Includes all cabling; sturdy; inexpensive.  
CONS: Some flicker and distortion.  

The Presenter Plus Mac/PC

PROS: All cables included; supports Macs and PCs.  CONS: Fit TV feature sometimes cuts off menus; murky focus; screen flickering.  

Focus Enhancements and Consumer Technology Northwest now offer small, external TV-converter units that plug directly into your Mac's built-in video port and convert the Mac's video output to NTSC. These portable devices make using a TV as a Mac display easier than ever, but frankly, they don't deliver the same results as the NuBus and PDS cards designed for Mac-to-TV output.

The Presenter Plus Mac/PC

This compact unit supports output to television from most Macs with built-in video—all Quads and Centrises, the LC series, and those PowerBooks equipped with external video ports. Though you can use The Presenter with the IIvx and IIvi, it doesn't work with a IIci or IIls.

The Presenter is a black plastic box slightly smaller than a Newton. The 26-inch unit connects to a TV or VCR via either a composite-video or an S-Video cable (Consumer Technology supplies both). The unit operates from a 9-volt external power supply and includes an AC adapter. You must snap on a Mac adapter (also supplied) to use the included DB-15 computer cable. The cable works, but the adapter makes it hard to attach the cable snugly to the video port; a genuine Mac cable would be nicer. A second video port allows you to attach a VGA monitor to The Presenter along with the TV for dual output.

The device comes with a system extension and a bare-bones control panel designed primarily to fit your Mac's screen within a television monitor. You can activate this Fit TV feature by holding down the T key during start-up. Unfortunately, the software sometimes doesn't do the job. In my tests, the edges of the screen got cut off when I connected my TV to a Quadra 700 and an LC. In one case, the Apple and application menu icons were off screen—though the menus themselves were visible when I clicked in the appropriate corner. To avoid this, you can type a specific resolution into the control panel, choosing a size that will place your desktop well within the bounds of the TV.

The Presenter's antiflicker hardware does a barely passable job of providing a stable image on the television screen; flickering persists, and the image is generally fuzzy and poorly focused.

L-TV Portable

The L-TV supports the same Mac models as The Presenter, offers both composite-video and S-Video connections to a TV or VCR (all cables included), and has an additional port for simultaneous output to a VGA monitor. Both devices support cross-platform use and are lightweight and compact enough to travel with a PowerBook. However, the less-expensive L-TV feels sturdier. It comes with its own stand and ships with separate Mac and PC cables. The unit is housed in a slate-gray case to match PowerBooks.

The L-TV's screen-fitting features are built into the hardware and are activated by DIP switches. An optional system extension is included to squeeze the Mac's screen to the TV's proportions if the hardware system fails to accommodate your Mac-to-TV configuration.

Unfortunately, like The Presenter, the L-TV failed to provide high-quality output via a composite-video connection. The unit provided a crispier, cleaner image, but while flickering and conspicuous shimmers were still persistent. When I activated the device's picture-stabilizing feature, the picture improved, but the menu bar became distorted despite the screen-squeezing software.

In the end, I preferred the L-TV's sharper (but slightly less stable) image to The Presenter's murky output. The Focus package is more solid as a whole.

—JOSEPH SCHORR

Mac-to-TV Cards

Video Adapters

L-TV Pro NuBus

PROS: Supports wide range of Macs; displays up to 32,768 colors at 640-by-480-pixel resolution.  CONS: Some flicker and distortion despite flicker-filtering software; can't switch between PAL and NTSC modes; cables not included.  COMPANY: Focus Enhancements (617/938-8088).  LIST PRICE: $399.99.  

Simple TV

PROS: Diagnostic software included; impressively flicker-free image; supports both S-Video and composite-video connections.  CONS: Screen mirroring degrades performance; no documentation on diagnostic software; resolution limited to 256 colors.  COMPANY: E-Machines (408/541-6100).  LIST PRICE: $439.  

A S A RULE, TELEVISIONS MAKE POOR computer monitors; colors aren't very accurate on an ordinary TV screen, and the resolution is relatively crude. Still, for certain applications—children's games, slide presentations, Mac training programs—a television can be useful as a low-cost display device. E-Machines and Focus Enhancements now offer PDS and NuBus video cards that convert your Mac's RGB video signal to NTSC (the U.S. television standard) or PAL (the European standard) so you can use your Mac with a television or VCR.

Simply TV

The Simply TV is an easy-to-install video card that plugs snugly into the Processor Direct Slot (PDS) of any Color Classic, LC-series, Quadra 605, or Performa-series Mac. The Simply TV documentation promises you'll be up and running in five minutes—and it's absolutely true.

The card has two jacks: one for the standard composite-video cable that connects to most VCRs with an RCA-plug video-in jack, and one for televisions that support higher-quality S-Video input. A composite cable comes with the package; you simply plug one end into the card itself and the other end into the video-input port on your TV or television.

The Simply TV's accompanying software is also very easy to use. A control panel includes two useful features: Safe-
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Circle 69 on reader service card
Title ensures that the Mac’s menu bar won’t be cut off on the TV screen; and Flicker-Free does a fine job of providing a stable, smooth image on screen with minimal flickering and bleeding. The control panel also supports screen mirroring, which makes the TV display the same image as the primary monitor. Mirroring, however, noticeably slows down performance and degrades the speed of screen redraws. A utility, Diagnostics, isn’t needed to use the Simply TV, but it provides test patterns and color bars you can use to color-calibrate your TV.

L-TV Pro NuBus
Focus Enhancements’ L-TV Pro is a NuBus version of Lapis Technologies’ original L-TV card, which was specifically designed for the PDS slot of LC-series Macs. The beefed-up L-TV Pro NuBus supports a wider range of Macs than the Simply TV, including the Mac II series, the Performa 600, the Centris 650, and the Quadra family. (Focus also has a smaller, 7-inch version for use in the Centris 610.) PDS versions of the card are still available for use with the Color Classic, LC series, and Performa 400 series.

The L-TV Pro offers up to 32,768 colors at standard-size 640-by-480-pixel resolution. Like the E-Machines card, the L-TV allows you to record output to a VCR, or display directly to a television via either a composite-video connection or S-Video connector. The L-TV does not come with cables; you must buy your own or get a $50.99 cable package from Focus.

The TV Show software allows you to use the television as a second display or to mirror your primary display. The easy-to-use control panel also provides flicker filtering to stabilize the screen image.

The two cards perform comparably. Overall, I found that the Simply TV provided a somewhat more stable image than the L-TV card, which, despite its flicker-reducing features, displayed an image that sometimes shimmered noticeably. Also, though you probably won’t need a card that supports anything but NTSC in the United States, the L-TV Pro doesn’t switch between NTSC and PAL, as the Simply TV does; a different L-TV card is necessary for use with PAL.

Of course, whichever card you use, the results are going to be less than gorgeous. Menu commands, for example, are hard to read on a television. And you can’t expect anything more than an approximate match of the colors you see on a monitor. But for presentations and applications that don’t require high-resolution images or small text, a television and a converter-equipped Mac are a respectable combination.—JOSEPH SCHORR

SupraFaxModem 288

Supra is paving the way for life in the fast lane with its new line of 28,800-bps modems. Even though the new ITU-TSS V.34 modem standard has yet to be finalized, Supra has based its new product on a chip set from Rockwell that supports V.34, a preliminary version of the new modem standard. Since other manufacturers are using the same chip set, you should be able to find someone to connect with at the modem’s maximum speed if you look hard enough. The modem also supports existing modem speeds from 14,400 bps down; fax capability maxes out at 14,400 bps.

From a distance, the SupraFaxModem 288 looks like other desktop modems from Supra. Only the “28” label and the small print referring to 28,800-bps data reveal the product’s true colors.

The Supra modem ships with PST’s Facilitate software, which packs all of its features into a convenient pull-down menu that you access from the menu bar. You can send faxes to a single location, broadcast them to a group of recipients, and defer transmission to a preset time. When sending or receiving a fax, you get a full status report from the FaxActivity desk accessory. Although printing faxes is not automatic, it is fast. Just open the In Basket from the Fax menu, click on the appropriate fax entry, and choose the Print command. In my tests, faxes were clear and sharp and printed in seconds.

Although fax software is notorious for causing a litany of extension conflicts, I found Facilitate to be basically trouble-free, even when used on my new Power Macintosh. The only features I miss are the ability to print a fax automatically after it’s received and an OCR engine to convert faxes into editable text.

The communications software, MicroPhone LT from Software Ventures, is the same basic application as MicroPhone II and MicroPro Pro, but it doesn’t let you create your own scripts. It does work with scripts created by the other versions of MicroPhone, though. The package ships with scripts for online services such as CompuServe and GEnie, and for Software Ventures’ own BBS, should you need technical support.

Supra has clearly learned some lessons. The SupraFaxModem 288 has none of the shortcomings of the older V.32bis model, which had occasional speaker failures early in its production cycle and required several ROM upgrades to fix connection problems. I connected to a variety of online services and BBSs during my testing and had almost no difficulty getting a reliable hookup. Though full 28,800-bps service was hard to come by, I did achieve consistent 24,000-bps connections with Supra’s own BBS. Unfortunately, the quality of local phone lines is going to be a limiting factor in supporting the new modem speed. One hopes the ITU-TSS can provide additional methods to handle difficult connections when the V.34 standard is ready.

Supra’s own ROM upgrades can be done via its flash ROM and will be available for downloading from the company’s BBS or on disk. Doing a ROM upgrade yourself involves running a program that downloads the software directly to the modem—a process that takes three to five minutes. But when the V.34 standard is final, the modem’s data pump (processing engine) itself will have to be replaced. That will require returning the modem to the factory for installation, or swapping it for another unit. The initial price will be $69, but if you’re willing to wait a few months for chip supplies to increase, the price will go down to $49.

Despite my difficulty in finding places to connect to at its maximum speed, the SupraFaxModem 288 is a very good performer, as good as or better than 14,400-bps modems I’ve tried, and the price of admission isn’t terribly steep. Combined with fast, stable fax software and a good terminal program, it’s hard to beat.

—GENE STEINBERG

MACWORLD August 1994 75
The Macworld Magazine WORLD CLASS AWARD for training sits in my office. The readers of Macworld voted for MacAcademy by a margin of 2 to 1 over audio training systems, disk based systems, and all other training companies and products. Simply, we won because our training works! It’s affordable, it’s flexible, it covers an incredible amount of programs, it’s simple to use and it’s guaranteed! We won the award because over 250,000 satisfied customers are proof that MacAcademy training programs will work for you. Below please find a current listing of the MacAcademy Video Training Library. Each video is approximately two hours in length and costs only $49. Each video carries a complete money-back guarantee if not totally satisfied and can be upgraded when software is upgraded for only $14.95.

Randy Smith

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Circle 106 on reader service card
DiskDoubler 4.0

File-Compression Program

**PROS:** Compresses and expands files faster and tighter than rivals; files can be dragged among archives. 

**CONS:** Lacks many great features of previous versions; archives incompatible with previous versions; outrageous phone-help price. 

**COMPANY:** Symantec Corporation (503/334-6054). **PRICE:** $79.95.

---

**HE ORIGINAL DISKDOUBLER (DD)** could compress files into a disk-space-saving format faster and more tightly than its competition. And DD was breathtakingly simple to use. You highlighted a file's icon and chose Compress from the DD menu in the Finder. A simple double-click sufficed to both expand and open a DD file. But it didn't take long for rivals StuffIt (Aladdin Systems) and Now Compress (Now Software) to duplicate DD's Finder-menu interface—and its compression efficiency. The world waited: would 4.0 again set DD in the forefront?

In pure efficiency terms, yes. DD has five compression settings, three of which are new. The default, DD1, compresses by a few percentage points faster and tighter than other programs. Other options strike different positions on the speed-and-tightness trade-off scale. For example, the AD1 setting compressed my test files in one-sixth the time of StuffIt, but it compressed them only half as much. At the opposite extreme, the DD3 setting crunches files to an average of 40 percent of their original size, but it takes a third longer than StuffIt to do the deed. You realize the most dramatic speed gains, however, when expanding DD's files; regardless of the compression setting, DD files decompress about twice as fast as StuffIt or Now Compress.

DD can also open or convert StuffIt files. (StuffIt, on the other hand, can open a long list of Mac and IBM compression formats.) Unfortunately, the three new DD 4.0 file types can't be opened by older DD versions. Better send the free DD Expand 4.0 program to all your digital correspondents, or you'll be stranded on an island of incompatibility.

DiskDoubler also now offers archiving, which lets you compress multiple files into a single icon. Using a clever Finder-like interface, you can add files to, remove files from, or move files among archives, simply by dragging icons. Alas, you must do all this from a separate application; for the first time, DD users have to step out of the Finder's familiar bounds.

Unfortunately, what you notice most about the new DiskDoubler isn't what's new. It's what's missing. You can no longer add passwords to self-extracting files. You can no longer opt to recompress files automatically. The Skip button (when compressing a group of files) is gone. The Verify/Repair program (helpful for in-

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**How Does DiskDoubler Compare?**

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Tests were conducted on a Quadra 800, with Verify/Repair off. Files included a QuickTime movie; an application: a FileMaker Pro database; font, music notation, Ink, PICT, and 24-bit TIFF files; and Excel, FreeHand, PageMaker, and Word files.

---

**Full Contact 2.01**

**Personal Information Manager**

**PROS:** Object-oriented database heart leaves flat-file and relational engines in the dust. 

**CONS:** Makes managing your personal information a full-time job.

**COMPANY:** FIT Software (408/562-5990). **LIST PRICE:** $169.

---

**THE PERFECT PIM? IMAGINE A VIRTUAL secretary on speed, filing and cross-filing all your data so that you could instantly retrieve every phone conversation, meeting, project, person, phone number, company, address, and correspondence related to a contact, just by typing in that contact's name. FIT Software's Full Contact (FC) is the closest approximation of this ideal currently available: it's an object-oriented database in which almost every piece of information occupies its own record, and related records are linked for easy access. The advantage of FC is a database that's fast, versatile, and powerful. The disadvantage is that to use this personal organizer, you must already be incredibly organized.

Records in FC are divided into six types: Activities, Contacts, Phones, Addresses, Companies, and Notes. Any record can link to any other record; a contact might be linked to several notes (conversations), three other contacts (co-workers), and two phones. Each of those records could then have other records linked to them—for example, one of the phone numbers could be linked to a company and other contacts. Linking records establishes software connections between bits of data that you have already related in your mind. You can create a new, linked record from within another record, or you can link existing records by dragging and dropping one onto another.

Having to manually link all your data gets cumbersome, so FIT thoughtfully provides Quick Phone Call Entry (QPCE) and Quick Contact Entry (QCE) screens. Filling in a QPCE is a snap; FC offers its best guess at the company or contact name while you type, complete with a pop-up menu of qualifying candidates. FC also has an extensive series of templates to ease importing data. I switched from Now Software's Now Contact and Now Up-to-Date with hardly a hitch—not a bad trick considering their semilinked nature.

Superlists—windows that display records as fields in columns—are the main continues
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<th>Speedster 33i w/cache</th>
<th>Speedster 33i w/FPu &amp; cache</th>
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<td>DayStar Turbo 040</td>
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For Mac w/supporting built-in video, video card may be required; call for more information.

How to Order: We accept Visa, MasterCard, American Express, Corporate and Education P.O.'s. Cache is free with Speedster 33i, 33f, and 040 models only. Competitive pricing is as of 4/22/94. All trademarks are property of their respective holders. Mobius, 5835 Doyle Street, Emeryville, CA 94608. (510) 654-0556.
way to view your data. Each record type has a separate Superlist, which is good and bad. You won't confuse a company with a contact, but you can work directly with only one type of data at a time. (You can't, for instance, bring up a list of all the Companies and Contacts in California.)

You select records to view by using filters, FC's version of a search—you define the criteria, such as a range of dates, and FC filters the records. Filters are fairly versatile, and you even get a dialog box loaded with pop-up menus to help you build the perfect filter. But FC depends on filters heavily, and using them is a chore. You can't edit a filter unless you've first used it, which means you select a filter, wait as the software sorts, and you end up with a bazillion filters.

There are pleasant amenities and cool features sprinkled throughout FC, but the program makes using them an effort. When linking to a contact record in a QPCE, FC forces you to enter the contact's last name and then first name, separated by a comma; elsewhere, the software concatenates a phone number with its descriptor (Main, Fax, and so on), so easy lookup is impossible. FC has a word processor with drag-and-drop mail merge, but it makes you juggle two pop-up menus nearly every time you write a letter. You can create repeating events, but only the first iteration appears in the Activities window. There are also a ton of tiny irritants: Notes windows can't be resized, new Activities always appear halfway off the screen, and Superlists don't automatically re-sort. Topping this catalog of unpleasant surprises is the lack of a database-wide search function.

Full Contact can handle with speed and style tasks that would choke other PIMs. But 90 percent of the time, using Full Contact feels like a full-time job.

—Cameron CroTTY

Scenery Animator 1.0.4

Scenery Animator lets you position a simulated sun to create shadows. You can alter the colors of land, water, and sky—say, to darken a cloudy landscape or add a rosy tint to a sunset scene. Here, the same image was rendered with different light and color settings to show dawn and dusk.

Scenery Animator is a pleasure to use. The manual is clear and informative, the program is well designed (although navigating through landscapes takes some practice), many customization features are provided, and the rendered pictures and animations are impressive. My main complaint is that the program's map coordinates can't easily be matched to the coordinates on a paper topographical map (Scenery Animator uses coordinates relative to the lower left corner of the map, rather than absolute coordinates such as longitude and latitude). For example, to create a digital picture of my campsite in Yosemite, I'd have to compare the terrain on the paper and computer maps and estimate where the site was. A Natural Graphics representative said the company is considering adding digital line-graph overlays, which would show roads and other man-made features. I also wish I could display distances in feet as well as meters (I can't help it—my public school failed to drum the metric system into my head), and for some graphics tools to add objects to scenes. But Scenery Animator's flaws are few, and I'd recommend it to artists, animators, educators, and armchair travelers. —Erfert Fenton
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Koyn Fractal Studio 2.02

**Educational Software**

**PROS:** Creates colorful fractals at up to 2450 dpi; draws-program-like fractal design; fast rendering.  
**CONS:** Cannot create many classic fractals, poor program design; saves images only as PICT.  
**COMPANY:** Koyn Software (314/878-9125).  
**LIST PRICE:** $149.95.  

**FRACTALS**—SHAPES CONTAINING infinite detail and that often exhibit self-similarity (portions of the shape resemble the whole shape)—are one of the most spectacular intersections of science and the visual arts. Koyn Fractal Studio enables you to generate beautiful fractals of your own design by means of Iterated Function Systems (IFS). To do so, you first draw the basic outline with a simple polygon tool, either frehand or by using an imported image as a template. You then clone the outline one or more times, alter each clone, and hide all the outlines (see "Handmade Fractals"). You can color the background, assign a color to each part of a fractal, and specify a number of attributes that blend colors and create textures.

At 72 dpi, Fractal Studio renders 8-bit fractals relatively quickly (in a few minutes), especially if your Mac has an FPU. You can specify renderings at up to 24-bit color and 2450 dpi, but these require major investments in RAM and time. Once your fractal has been rendered—and Fractal Studio is capable of beautiful renderings—you can zoom in (up to 1 million times, according to Koyn Software) on any area. Rendered fractals can be saved only as PICT files.

Although Koyn Software says the program is for fractal innocents and experts alike, prior experience certainly helps. The manual’s tutorial section and the collection of sample fractal files assist novices to get going, but frankly, few people can make fractal geometry seem easy, and the manual’s author is not one of them. Sadly, the design of the program doesn’t help either. Among other things, there are tools that should more logically be commands, and commands that are tools in many graphics programs. There is no easy way to make regular polygons or create a clone that is a specific fraction of the basic outline’s size. And defining a color scheme requires visits to a variety of dialog boxes.

Iterated Function Systems—generated fractals range from abstract shapes to mimics of natural forms such as leaves, trees, clouds, and snowflakes; but IFS is not the only fractal-generation method. There are many classic types of fractals—including the Mandelbrot and Julia sets and realistic fractal landscapes—that Koyn Fractal Studio cannot generate; for these types of fractals, you will have to turn to a program like Springer-Verlag’s more versatile but more challenging Beauty of Fractals Lab. Koyn Fractal Studio is a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it is not an all-fractals-for-all-people program. That program has yet to be written.

—ROBERT C. ECKHARDT

The Cruncher

**Educational Spreadsheet**

**PROS:** Creative: easy to use; educational.  
**CONS:** Slow; lacks necessary spreadsheet functions.  
**COMPANY:** Davidson & Associates (310/793-0600).  
**LIST PRICE:** $59.95.  

**KIDS AND ADULTS SHOULD LIKE THE Cruncher,** a combination educational spreadsheet and business application. As a teaching tool, it shows kids spreadsheet basics; as a spreadsheet, The Cruncher can calculate and graph.

The Cruncher’s clever, creative animated tutorials demonstrate how spreadsheets calculate. A selection of projects shipped with The Cruncher can help kids figure out if their families can afford a dog or a new stereo. You can even customize recipes using the Recipe Converter template, you type in a recipe and the number of people the original recipe serves, then indicate how many people you want to serve, and the template converts it for you. (This is a use I’d never thought of for spreadsheets—I’m sure my future dinner guests will be grateful.)

The Cruncher performs basic spreadsheet functions like graphing, number formatting, and calculations. But users accustomed to more-sophisticated spreadsheets like Microsoft Excel will miss such functions as the ability to wrap text in a cell and to sort data. Also, calculation formulas can be hard to understand. For some functions, you can use basic spreadsheet functions like =D3/F3. But if you want to multiply that number by five, you have to write =SUM(D3/F3*5). It’s hard to know when you need to insert the function type (SUM, in this case) in the formula.

Aside from the calculation confusion, the only technical problem I had with the product was its sound. Even though my Sound control panel was set to zero, The Cruncher played music at a normal level—to the dismay of my coworkers—and I couldn’t figure out how to turn off the start-up sound. Other than that, the Cruncher is uncomplicated. Information is easy to find in the manual and online, and when I called, Davidson’s technical support was helpful.

The Cruncher is more effective as an educational tool: its spreadsheet capabilities are limited. If you can live without the advanced functions and can tolerate the slow speed, The Cruncher is a good spreadsheet choice. If you want to teach a child spreadsheet basics, The Cruncher will do the job.—JOANNA PEARLSTEIN
Should the New MiniCad 5 be your CAD Program?

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MiniCad 5 offers all of the above and more. The award-winning software has been hailed as the “features champion” by Macworld Magazine (March 1993). Further, Graphsoft is dedicated to aggressive investment in CAD R&D. Graphsoft customers stay more productive than their competitors because Graphsoft supports both the latest technology and evolving user needs. MiniCad has long been the price/performance leader in Macintosh CAD. Don’t be steered away from MiniCad by VARS who want you to buy high-priced CAD products that are hard to learn and only do a few things well. The VARS won’t tell you that MiniCad ships with a multimedia training CD, or that you receive 18 months of free technical support with Graphsoft products or upgrades. In short, MiniCad keeps more of your money in your pocket. Buy MiniCad 5 and save!

MiniCad 5 also includes speed increases up to 100% even on 68K-based Macintoshes, a Claris CAD conversion program including a $495 upgrade price, a Claris CAD translator, and a helpful conversion guide, translators for importing and exporting to the other major CAD products, an upcoming Windows version, multi-media training CD 18 months of free technical support and a no-hassles 30-day money-back guarantee through authorized dealers. Contact Graphsoft today for detailed literature. To order immediately, call MacWarehouse, MacConnection, or your local dealer. Demo: $19.00Buy MiniCad 5 and save!

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Circle 46 on reader service card
REMEMBER WHEN YOU FIRST GOT your Mac? The hard drive seemed a vast, open expanse you couldn't wait to fill with the latest software and your great American novel. By now, though, you've probably spent far too much time managing that territory—moving files around and rummaging through folders in search of documents.

Hierarchical menu utilities, such as Now Software's WYSIWYG Menus, Inline Software's HAM, and Kiwi Software's Kiwi Power Menus, all take a similar approach to the file-management challenge. Rather than make you open a dozen windows to find that control panel or document buried deep in your drive, hierarchical menus enable you to put frequently used folders, subfolders, and aliases in the Apple menu and then open them using simple pop-up menus. But these utilities limit you to the folders and applications you've had the foresight to put into the Apple Menu Items folder. If you're already that organized, maybe you don't need hierarchical menus to begin with.

Inline Software's PopupFolder goes a step further by giving you hierarchical access to all the folders on your Mac. By clicking and holding on the icon of any folder, mounted volume, or floppy disk you instruct PopupFolder to search that item (up to five folders deep), giving you easy access to documents and applications all over your drive.

PopupFolder is primarily a Finder enhancement, but it also operates within applications, so you can use hierarchical pop-up menus to save and open files. Best of all, filing existing documents in folders becomes a simple matter of grabbing the files you want to put away and then dragging them onto the appropriate icon. When the menus pop up, you just drag the files and drop them into any folder.

When it is readying pop-up menus for every folder, PopupFolder seems sluggish; the program hesitates slightly over each icon while it scans your Mac's contents. Changing the mouse's double-click speed can help, but if many subfolders are nested on your drive, the slowdown can be a trifle annoying.

PopupFolder is easy to install—just drop the control panel into the System Folder and restart your Mac. But be aware that you may need to disable certain extensions when you restart the first time after installation. PopupFolder's registration dialog box wants to be the first item that launches, and if you are running start-up extensions such as E-mail or virus-protection software, PopupFolder can cause a crash when you restart.

For the most part, PopupFolder is so handy and intuitive to use, you wonder why it isn't built into the Mac's system software. For those of us with hard drives full of folders packed within folders, it's a welcome improvement to Finder navigation.

—MATTHEW HAWN

### PopupFolder

**Finder Utility**

**PROS:** Simple and intuitive; provides easy access to files and data.  **CONS:** Can be sluggish on full drives.  **COMPANY:** Inline Software (203/435-4995).  **LIST PRICE:** $59.95.

### DateView 1.0.1

**Calendar/To-do Manager**

**PROS:** Easy to learn; integrates with InTouch contact manager.  **CONS:** Can't see to-do's in grid view.  **COMPANY:** Advanced Software (408/733-0745).  **LIST PRICE:** $99.95.

With DATEVIEW, ADVANCED SOFTWARE is aiming at personal-calendar users who are willing to sacrifice some features to get simplicity and speed. DateView loads its files completely into RAM, so it's a good choice for PowerBook users—since it won't spin up the hard disk, it saves battery power. DateView is a single-user product; if you need to share your calendars with other users, then Now Software's Now Up-to-Date or Aldus's Datebook Pro are better choices, as both are networkable and multiuser programs.

DateView has two types of multiday display modes. The list display shows events and to-do's sequentially (see "Schedule View"); the grid display shows days with lines marking times. Double-clicking on the header of any day zooms in, filling the screen with the day's agenda. You can customize the list or grid displays to view one or more weeks at a time.

The program allows four types of events: Block of Time, Point in Time, Date, and To-do. You can set to-do's to carry forward if not marked as completed. You can enter a series of recurring events in a single step and later reschedule one event in the sequence without affecting the others. DateView shows overlapping events side by side in the grid display.

It's easy to enter new events. If you're in the grid view, you just click and drag across the time the event will occupy; the Edit Event dialog box appears, and you set the type of event and fill in the event's description. You enter new events in list views by double-clicking on the day, which brings up the Edit Event dialog box.

One drawback is that to-do's appear only in list views; if you're in a grid view, you can't see to-do's at all. I found this so annoying that I invariably used only list views. I'd also like to see 8-key equivalents for the pop-up menu choices in the Edit Event dialog box; as it stands now, you must leave the keyboard and use the mouse to set the category, type, and priority of an event.

DateView can link events to Advanced Software's InTouch contact manager, even under System 6.0.X. Linking a DateView event to InTouch is very easy and takes only a few seconds. However, linking in the other direction, to a date from within InTouch, is considerably slower.

If you have complex scheduling needs, then you'd be better served by a program with more features than DateView offers. But if you want a calendar program that takes only a few minutes to learn and can handle basic scheduling, DateView makes sense.—TOM NEGRINO
DeBabelizer Lite 1.0

Graphics-Conversion Software

**PROS:** Supports a huge variety of file formats; simple interface; batch processing; supports many Photoshop plug-ins. **CONS:** Bitmapped formats only; some plug-ins don’t work with it; images must fit in RAM. **COMPANY:** Equilibrium Technologies (415/332-4343). **LIST PRICE:** $129.

When I first started using DeBabelizer, I was astounded at its prowess in opening, converting, manipulating, and processing graphics files of almost any format—quickly and automatically (see *Reviews*, November 1993). Its $299 price tag placed it out of the reach of people who only occasionally need graphics conversion, however, and its complex interface was daunting for casual users.

Equilibrium Technologies addresses both of these issues with DeBabelizer Lite—a version of the original program with a much narrower range of capabilities, a $129 price tag, and an interface that any Macintosh user can navigate easily.

At its most basic, DeBabelizer Lite is simply a program for converting graphics files from one format to another. Gone are all the esoteric options for dithering, resizing and resampling, scripting multiple operations, remapping color palettes, and the like. DeBabelizer Lite opens graphics files in one format and saves them in another.

You can convert individual files, or instruct the program to go through a whole folder and convert every image in the folder. An ingenious set of options lets you rename the resulting files sensibly.

Although there’s a lot less to DeBabelizer Lite than its older sibling, not all of the controls are gone. There are options for saving in various flavors of key formats (color/gray scale, and compressed/uncompressed TIFF, for instance) and for changing the number of colors in an image. And you can choose from a few common Mac and Windows color palettes. You can also change the image’s aspect ratio from DOS PC to Mac or vice versa—avoiding the squashed or stretched look that commonly results from moving screen shots between platforms.

Many Photoshop-compatible plug-ins work within DeBabelizer Lite, including filters and acquire and export modules. The program can even run a filter on a batch of images in a folder as each image is being translated. Unfortunately, many plug-ins that come with Photoshop only work with Photoshop (for example, the sharpening filters and the JPEG Export module).

DeBabelizer Lite’s only other major failing is its use of RAM for image processing. If an image doesn’t fit in the program’s allocated memory partition, you can’t use DeBabelizer Lite to convert it. This is far from fatal, but it’s worth considering if you’re short on RAM and don’t want to resort to the sluggishness of virtual memory.

DeBabelizer Lite is a terrific graphics utility, offering a choice selection of its forebear’s capabilities at a nice, slim price.

—Steve Roth

If you want to see a full 81/2" x 11" spending a lot of money, only

![Typical 17" monitor](image1)

$1,100

![Portrait/15 Pivot](image2)

$799

![Typical 20" monitor](image3)

$2,100

On the Menu  Many graphics professionals will find that DeBabelizer Lite’s selection of graphics file formats offers all that their images require and more.
TimeSquare 1.0

Scheduling Program

PROS: Fast; flexible viewing options. CONS: Labels cannot be grouped; no multitask events; limited error notification when importing data. COMPANY: Team Building Technologies (514/278-3010). LIST PRICE: $149 for two users.

If your paper organizer is jam-packed, then it's time to consider a computer-based scheduler like TimeSquare. Unlike programs that restrict you to viewing single days, weeks, or months, TimeSquare lets you decide exactly how many days to display. You can also specify whether the calendar scrolls forward or backward in weekly or daily increments.

TimeSquare supports two types of events: to-do's, which aren't associated with any date or time, and timed activities, which are. You can set timed activities to carry forward on a daily basis until they're marked as completed. Unfortunately, you can't schedule activities that span several days. TimeSquare does support recurring events, but not as flexibly as other programs.

TimeSquare's alarm extension can remind you about timed events up to 999 days in advance, even if the application isn't running. When a pop-up alarm appears, you can clear it permanently or indicate that you want to be notified again up to 60 days later. If you don't respond in 1 minute, the alarm disappears, only to reappear in 5 minutes. You can't snooze an alarm without using the mouse, however.

TimeSquare lets you categorize activities by assigning labels to them. You can define up to 30 different labels, each with its own color. Since events appear in the color of their label, it's an easy way to pick out related events in a busy schedule. The only missing feature is the ability to group labels into sets as you can with Now Up-to-Date. (Now Up-to-Date's sets make it easy to view all related categories or labels, such as all personal activities.)

TimeSquare supports multiple users by making extensive use of System 7's publish and subscribe. People on a network can view—but not alter—activities from another calendar by subscribing to a published edition that includes all of the events assigned to any label in the original file. If two people need to modify events in a calendar, however, they must have read-write access to a common calendar file.

For those rare times when you're away from your Mac, TimeSquare lets you print your schedule in a variety of formats. TimeSquare also lets you import and export calendars as either tab- or comma-delimited files. (If you try to import an event with a description field longer than 255 characters, the import process terminates without telling you why.) TimeSquare's manual is clearly written. Finally, technical support is friendly, if not roll-free.

In all, I was quite impressed with the first release of TimeSquare: it's fast and builds on the strong points of its predecessor, AgentDA. With a few changes, Team Building Technologies could have a winner.—FRANKLIN N. TESSLER

Page without scrolling, shrinking, or the Portrait/15 Pivot makes sense.

Let's face it. A monitor is only as good as its ability to show you a readable page of text. And since you're reading this ad, you've probably run out of patience with the standard landscape monitor you're currently using—the one that forces you to constantly scroll up and down. Or shrink everything to tiny, unreadable page previews.

You could upgrade to a 16" or 17" landscape monitor. But even a 17-inch only shows you about 65% of a full page. So you'll still end up scrolling. Or shrinking.

A fancy 20" model would be more than enough to do the job. Unfortunately, it would also break the bank.

Which leaves the Portrait/15 Pivot, the only affordable, full-color portrait monitor that lets you see a whole page of perfectly readable text. On a Macintosh, a Power Mac, or in Windows. If the Portrait/15 Pivot looks like a great value, you haven't seen the half of it.

That's because buying a Portrait/15 Pivot is like getting two multi-frequency monitors for the price of one. All you do to reach up, grab the corner, rotate, and your portrait monitor instantly becomes a landscape monitor—no switches to set, no cables to change.

Portrait or landscape, you'll appreciate Macintosh resolutions up to 832 x 624 (up to 1024 x 768 in Windows), flicker-free refresh rates of 75 Hz and the sharp, clear images that only 28 mm dot pitch can give you. Just what you'd expect from a monitor that combines the best of Radius and Portrait Display Labs' technology.

For an impressive list of features and specs, including our 30-day money-back guarantee, call 1-800-888-7744 Ext. 73. It's the only sensible thing to do.

The Portrait/15 Pivot is compatible with Macintosh-on-board video and popular Windows graphics cards.

Circle 89 on reader service card
Introducing the ScanMaker® III, the first 36-bit, single-pass, color flatbed scanner that's also the best value in the cosmos.

The ScanMaker III's 36-bit color scanning capability allows it to capture an astronomical 68 billion colors. It has an optical density that reaches 3.4, unprecedented for a flatbed scanner, which results in a vastly expanded dynamic range. What all this means is, that your scanned images will have smoother color gradations, denser color values and substantially increased detail in shadow and highlight areas.

Performing like scanners priced somewhere in the stratosphere, the ScanMaker III's scans are so sharp, you will actually reduce the amount of time spent in post-scanning software to sharpen images. And its optical resolution of 600 x 1200 dpi (enhanced through software to 2400 x 2400 dpi) is great for enlarging small originals.

For accurate scanned color, DCR™ (Dynamic Color Rendition), Microtek's award-winning color calibration/correction system calibrates the ScanMaker III to a photographic industry-accepted calibration target creating a custom profile of your specific scanner. This ensures the most accurate color possible as you scan an image, so you spend a lot less time adjusting the color of your scans to match your originals.

Windows users also get Microtek's ScanWizard™, a drag and drop application for instant image management, faxing and printing. The ScanMaker III also includes the full-version of Adobe Photoshop for complete image editing and color separations.

See why Microtek is the universally accepted leader in image quality. For more information about the ScanMaker III, DCR, ScanWizard, or for the name of your nearest authorized Microtek reseller, call 1-800-654-4160.

ScanMaker III shown with optional Transparent Media Adapter for scanning transparencies up to 8" x 10".

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Circle 287 on reader service card
Icon Mania 1.0

Icon Editing Utility

**PROS:** Simple interface; creates thumbnails from graphics files; good icon-creating tools.

**CONS:** No text tool.

**COMPANY:** Dubl-Click Software

**LIST PRICE:** $69.95

**MW** ★★★

**IC ON MANIA IS A DELIGHTFUL ICON-EDITING UTILITY THAT COMES WITH TERRIFIC TOOLS FOR BUILDING NEW ICONS, EVEN IF YOU HAVE NO ARTISTIC TALENT AT ALL.** Unlike some icon-creating programs, Icon Mania isn't a system extension or control panel; it's a small stand-alone application that makes editing batches of icons easy—and entertaining.

The program's main interface, consisting of three windows, is a model of clarity. The left window displays a library of custom icons; you can create your own libraries or dip into the 730 icons included with the program. The middle window shows the icons on any volumes currently mounted on your Mac. The window on the right is the pasteboard, a storage area where you can paste icons-in-progress or library items you access frequently. To apply an icon to a file, folder, or disk, you simply drag a custom icon—

from either the library or pasteboard—onto the icon you want replaced.

The icons that come with the program are outstanding; the majority are colorful, sophisticated, and well designed. (The icons look fine in black and white but are spectacular in color.) You can go wild with icons of space creatures, animals, bugs, Elvis, Ronald Reagan, and the Marx brothers. On a more practical note, there are colorful 3-D versions of popular application icons and folders as well as a set of sharp-looking icons representing floppy disks, hard drives, and removable media. Icon Mania also allows you to replace your default system icons with full-color, jazzed-up versions of folder, control panel, Trash Can, and alert icons.

But this isn't just an icon collection; it's an editor. Choosing the Edit command—or just double-clicking on an icon in the library or on the pasteboard—opens a window for modifying icons on a pixel-by-pixel basis. You can also create new icons from scratch. A row of Instant Tool buttons allows you to rotate, invert, and flip pieces of your icon designs with a single click. Still, a text tool would make it easier to add letters and numbers to icon designs.

Some of the program's icon-making commands are particularly noteworthy. First, the program lets you merge two different icons into a single new design using Paste Into Icon, a powerful command that enables you to take one icon and superimpose it within the boundaries of a second. Another outstanding feature is the Thumbnails command. Select a graphics file, choose Thumbnails, and Icon Mania builds a custom icon containing a thumbnail of the actual image contained in the file. The command produces great results and works with files in PICT, MacPaint, TIFF, GIF, PICS, EPS, and StartupScreen formats.

Icon Mania won't make you more productive, and it won't make your Mac more powerful. But after seeing how vibrantly Icon Mania can transform a window full of boring, generic folders, you may just decide you can't live without it.—JOSEPH SCHORR

PowerMerge 2.0

File-Synchronization Software

**PROS:** Better file- and conflict-handling; can compare and launch documents within PowerMerge; locates duplicate files; improved status information.

**CONS:** Can't schedule synchronizations.

**COMPANY:** Leader Technologies

**LIST PRICE:** $129.

**MW** ★★★

**POWERMERE IS ONE OF SEVERAL SYNCHRONIZATION PROGRAMS THAT HELP YOU KEEP INDIVIDUAL FILES, FOLDERS, OR ENTIRE VOLUMES ORGANIZED AND UP-TO-DATE.** PowerMerge 1.0.2 was a useful program (see Review, MacWorld, April 1993). Version 2.0 adds important new features.

Here's a typical scenario. Suppose I decide to work at home. I open PowerMerge on my Mac at work, locate the files I want to work on, and have PowerMerge copy them to a floppy. At home, I copy the files onto my Mac. I finish my work and return to the office Monday morning, deadline met. Now I want to replace the files on my workplace Mac with the new files. PowerMerge can look at both the floppy disk and the hard drive on my workplace Mac and can replace the old versions of files with the new versions.

That's synchronization at its simplest. But sometimes I just can't remember which file is my working copy and which file is a different version, an archival copy, or ready for the Trash Can. What's a gal to do?

Each time you open PowerMerge, it presents the preview screen. From this screen you can open files you're not sure about (without leaving PowerMerge) and take a look. If you've modified both desktop and floppy versions of a file, PowerMerge can do a text comparison—either automatically or by using a third-party product like DocoComp—or PowerMerge can open both copies and let you eyeball them, line by line. You can also rename files, trash superfluous copies, as well as set PowerMerge to copy new files (and tell it not to copy a particular file anymore). To help identify files, a status box at the bottom of the preview screen lists file types and creation/modification dates, and also shows how you've set up PowerMerge to deal with each file. You can choose to have PowerMerge display apparent duplicates at the top of the preview screen.

PowerMerge can also be used as a back-up program. You can lock the working volume, making it a one-way synchronization. You can designate—in the preview screen—the working volume as a master volume; again, the synchronization is one-way, but PowerMerge makes the contents of the backup, or slave, volume mirror the master volume, so you end up with an exact duplicate of the working volume. Lastly, for maximum flexibility you can select the two volumes and tinker with the settings each time you want to back up, especially if you want to keep several versions of a backup file or retrieve files from the backup volume without a full restore.

PowerMerge is a powerful file-management tool. If you're using 1.0, or have never tried synchronization software, check out PowerMerge 2.0. I see a lot of software, so when I not only install but also continue to use a program over a year later, I know it's a hit.—SUZANNE COURTEAU
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The convenience and dynamism is difficult to overstate.

Of course, many of the features offered by online services are available elsewhere, and the convenient access to them may be not be worth the price. Sure, it's neat to access the Official Airline Guide online, but why rack up charges to figure out the best pricing or to check seating availability when you can call a travel agent to do the same for free? You can send a letter to President Clinton by E-mail or the Postal Service, but either way it'll probably get minimal attention. And while you can read news and financial information online, doing so in large quantities gets expensive. If you really need that information for business purposes, your company should invest in more direct methods of providing it. Dow Jones's DowVision (609/520-4677) or Desktop Data's NewsEdge (617/890-0042, 800/255-3343).

If you're looking only for electronic mail and an Internet mail gateway, you can get an account on a service such as MCI Mail ($35 a year plus some per-message charges; 202/833-8474, 800/444-6243). If you want full Internet access, you won't get it on most of the services covered here; only Delphi offers full Internet access to its members.

Another function that online services offer is the ability to send files to other users in addition to E-mail. The catch is that the recipient must also have an account on the service—so if you regularly need to transfer files to someone on a particular service, it may make the most sense to own an account on that service (see "Connect Your LANS," in this issue). Most of the services covered here do not allow users to attach files sent through the Internet, although users wishing to send simple text may find that copying the text into a mail document is the easiest way to send it.

When choosing a service, you should consider its general feel, its offerings, interface, support for Macintosh users, Internet access, and costs.

The appeal of the large online services is that they offer a wide variety of databases, topical discussion groups, and resources—in other words, the electronic version of a shopping mall.

Core services include general, business, and sports news; computer forums and news; reference materials; electronic mail and bulletin boards; business statistics and data; games; shopping services; travel services; and educational reference material.

Still, the different online services do have different emphases, so even though they all offer a range of basic services, they are not interchangeable.

- America Online (AOL) Within the core feature set on AOL (703/448-8700, 800/827-6364) you can find the Library of Congress, Compton's Encyclopedia, news organizations like Cable News Network and Time, an extensive software library, stock quotes, sports news, a career center, a Macworld forum, American Airlines reservations, chat rooms, and special-interest areas including everything from a ham-radio club to an active gay and lesbian forum. AOL's emphasis is on information for home, recreational, and business users.

- CompuServe (CIS) Known for its vast wealth of databases and research-oriented services for financial, legal, and medical interests, CompuServe (614/457-0802, 800/848-8199) offers the core set of services, as well as Books in Print, computer vendor forums, brokerage services, Consumer Reports, Associated Press news, and the electronic edition of the Official Airline Guide.

- Delphi An Internet-oriented service, Delphi (617/491-3342, 800/695-4005) offers most core services, with its main omissions being vendor forums and graphical software. Delphi offers news from Reuters and United Press International; stock quotes; airline and car-rental reservations; the Computerized AIDS Information Network (CAIN); the Nynex Electronic Yellow Pages (covering businesses in the Northeast); Grolier's Encyclopedia; movie reviews; and computer vendor forums for a variety of platforms, including Macintosh.

Which of these five services is right for you?

by Joanna Pearlstein

Illustration by Mick Wiggins
By the time this article appears, Apple will have replaced its AppleLink service with its new online service, eWorld (408/996-1010, 800/775-4556) (see "Apple's Online Mall," News, Macworld, March 1994). At press time, eWorld was expected to launch in mid-June. A look at a prototype of the service revealed that its contents will be similar to those of other online services.

The core services that eWorld will provide include news from Reuters and USA Today, stock quotes, movie reviews, Grolier's Encyclopedia, a Living Well section, and a computer center. But with the service's software still in flux, it's too early to assess its potential success.

- **eWorld** Within eWorld's (301/340-4494, 800/638-9636) core areas, you can access stock quotes; Dow Jones News Retrieval; the Easy Sabre airline-reservation system; a GEnie mall; TRW business credit profiles; Grolier's Encyclopedia; forums for Macintosh developers and users; discussion areas; and a searchable database of articles from newspapers published in the United States, including the Los Angeles Times, Washington Post, and Chicago Tribune.

- **Prodigy** The core areas of the Prodigy Service (914/962-0310, 800/776-3449) let you use an encyclopedia, read news, go shopping, discuss computer problems, and get stock quotes. There are more kids on Prodigy than any other online service, and Prodigy's plentiful educational offerings include games, National Geographic adventures, and a Sesame Street area.

In recent years, Prodigy has come under fire for its policy of screening messages sent to message boards before posting them. Prodigy communications manager Deborah Borchert said if a message contains an obscenity or blatant bigotry or hate, the message will be returned to the sender. Borchert stressed that the screening is done only for message boards, not private e-mail.

**Mac Resources Compared**

America Online and CompuServe have by far the most Macintosh resources.

- **Vendor forums** Both AOL and CompuServe have lots of Mac vendors online, and those vendor forums are often good places to get technical support, exchange tips with other users, and download bug-fixes and new drivers. GEnie and Prodigy both have few Mac vendors online.

  At press time, eWorld had 25 vendors online, including Aladdin Systems, Deneba Software, Farallon Computing, Global Village Communication, and SuperMac Technology. Apple said eWorld will have 50 Macintosh vendors online at launch, and the company will provide tech support for its own products through eWorld.

  AOL and eWorld have a Mac-world forum, while the ZiffNet/Mac service (which includes MacUser and MacWeek forums) is available on CompuServe, Prodigy, and eWorld (extra fees apply on CompuServe and Prodigy). ZiffNet/Mac is also available as a separate service ($2.95 per month plus some connect fees; 617/252-5000, 800/666-0330). In all three publications' areas, readers get a chance to chat with editors, ask questions, exchange tips, and read selections from the magazines.

**Software libraries** Offering more than 50,000 Macintosh files, America Online has the best software library; CompuServe follows with over 20,000 files. Shareware fans may want an AOL membership just for its extensive shareware collection. It's easy to get technical support or software files on AOL, but CompuServe's sophisticated text-searching abilities give CompuServe the edge over America Online in finding specific information. CompuServe charges users the hourly rate for accessing its excellent Mac resources. (Although CompuServe's 9600-bps access costs twice as much per hour as 2400-bps, you should download at 9600 bps because it usually takes about one-fourth the time. But it's cheaper to browse, send mail, and post notes at 2400 bps.)

Prodigy is the only national online service that doesn't provide software-downloading capabilities. Instead, the service sells shareware kits, which cost around $40 and are mailed to customers. Prodigy says that users aren't paying for the software, but rather for the "duplicating and cataloguing service." But it's hard to determine what exactly is included in the shareware kits, since there's no index, and paying for them pretty much takes the fun out of try-before-you-buy shareware.

**Internet Access Still Limited**

The only national service that offers full Internet access is Delphi. At press time, America Online users could access Usenet newsgroups. Access to Gopher and WAIS (Wide Area Information Server) databases is expected in the future. GEnie users can access an Archie server, browse an Internet software library, read newsgroup files, and ask GEnie staff members to retrieve files from the Internet. Apple has promised eWorld Internet functionality in the future. (See the sidebar "How to Ride the Internet" for information about Internet terms and service providers.)

CompuServe offers no Internet functionality beyond simple mail, and the service charges 15 cents for each Internet message sent and received. While the service lets you decide whether to read (and therefore be charged for) a message, users with heavy Internet needs may find CompuServe too expensive.

But Prodigy users fare even worse: to send Internet mail on Prodigy, members must use a mail-manager program—which, at press time, was expected to be available for the Mac by the end of the year.
How Much Do Online Services Really Cost?

Because individuals' online usage varies widely, it's hard to characterize a service's costs in a single example. So, we chose three different scenarios (light, medium, and heavy use) to illustrate the wide range of fees an online user can incur. If you know how you would use an online service, the figures on the right will help you estimate your own costs.

Light use is a conservative estimate of online usage: 8 hours a month, 6 on-peak and 2 off-peak, all at 9600-bps. That includes no extended services and no Internet mail fees. (For Delphi we assumed the 10/4 plan.)

Medium use is a more generous estimate: 15 hours a month, 6 on-peak and 9 off-peak, with 3 hours of off-peak extended services and 10 Internet messages, all at 9600-bps. (For Delphi, we assumed the 20/20 plan and the $3 Internet fee.)

Heavy use is a very generous estimate: 15 hours a month of on-peak usage at 9600-bps (7 hours of extended services), 5 hours of off-peak usage at 9600-bps, and 30 Internet messages. (For Delphi we assumed the 20/20 plan and added the $9 hourly SprintNet charges that most people in the United States will incur during business hours.)

<table>
<thead>
<tr>
<th>SERVICE</th>
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<td>Price</td>
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<td>America Online</td>
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<td>Prodigy</td>
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*Actual on-peak hours vary by service, but they tend to represent normal business hours. Hourly rates for CompuServe apply only to extended services. You can access core areas for no hourly charge. It costs 15 cents to send or receive each Internet message. Delphi has two pricing plans: the 20/20 plan costs $20 for 20 hours of use, plus $1.50 per additional hour. The 10/4 plan costs $10 for 4 hours of use, plus $4 per additional hour. Access to Internet services costs $3. Most Delphi users pay a $9-per-hour SprintNet charge for on-peak use. Prodigy's hourly rates apply only when accessing extended services. The monthly fee includes 2 hours of access to those services.

of 1994. Today, Mac-using members can receive Internet mail, but not send it. Prodigy hopes to introduce full Internet access— including FTP, Gopher, and Telnet—later this year.

Some regional or special-interest services also offer Internet access. For example, one option is The WELL (Whole Earth 'Electron Link, 415/332-4335), a San Francisco Bay Area-based organization that has bulletin boards, a software library, and full access to the Internet. The WELL is popular with Bay Area residents, and its bulletin boards feature spirited discussions on political and social issues. But navigation is complicated, and accessing The WELL from outside Northern California is expensive.

Another online service is Women's WIRE (Worldwide Information Resource & Exchange; 415/615-8989, 800/210-9999), an Internet-providing bulletin board for women. WIRE is based on SoftArc's FirstClass, an excellent graphical bulletin board software product. WIRE contains information and discussion boards on a variety of topics, including news, health, arts, and technology. Organizations like the Boston Women's Health Book Collective and chapters of the National Organization for Women have folders on WIRE. Introduced earlier this year, Women's WIRE wound up to 650 members by the middle of March. Considering that more-traditional online services' members tend to be mostly men, women may find WIRE a welcome change. (To read about other BBSs, see The Desktop Critic, in this issue.)

Adding Up the Costs

The costs of online services vary widely, depending on access speed, time of day, and services used. Most services charge a regular rate for core services and charge additional fees for extended or premium services (see the chart "How Much Do Online Services Really Cost?).

AOL, cWorld, and GEnie have fixed hourly rates, while CompuServe and Prodigy charge an hourly fee only if you're using an extended area. In February, CompuServe cut its prices by 40 percent, significantly lowering its overall costs. Now, most of the good stuff on CompuServe costs you $4.80 or $9.60 an hour, depending on your access speed; for $8.95 a month, using only the core services is cheap, and accessing the extra services at 2400-bps is fairly reasonable. In contrast, cWorld's hourly rates apply at all times, so daytime users pay $7.90 an hour for access, regardless of connect speed. The true effect of this pricing structure may be that cWorld is one of the most expensive services around.

On Prodigy, accessing all but four areas costs nothing more than the monthly fee of $14.95. Users pay the hourly rate for accessing bulletin boards, stock quotes during trading hours, company news, and airline reservations. Prodigy is the only service that places advertisements on its screens, which may keep its costs low.

Delphi offers two payment plans. To get the best deal, you need to predict how many hours you're likely to use the service each month. Delphi's 10/4 plan costs $10 for 4 hours of monthly usage; the 20/20 plan costs $20 for the first 20 hours. Enrolling in Internet services (as most users will want to do) costs an additional $3 per month, Sprint's $9-an-hour phone charge applies during business hours. If you use Delphi in the evening, the price is right, but if you're a business user, the phone surcharges may make the cost prohibitive.
he Internet is a lot of things—President Bill Clinton and Vice President Al Gore's "data superhighway," a fast international post office, a file library, a bulletin board, a newsletter, a conference center, as well as a big database.

The Internet is a tremendous network of networks, connecting more than 1.7 million computers all over the world. Some are personal computers, and some are mainframes located at large educational, corporate, or government institutions. You can use the Internet to send electronic mail, access databases, retrieve files from all over the place, have conversations online, and participate in discussions on a variety of subjects.

Every person on the Internet has a unique user name, the components of which usually indicate the user's identity and the organization providing access. For example, the user name whoever@local.com shows the user's name, the service providing access (America Online), and the category of service. The .com in the Internet address above means the address is accessed through a commercial service. Other three-letter suffixes indicating the organization type are .gov (government), .mil (military), .edu (educational), .org (organization, usually used for nonprofits), and .net (network).

How do I get on? Types of Internet access vary. The most complete and expensive Internet access is dedicated access, requiring a phone line and a routing computer. Dedicated access is best for large institutions that have the money and resources to devote to Internet upkeep. If your organization has an Internet connection (as many corporations, government organizations, and schools do) but you don't have access, talk to your network administrator.

If you're an individual who wants Internet access, you can get an account on a commercial Internet service provider, like Netcom, or you can purchase a more direct account, called a SLIP (serial-line Internet protocol) or PPP (point-to-point protocol) account, also from an organization such as Netcom. An account from a commercial Internet service provider may cost between $15 and $50 a month; an account on Netcom could cost more than $100 a month. A dedicated connection (providing with the ultracool yourcompany.com suffix on your E-mail address) can cost thousands of dollars annually.

Using the Internet means using some Unix commands, but there are a few programs that provide easier Internet functionality for Macintosh users. One is Mosaic, a free product from the University of Illinois's National Center for Supercomputing Applications. But you can't use these products unless you have a SLIP, PPP, or more direct dial-in account.

Spry Inc. is working with book publisher O'Reilly & Associates on a product called Internet in a Box, which will provide users with graphical Internet applications, an opportunity for an Internet account on NovX InterServ, and a special edition of Ed Krol's The Whole Internet User's Guide and Catalog. (see "Internet in a Box . . . . News", July 1994). A Mac version of the product is expected later this year, and will cost about $100.

Ventana Media offers a similar product, the $70 Internet Membership Kit (919/942-0220), providing two books and access via CELLnet.

Sending mail To send mail to someone on a commercial online service over the Internet, you need to append routing information to the person's E-mail address. For example, a CompuServe user's Internet E-mail address is username@compserv.com (CompuServe's user names include a comma, which you should replace with a period, such substitutions are not needed for other services).

Some businesses set up Internet mail gateways through office E-mail systems; these addresses can get quite complicated, and it's best to have the user E-mail you first so you can just copy the address into a macro or address book.

Users with Internet access can usually send files to others on the Internet, receiving those files usually means dealing with your telecommunications software's file-transfer protocols (see "Pick the Right Communications Software," elsewhere in this issue).

To cut down on connect time, you can use the Eudora Internet mail program. If you have a SLIP or PPP account, a free version is available on the Internet, and Qualcomm (619/587-1121) sells a version with more features for $50.

File transfer Internet also lets you transfer files using various commands. In Internet lingo, you use FTP—it stands for File Transfer Protocol, and it's used both to identify the protocol and to indicate using the protocol. You can log in to an FTP site, browse files, and download them, which involves transferring them first to your Internet account and then to your own computer. You don't need your own account at the FTP site; many let you use anonymous as your user name and your E-mail address as a password. Because some Internet service providers charge users for disk space, FTP may involve extra costs if you transfer large files.

You can FTP via telecommunications software, or try an FTP-specific program like Fetch, written by Jim Matthew of Dartmouth College. The program is free to noncommercial users, and costs $25 for commercial folks. (For information, send E-mail to fetch@dartmouth.edu.)

FTP files are usually free. You can FTP files from Apple, the National Institutes of Health, the Internet Network Information Center, the National Science Foundation, and various literary archives, just to name a few—there are thousands of FTP sites.

Don't know where to find a file you want? Archie will tell you. Archie puts a list of FTP files into one database on a server, and lets you search for files easily. There are Archie servers all over, and you can access them via E-mail. Telnet (explained later), and on Genie and Delphi.

Similar to FTP, Gopher lets you find and retrieve remote files. But unlike FTP, Gopher
connects to the host site only to retrieve menus of information and disconnects for browsing, whereas FTP remains connected the entire time. One Mac Gopher program is the University of Minnesota’s TurboGopher (free from several servers), which acts as a client to Gopher servers. The Archie of Gopher is called Veronica. Veronica is an index of Gopher archives and can be reached on Gopher servers.

Remote Log-In The Telnet command lets you log in to another machine remotely. You might log in to a remote computer to search a database or log in to another account on the Internet. Telnet is particularly helpful if you have an account in another city, because you can log in remotely to save phone charges.

Newsgroups Usenet (also called Net News) collects received messages or articles on a particular subject and sends them to a mailing list. There are lists for every topic under the sun.

File searching WAIS (Wide Area Information Server) lets you search files based on content, giving commands as colloquial as “tell me about AIDS treatments.” You can use Telnet to connect to a WAIS or log in to one directly using WAIS client software.

Service providers If you send E-mail to the following addresses of a cross section of Internet service providers, you’ll receive a reply with information about pricing, availability, and connection instructions.

Among nationally available providers are Advanced Networks and Services (313/663-7610, info@ans.net). Delphi (617/491-3342, 800/695-4005; info@delphi.com) and Netcom On-Line Communications Services (408/554-8649, info@netcom.com).

Among regional providers are Colorado SuperNet (303/273-3671, info@csn.org). Holonet (510/204-0160, info@holonet.net) in the San Francisco area, and The World (617/739-0202, info@world.std.com) in the Boston area.

Resources Because the Internet is sprawling and largely unmanaged, it’s hard to get a handle on how to use it effectively. Fortunately, there are some good resources to help you navigate it. One of the best is the Internet Network Information Center (619/655-4600, 800/666-6345). Your local user group may offer Internet access.

Your local bookstore may have lots of books on the subject. My three favorites are Bernard Aboba’s The Online User’s Encyclopedia ($32.95, 1993, Addison-Wesley Publishing Company, 617/944-3700, 800/822-6399), Adam C. Engst’s The Internet Starter Kit for the Mac ($29.95, 1993, Hayden Books, 317/581-3500, 800/428-5331), and Ed Krol’s The Whole Internet User’s Guide and Catalog ($24.95, 1992, O’Reilly & Associates, 707/829-0515, 800/988-9938). Aboba’s is best for information about all things telecom, while Engst’s comes with several pieces of TCP software. Krol’s book has fewer lists but remains an excellent resource.

Interface Issues
When you do join a service, you’re adopting a culture, and it can take a while to get acclimated.

America Online AOL feels like a Mac environment, from the menu and icon-driven interface to the friendly voice that announces “You’ve got mail.”

America Online recently added more E-mail functionality, so that members can now mark already read mail as unread so it remains in the box, as it were, and can resend mail already sent to AOL users. eWorld has some of the same abilities, but AOL’s prices give it a significant edge.

AOL looks and behaves like a Macintosh program should. Each area has a designated keyword, and getting around is as easy as typing #~K and then the keyword. But while getting to an area is easy, getting around it isn’t—arrow keys work for navigating some things, but sometimes there’s no alternative to clicking on buttons.

Another problem with American Online is its inability to search message boards based on content, or to do threading (navigating through related topics). You can read only messages posted since you last visited the area or in the last x number of days. If you want to read everything, that’s great, but if you just want to find an answer to your question, patience is helpful. Having to read entire blocks of messages also increases the cost of AOL, since you spend more time looking for what you want than you would if you could search for it by keyword.

Earlier this year, AOL users experienced problems with logging on and slow performance, and those connection problems continued for some users in large U.S. cities in late May, partially because of problems with Sprint, a company providing local access numbers. Pam McGraw, spokesperson for America Online, said there are isolated instances where subscribers are experiencing difficulties at the local-access level. “We’re continuing to work to resolve those issues,” McGraw said. The service’s checkered history does not inspire confidence. Still, AOL’s friendly organization makes adjusting to the service fairly easy.

CompuServe CompuServe looks and feels huge, and it can be reached through either of two graphical software packages: CompuServe Information Manager (CIM) and CompuServe Navigator. Users can also access CompuServe in text-only format from any standard telecommunications program, but unless you’re a masochist, there’s no real reason to do so, since CIM comes with CompuServe’s $39.95 starter kit. CIM version 2.3 provides a Microsoft Word-like tool bar for frequently accessed functions like mail, searches, weather, Go words (the commands to move to a specific part of the service), and connecting. CIM also provides a “favorite places” list that makes for easy navigating.

But CIM’s keyboard equivalents are also limited—the Find command isn’t even assigned to the Mac’s standard #F. Not all of CompuServe’s areas support a graphical interface, and CIM is smart enough to switch to a textual interface when necessary. However, switching between CIM’s terminal emulator and the graphics software can be confusing.

The other graphical navigation option, Navigator, is a complex program whose main purpose is to retrieve information to be read offline. Users can tell Navigator to log in to CompuServe, get mail, read particular message boards, search software libraries, and log off. The user can then read the Navigator log, which contains the information that Navigator retrieved, without incurring access fees while reading. Navigator is far
MACWORLD'S GUIDE TO ONLINE SERVICES

more sophisticated than any other online-service software I have seen, and while it is expensive ($50 to $70, depending on current CompuServe specials), a serious CompuServe user won't want to be without it.

Despite its sometimes awkward graphical interface, CompuServe excels in its ability to search data. CompuServe's search options include location, text string, and date, making it very easy to find what you want. Searching for information about bugs in your new software? Just type bug and select the vendor forum and the appropriate date, and CompuServe shows you all the relevant messages. You can also hit a map button that displays a hierarchy of messages and their authors.

**Delphi** I found Delphi easier to navigate than any other text-based service I've used. Delphi is organized by menus, and a user can type the first few letters of an item to select it. Unlike other services, where commands differ depending on the part of the service you're using, Delphi responds to logical commands, and online help is easy to find.

Like CompuServe, Delphi can follow messages according to topic, but unlike with CompuServe, you can't search areas for keywords or dates. Reading Delphi message boards can take some getting used to, but the information tends to be useful. If you can't live without a pretty interface, Delphi isn't for you.

**eWorld** Built with software from America Online, eWorld looks and feels very much like AOL but with reorganized menus and different fonts. As in AOL, getting around eWorld can be a pain, since users often have to click through several screens to get to their destination. eWorld's graphics are rich and colorful, but as a result the software takes up over 3MB of disk space—almost twice as much space as other services' software. eWorld will eventually replace AppleLink, and since Apple plans to make eWorld software a part of every Mac-and-hard-drive bundle it sells (starting no later than July), the service's membership may grow quickly. For eWorld, the test will be not how many people get memberships, but how many people keep them.

**GEnie** While GEnie offers good information, it's an ASCII-based service—the introduction of long-promised graphical software has been delayed repeatedly. Because GEnie is text-based, you can access it from any telecommunications program.

GEnie's organizational metaphor is a book, and areas are located on particular pages. To move to a certain area, a user types a forum name or, in some cases, Move page number. Within areas, topics are organized by categories, and navigating the categories is sometimes difficult. Members can't search message boards by content; as with America Online, GEnie users can select messages based only on criteria such as posting date.

**Prodigy** The Prodigy online service is fairly easy to navigate: a toolbar at the bottom of the Prodigy screen lets you get to the main menu quickly. Prodigy uses “Jump” words that are equivalent to AOL's keywords and CompuServe's Go commands. Unfortunately, like AOL and GEnie, Prodigy can't do message-threading.

While navigation is mostly simple, accessing Prodigy from a Macintosh is a pain. The Mac version of Prodigy has an atrocious interface. For example, because Prodigy uses enormous screen fonts, users often have to move through several screens to read an entire message, and there is no cut-and-paste.

This August, Prodigy expects to ship a new version of Mac software. I looked at a beta version of it that allows access to other applications and offers cut-and-paste capabilities, but still doesn't follow basic Mac software-design guidelines. Prodigy representatives said that they just didn't feel it was worth the effort to create a Mac interface.

**What's Right for You**

Commercial online services offer hundreds of services, and it's unlikely that you'll want—or use—all of them. In picking an online service, consider what you'll use it for most. If you want access to particular computer vendors, first determine whether they have their own bulletin-board system (their manuals usually tell you). Your local user group may also have a BBS that provides technical support and Internet access. (To find a local user group, call Apple's user-group hotline at 800/538-9696, ext. 500.) America Online and CompuServe have the most Mac vendors online. All services are good sources of news and financial information, and America Online's E-mail is cheap, easy-to-use, and reliable.

If you are having trouble deciding between services, see the reviews and news sections of the magazine.

**ONLINE SERVICES**

<table>
<thead>
<tr>
<th>Online Service</th>
<th>To pick the top online services, we gave the most weight to the breadth and depth of information, with emphasis on a Macintosh owner's needs, followed by price and ease of use.</th>
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<tr>
<td><strong>America Online</strong></td>
<td>Relatively cheap and easy to navigate. America Online is the best choice for E-mail users. Company: America Online. Basic monthly fee: $9.95.</td>
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**REFERENCE**

JOANNA PEARLSTEIN, a Macworld assistant editor, is a frequent contributor to the reviews and news sections of the magazine.
Introducing a printer for those who have ideas bigger than this page.

The HP DesignJet 650C/PS printer. Large-format at a small price.

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You never thought you'd
BUT YOU WILL.
AND THE ODDS ARE YOU'LL LOSE YOUR DATA, TOO.

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THE NUMBER ONE BACKUP SOFTWARE FOR THE MACINTOSH. We’re not talking about some after-the-fact recovery utility that sends you digging through the trash and sifting through the scraps. But rather, full-blown, 100% seamless restoration. Something you'll definitely want when the data really hits the fan. With automatic backups, point-and-click operation, unparalleled performance, total support of every type of storage device, and ridiculously simplified network operation.

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What have you got to lose?
SO YOU BOUGHT A HIGH-SPEED MODEM, ONE OF THOSE 14,400-bps items that are so cheap nowadays, and logged some time on simple communications: faxing friends, dabbling with the America Online trial package, and looking at Dow Jones quotes for stock you’ll never buy. Now you’re eager to do some real work—

Pick the Right Communications Software

telecommute from home to the office mainframe or set up a customer-support BBS for the service department. Plus, with this speedy modem now fully operational, you’re just dying to try out that precursor to the information superhighway, the Internet.

Your modem gives you easy access to all of these: bulletin boards by the thousands, commercial information services, mainframes and minicomputers, and gateways to the Internet. As with all of life’s journeys, you need to equip yourself for the trip, which means choosing the right software. The choices you make depend on how far you want to travel and what you want to see along the way. You have to weigh features such as protocols, terminal emulations, file-transfer support, and scripting capabilities. If your communications needs are limited to online services, such as America Online or CompuServe, you can probably get by with the software that came with your modem (see “Macworld’s Guide to Online Services,” elsewhere in this issue). But if you want to communicate with the rest of the world, you need more. The following guided tour surveys the most popular Mac communications packages, helping you pick a package that matches your budget and digital itinerary.

Zimply Ezzential
Bulletin board systems (BBSs) are like the swap meets of the global village: people of like interests meet to exchange war stories, advice, and tangible goods. You can find a BBS for virtually every special interest, from aviation to zoology. You can even set up your own BBS for others to access; all you need is a modem and BBS host software.

Accessing most BBSs requires only a simple terminal emulator with file-transfer capabilities for uploading and downloading files. One inexpensive product fills this role perfectly: ZTerm. This $30 shareware gem by David P. Alverson (5635 Cross Creek Ct., Mason, OH 45040-2448; CompuServe: 72155,1560) is a well-outfitted, finely crafted terminal emulator for exploring the vast network of BBSs that now stretches across North America (see “Two Bulletin Board Systems”). You can download ZTerm from any major online service and many BBSs, or for an extra $10 get the latest version on disk directly from the author (mail orders only—no phone calls, please). ZTerm supports communication speeds up to 57,600 bps, to take full advantage of the compression capabilities of high-speed modems; VT100 and PC-ANSI terminal emulation (used by most BBSs); automatic log-in for one-step dialing and sign-on; keyboard macros; and a reasonable suite of file-transfer protocols. A wide range of file-transfer protocols is one of the most important requirements in a program designed for BBS hopping, because not every BBS supports every protocol. ZTerm supports Xmodem and Ymodem protocols in all their variations, as well as the currently popular (and fast) Zmodem. ZTerm also supports the CompuServe B-Plus and Quick-B protocols, which give the fastest file-transfer performance possible with CompuServe’s online service—important when you’re using the extended services and paying connect charges by the minute. ZTerm’s Queue Dialing command lets you repeatedly dial a list of BBSs to connect to the first one that becomes free. ZTerm also lets you transfer files in the background while you use other applications, albeit with lower file-transfer throughput.

ZTerm is a great low-cost tool for BBS work and Mac-to-Mac file transfers, but it has its limits. While it supports color text, it can’t send and receive graphics, and its interface is non-graphical. ZTerm’s scripting is simple and limited to automating log-on and log-off, and ZTerm provides no support for multiple sessions. Even so, ZTerm should be in your travel kit even if you eventually opt for something more expensive.

The Scenic Route
Although most BBSs use primitive character-based terminal emulators, a growing number of systems now offer a graphical user interface (GUI) that gives them a Mac-like look and feel. Two products, both shareware, open your Mac to the world of GUI BBSs: FirstClass, from SoftArc (416/299-4723), and Tele-
Finder Pro, from Spider Island Software (714/669-9260). Currently, FirstClass has more than 500 BBS sites in existence; TeleFinder has about 100. Both products consist of two parts: server software that runs on the actual BBS host system ($95 for FirstClass, $425 for TeleFinder), and client software that a caller uses to connect to the BBS. SoftArc and Spider Island make their money selling the server piece to BBS operators, which is why the client piece is distributed for free (or nearly so) to users through online services and BBSs.

Both products support file archives, discussion boards, real-time conference areas, and gateways to other systems and networks, all of which are represented by icons. In this way they are similar to the graphical front ends for CompuServe and AOL. The critical difference is that you can connect to a wide range of BBSs rather than a single commercial service. Which product you choose depends on which BBSs you want to use; you must use client software that matches the server software.

In both programs you can open multiple windows to access several online services at once. FirstClass offers a purely modeless interface, meaning you can do any number of things at the same time (see “Two Bulletin Board Systems”). For example, you could be downloading one or more files while simultaneously browsing a message base and monitoring a real-time conference. With TeleFinder you can do only one online thing at a time. Both products let you use other Mac applications while downloading files in the background. TeleFinder's interface mimics the Mac Finder, with icons for both disk volumes and online services sitting on a desktop—an arrangement that some people find confusing. FirstClass organizes its icons in windows without changing your desktop's appearance.

The FirstClass and TeleFinder server components turn your Mac into a complete BBS. The price of server software depends on the number of simultaneous users you want to support—anywhere from a few hundred dollars to $1000 or more. Many Mac vendors and user groups use FirstClass or TeleFinder for customer-support BBSs.

Road Warriors

Sometimes you may want the Mac to run routine online chores automatically. Perhaps you need to retrieve your E-mail from an online service at regular intervals throughout the day, or transfer large files at night when phone rates are lower, or collect hourly stock quotes to import into a spreadsheet. Such tasks require scripts that tell the communications software what to do and when to do it. For scripting capability, you need to step up to the next level of communications software.

The Mac market is replete with scriptable comm programs, but a few stand out for their combination of simplicity, power, and value: Crosstalk for Macintosh ($195, Digital Communications Associates, 404/442-4000), MicroPhone II and MicroPhone Pro for the Macintosh ($195 and $295, respectively, Software Ventures Corporation, 510/644-3232), SmartCom II ($149, Hayes Microcomputer Products, 404/441-1617), and VersaTerm ($125, Synergy Software, 215/779-0522).

For the price, VersaTerm is hard to beat. You can create scripts automatically by having VersaTerm observe your actions and record them for later playback. VersaTerm supports Xmodem and Zmodem file-transfer protocols, but strangely, not Ymodem, an omission that doesn't rule out file transfers to a given service, but does mean slower transfers. If you connect with Unix systems, you'll be glad for VersaTerm's Kermit and

A growing number of BBSs now offer a graphical user interface
How to Buy a Modem

A modem is the most cost-effective enhancement you can buy for your Mac system. If your work requires current financial, legal, or medical information, your modem can actually be your main justification for owning a computer. But even if you only download software occasionally through national online services such as America Online and CompuServe, your modem will quickly pay for itself. And a fax modem lets you avoid paper-based clutter and the ridiculous intermediate step of printing a computer document before sending it to someone else’s computer. And as faster modems make transmission times negligible, even for large documents, telecommuting becomes possible for a wider range of jobs. A modem now makes sense for almost every Macintosh user, so the real question is: how much speed do you need to buy, and for what price?

Buying a modem is more confusing than adding memory or a new printer. Manuals for modems tend to feature cable-connect pinouts, timing diagrams, arcane CCITT jargon, and tables of the time-honored Hayes AT commands. If you have to deal with modem communications at this level, you’ll wish you had an electrical engineering degree. Here’s some advice on buying a modem and on choosing software that lets you dodge most of the technicalities of modem set-up and operation.

The Works

A modem’s job is really fairly simple: it takes the digital output from your files or your keyboard and transmits it via telephone lines as a pattern of tones (a fax modem scans a document and translates the light and dark patterns into tones that it then transmits across the lines). The circuits that do this conversion have only one or two chips, so the price of modems falls steadily.

Let’s review the options for modem hardware currently available. Then I’ll make some buying recommendations.

Five Ways to Go

OLD, SLOW, AND CHEAP There are millions of old 1200-bps modems floating around, and it’s often possible to coax someone into giving you an old unit. Don’t buy one, though.

FASTER BUT STILL CHEAP Many vendors offer plain old 2400-bps modems (no fax capability) for basic communications; and these modems can often be found bundled with introductory offers for subscriptions to national online services.

BASIC FAX Standard fax modems, offering 9600-bps fax and 2400-bps data communications, are available at street prices ranging from $100 to $160. Some offer extra amenities. the Home Office 144e ($269 list price) from Prometheus Products, for example, includes a voice-messaging system, and it works with your phone over a single phone line, instead of requiring a dedicated line for fax transmission.

Apple bundles the Global Village TelePort/Bronze fax modem with midrange Performa models. If you are thinking of buying a new Mac, this is a way to get a fax modem at a good price and to avoid set-up hassles, as the included software handles the details.

RIGHT HERE, RIGHT NOW If you regularly telecommute or download remote database data, you need a fax modem that offers 9600-bps data transmission and 9600-bps fax, such as Global Village Communication’s TelePort/Silver and PowerPort/Silver.

Modems that transmit data at 14,400 bps and also have 14,400-bps fax send/receive capability are beginning to supplant 9600-bps modems. The SupraFaxModem 144LC, selling for $189.95, for example, includes V.42bis compression, permitting E-mail throughput at 57,600 bps. At this price, it’s hard to make a case for a slower modem, at least for users who connect for more than an hour a day.

CompuServe now has 14,400-bps dial-up numbers in large cities, and other services will follow soon. The 14,400-bps speed itself will be old news in a year or so, but right now there are few services that accommodate faster standards.

MODEMS ON THE MOVE Very small portable external modems (pocket modems) are popular for 14,400-bps data transfer. This standard is not as widely accepted by modem vendors.

Different Names for Fast

V.32 A communications standard used for most popular 9600-bps data transfer.

V.32BIS A communications standard generally used for 14,400-bps (14.4-Kbps) modems.

V.29 The most widely accepted standard for 9600-bps fax transmission. Since this speed is typical of millions of stand-alone fax machines.

V.29 will be around for a few years.

V.17 The standard for 14.4-Kbps data transfer, emerging as the most popular choice in computer-to-computer faxes.
TCP/IP FTP protocol support. Terminal emulations include DEC VT100 and VT220, Tektronix Tek4014, and Data General D200, along with keyboard layouts for DEC, IBM, DG, and Unix systems. You can use these emulations to exchange E-mail and data with your corporate mainframe. VersaTerm supports multiple simultaneous connections over serial lines (with several modems) or via AppleTalk or TCP/IP networks. A server feature lets VersaTerm users on an AppleTalk network access other networks through a gateway Mac. The emulation is fast, able to keep up even on high-speed connections. Inconveniently, however, VersaTerm lets you view only one network connection at a time, even when several are active.

While VersaTerm’s recording feature simplifies script creation, the script language itself is cryptic; its special characters can create button palettes to let users invoke scripts with a single mouse-click. In addition to better scripting, MicroPhone II supports Zmodem and CompuServe Quick-B file-transfer protocols, and VT320 and PC-ANSI terminal emulations, none of which VersaTerm handles. For $100 more, MicroPhone Pro adds TCP/IP Telnet, FTP, and Usenet news client programs and fax send-and-receive software. But buy only the features you need.

At $195, the same price as MicroPhone II, Crosstalk offers more-powerful, although more-complex, scripting, and a more inclusive set of terminal emulations and file-transfer protocols than either MicroPhone or VersaTerm. For terminal emulations, Crosstalk adds IBM FFTERM and 3101, HP 700/94, VIDTEX, WYSE, ADDS, and PCTERM. Crosstalk is also the only Mac terminal emulator that speaks the arcane INDSFILE file-transfer protocol used by IBM’s IBMLink mainframe network. Crosstalk’s scripting is more robust than VersaTerm’s but harder to use than MicroPhone’s; the package also includes a huge array of script files preconfigured for online services, making good use of an elaborate button palette.

SmartCom II is another specialist’s tool. It works extremely well with Hayes modems (not surprising, since Hayes developed it). Its terminal-emulation and file-transfer capabilities match those of MicroPhone II, but the scripting in version 4.0A is icon based rather than text based. The program comes preconfigured for virtually every Hayes modem ever made (with free updates whenever new ones hit the market). If you have a Hayes modem, SmartCom II gets you connected in a snap, though you’ll have to live with its limited scripting. If you have a Hayes-compatible modem, SmartCom II provides support for several vendors and dozens of models.

Internet Interstate

The Internet global network is a precursor to the anticipated information superhighway that promises to connect everyone to everyone, just as soon as we all get fiber-optic phone service and digital doorbells.

One way to connect to the Net is to use the basic terminal emulator to dial in to an Internet-connected Unix system. (All of the packages described so far are fine for this.) You then type arcane Unix commands such as ftp, whois, and ping to talk with other computers on the Net. A better Internet connection is something called SLIP (serial-line Internet protocol): you use a SLIP dial-up program to dial in to an Internet gateway and establish a local area network (LAN) interface. Gateways are fee-based services costing between $1 and $4 per hour. A SLIP connection gives your Mac a LAN presence on the Net, just as Apple Remote Access gives you an AppleTalk presence on a Mac network. However, SLIP uses the TCP/IP protocol instead of AppleTalk, so you need Apple’s MacTCP extension in addition to a SLIP connection program.

Two popular SLIP products for the Macintosh are Versatilities ($95, Synergy Software, 215/779-0522) and TCP/Toolz & Toyz ($149, InterCon Systems Corporation, 703/709-5300). Both contain all the Internet connectivity components you need to get started: MacTCP; a SLIP connection tool; and clients for Telnet terminal emulation, NetNews, E-mail, directory services, and FTP file transfer. Versatilities is bundled with VersaTerm, making that package a real communications bargain for Mac Net surfers. A subset of InterCon’s tools is included in Adam Engst’s book-and-disk combo, The Internet Starter Kit for Macintosh ($29.95, 1993, Hayden Books, 317/581-3500). The book provides a nice introduction to the Internet; you’ll find it useful no matter what SLIP product you ultimately use to tie into the Net.

Once connected via SLIP, your Mac acts as if it were connected over a 100-gigabit-per-second optical cable, only not as fast. Your Mac acts as a full-fledged network, and you can run any number of TCP client programs simultaneously. Client programs let you access services provided (for free) by the many far-flung host systems through-
COMMUNICATIONS SOFTWARE

out the Net—including colleges, libraries, research institutions, software companies, and governments. Typical client programs include Telnet for terminal emulation, FTP for file transfer, and NetNews for browsing the eclectic newsgroup discussions for which the Net is famous. Some client programs, such as the freeware MacMosaic, combine several client functions with hypertext, graphics, movies, and sound to make navigating the Net easier than ever, if no less exhausting.

By the time you read this, at least one other Internet start-up package should be on the market: Internet in a Box (a joint venture of Spry Inc. and O'Reilly & Associates, 707/829-0515, $149). This book-and-disk combination plate includes a number of advanced Internet client software programs, MacMosaic among them, and a subscription to O'Reilly's Mosaic server called Global Network Navigator, which provides a central source for Macintosh Internet news as well as updated software and various network-navigation tools.

Other Horizons

Beyond communicating with online services, BBSs, and the Internet, you can use your modem to perform a number of specialty communication chores, such as LAN access, remote Mac and PC control, pager notification, and information services.

The most popular remote LAN access software for the Mac is Apple Remote Access (ARA), a two-part system that lets you connect your Mac to an AppleTalk LAN over a phone line by calling one of the Macs on the LAN. Originally included with PowerBook systems, ARA is now a separate purchase item from Apple. ARA MultiPort Server ($249, Apple Computer, 408/996-1010) runs on the LAN-attached Mac; ARA Client ($129) runs on the remote Mac (and comes bundled with the new 500 series PowerBooks). On the road you use ARA Client to call your server Mac and establish a LAN connection. You then can mount volumes and share programs and data as if you were locally attached to the LAN, the only difference being considerably slower access speed.

Sometimes you want more than just remote access to a LAN—you want to remotely control another computer completely, to provide technical support or operate unattended equipment. Timbuktu Pro ($199, Farallon Computing, 510/814-5000) lets you dial into a remote Mac or Windows computer and observe a verbatim copy of the computer's desktop. You can then manipulate files and launch programs, just as if you were working onsite. You run Timbuktu on both machines, and either establish a dedicated Timbuktu modem connection or use an existing ARA or other network connection. In fact, Timbuktu's connection features are so versatile that you could operate a remote Mac through the Internet, using an Internet-connected TCP/IP LAN, or by dialing into an Internet provider using SLIP. Timbuktu's file-transfer capabilities and support for Apple's PowerTalk mail extensions make it a nice all-around telecommuting package.

Want to give your computer the power to reach out and touch someone? Try Notify ($149, Ex Machina, 718/963-0309), which lets your Mac dial paging services to send wireless messages. Notify works with alphanumeric, numeric, and tone-only pagers, using your modem to send either data or touch-tones to the pager's dial-up line. You simply select a person to notify from a directory, enter a message, and Notify dials the paging service to transmit the message.

A number of specialty information services use dial-up connections to deliver news digests, stock quotes, and E-mail. One such service is Motorola's EM-BARC (Electronic Mail Broadcast to a Roaming Computer; $395 plus subscription fees, Motorola, 407/364-3151). EM-BARC delivers E-mail, news, and financial information over its pager-size NewsStream radio receiver that you connect to your computer like a modem. The receiver collects messages into its own onboard memory, which you later download into your computer. To send outgoing E-mail, EM-BARC dials up a host machine using a regular modem and telephone line. The package includes the NewsStream receiver and special software; you must also pay monthly subscription fees and per-message charges.

End of the Line

With modem speeds at an all-time high and modem prices at an all-time low, participating in the online global village is easier and cheaper than ever. But don't make the mistake of buying the most expensive comm software available, thinking that you'll cover all the bases. No single package meets every need. If you're new to online communications, get your feet wet with services such as America Online and CompuServe, which provide one-stop shopping for such basic services as E-mail, discussion groups, and file archives. You can then advance to BBS exploration and perhaps mainframe access. Eventually you'll want to get on the Internet, if only to see what all the racket is about.
Before you consider a third party external drive, look at what we've brought to the party.

Introducing Apple® External Hard Drives. Now you can add reliable external storage to your Mac with all the quality you expect from Apple, at prices that will surprise you.

Apple External Hard Drives are bundled with everything you need to begin safely storing your data right away, including a power cable, a SCSI cable, and a terminator. Convenient front-panel SCSI ID and power controls make it easy to power up and change your SCSI address — whether you set the drive up vertically or horizontally.

The new Apple drives are available in four convenient storage capacities, 160Mb, 230Mb, 500Mb and 1000Mb, and are manufactured exclusively by La Cie, ltd. a Quantum Company. And right now we're celebrating the Apple Drive debut by loading each drive with powerful hard disk management software, handy utilities and much more. Look for the Apple Drive at your local dealer soon. For more information and the name of a participating reseller or Quantum distributor, call La Cie.

Now you can safely store your work outside your Mac without leaving the Apple family. That's cause for celebration. Apple

FOR ALL THE FACTS CALL: 800-999-0499

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Circle 51 on reader service card
It may sound like a party, but the benefits are far more substantial. You see, FileMaker® Pro Server lets you and your entire workgroup do more, more quickly. (Not a bad thing to celebrate.)

Maybe your company's expanding, where more users will need to access files simultaneously. Or perhaps you're looking for more power to speed existing operations. FileMaker Pro Server is here, at your service. It's a high performance database engine, designed to dramatically accelerate multi-user file sharing over your network. In fact, its sophisticated client/server technology can speed database performance by up to 100 percent over FileMaker Pro 2.1, and increase multi-user file access from 25 to 100 simultaneous users per file.

Connecting FileMaker Pro Server to your existing network is simple. It can support both Macintosh and Windows users. And while it's compatible with standard Mac systems, including Centris and Quadra, it's also accelerated (native) for Apple's new Power Macintosh systems.

Due to its simple plug and play design, the Server can be run by anyone in your organization, not just network administrators or those with database experience. To begin sharing files, simply take any FileMaker Pro file off a desktop machine and drop it on the Server. You needn't worry about modifications or upgrades. It's all in one box.
Comprehensive, graphical administration features ensure that the administrator can quickly and easily monitor file-sharing over the entire network, as well as Server performance.

You might be wondering if FileMaker Pro Server can stand up to the daily rigors of your business. Rest assured. We’ve already put the product through our own torture chamber: the Claris® Testing Lab. We experimented with a range of Mac and Windows computer models, running them in a wide array of network and file configurations—up to 100 computers at a time. We ran tests and made refinements for a full six months. So as more and more of you become networked together, you’ll find fewer clock and coffee cup icons on your screens.

So come on! Grab a FileMaker Pro Server and get the whole gang working more productively! It’ll definitely be more satisfying than the company picnic. (Sorry, onion dip and chips not included.)

You can get FileMaker Pro Server now from software resellers all over the world. If you’d like the name and address of the dealer nearest you, call Claris Customer Assistance at 1-800-3CLARIS.

Simply powerful software.
The best printers include (from top to bottom) the Tektronix Phaser 3001, the Tektronix Phaser 220e, and the Hewlett-Packard DeskWriter 560C.
COLOR PRINTERS
FOR EVERY BUDGET

Macworld Lab tests 16 ink-jet and thermal-wax printers

by Jim Heid

Still procrastinating over making the leap to color printing? You may be running out of excuses: printer manufacturers keep discovering better, faster ways to apply pigments and render images, and for less money.

The latest color machines still aren't about to replace monochrome printers—regardless of how it works, a color printer is slower, more expensive, more complex, and more finicky about paper than its monochrome equivalent. But for business presentation materials, for page proofs, and for any applications beyond gray-scale, this is a good time to follow the rainbow.

Or, more accurately, rainbows: each of the several color-printing technologies offers its own strengths and financial requirements. Liquid ink-jet printers span the price spectrum, ranging from $379 to over $10,000 (see “Finding the Best Business Color”). Half the printers, however, are low-end machines priced at well under $1000. These are best for simple applications such as printing color presentations and jazzing up reports with colored graphs and spot color.

Solid ink-jet machines, priced between $5595 and $9995, are popular among publishers, thanks largely to an ability to print on nearly any kind of paper. Thermal-wax printers have become the mainstays for business color printing, generally offering better output quality and faster performance than ink-jets can. Prices for thermal-wax machines have fallen into the monochrome laser territory, ranging from $995 to $8999.

For this survey, Macworld Lab tested 16 ink-jet and thermal-wax machines; last month we reviewed dye-sublimation printers, which produce photographic results but generally sell for between $8000 and $20,000 (see “Photo-realistic Color Printers,” Macworld, July 1994).
The printers tested for this roundup don’t do as well with scanned images; to simulate subtle color and shading shifts, they create dot patterns—this process is called dithering—that obscure fine details.

We also tested QMS’s ColorScript Laser 1000, the first color laser for less than $10,000. (Other color lasers sell for at least twice that.) The QMS machine produces vivid and durable transparencies and handles a wide range of paper stocks, but it has some drawbacks (see “Color Lasers Move to the Desktop”).

It also did the best job of reproducing the difficult transitions between purples, greens, and blues in the background of the original image. It also did the best job of preserving fine details. Look at the points of the green star in the top-center portion of the image and the white 5 to the lower right of the star. (Note: The banding on this image is an artifact of the process used to print this magazine.)

The Phaser 220i’s corporate sibling, the $9995, solid ink-jet Phaser 300i (top right), performed relatively well but didn’t produce sharp details of the 220. In contrast, the $1298 NuDesign Color Printer (bottom left) darkened the scene so much as to evoke images of Batman’s Gotham City. The NuDesign unit, as well as the $629 Apple Color StyleWriter Pro (bottom center), also suffer from serious banding of colors during transitions, such as in the background.

The $4995 General Parametrics SpectraStar GTx (bottom right) was able to handle color transitions fairly well, but it suffers from an overall washed-out quality. Nor could it capture fine lines, such as those on the document near the upper left corner of the image. The GTx represents the green star as a smudge.

When looking at these images, bear in mind that in most cases, an actual printout will be slightly brighter and more vivid than can be reproduced with the technology used to produce this magazine page.

**NuDesign Color Printer**

**Wide Variations in Color Fidelity and Quality**

When it comes to creating smooth gradations in color and to representing the colors of an original image accurately, you tend to get what you pay for with thermal-wax and ink-jet printers. Compared against the original image (top left), the print from the $5995 Tektronix Phaser 220i (top center)—one of the most highly rated units—came closest to reproducing the difficult transitions between purples, greens, and blues in the background of the original image. It also did the best job of preserving fine details. Look at the points of the green star in the top-center portion of the image and the white 5 to the lower right of the star.

(Original)

(NuDesign Color Printer)

(Bottom left)

Bottom right)

**Into the Liquid Inkwell**

All color printers produce output by applying cyan, magenta, and yellow pigments. But each color-printing technology has its strengths and quirks; printers that excel on plain paper might fall flat with overhead transparency film. To pick the right printer for your jobs, it helps to understand how the technologies work.

Liquid ink-jet printers are spray painters. They use an array of microscopic nozzles that spew liquid ink onto the paper. In liquid-ink printers, the nozzles are part of a disposable cartridge that also contains a supply of ink. The print head travels left and right, making dozens of passes in the course of producing a page.

The ink itself is water based and often wicks into the paper’s fibers as it dries, giving text and line art fuzzy edges. The latest ink formulations from Hewlett-Packard and Canon—the two companies that build every liquid-ink mechanism tested—dry more quickly than did earlier inks and are much less prone to wicking, especially if you print on the special, coated paper that ink-jet manufacturers sell.

Today’s inks are also less likely to smear when the output gets wet. In my scientific output-durability test—wiping a wet finger across the page—the inks used in the Hewlett-Packard DeskWriter printers resisted smearing better than the inks used by the Canon, IBM, and Apple printers—all of which have Canon mechanisms.

**The Battle at the Bottom**

Although the past year has brought progress in every color-printing technology, the real news is at the low end. After striking out with the Apple Color Printer, Apple returned to the drawing board and came up with the $629 Color StyleWriter Pro. What an improvement.

Hardware-wise, the 11-pound Color StyleWriter Pro is an Apple-repackaged version of Canon’s BJC-600, which is winning accolades in the DOS/Windows world. (The BJC-600 can be used with Macs when paired with GDT Softworks’ [604/291-9121] $149 PowerPrint driver and cable package.) Like the defunct Apple Color Printer, the Color StyleWriter Pro produces 360 dpi, but the similarities end there. Apple eschewed the often-finicky SCSI bus in favor of a serial interface. That makes connecting the printer easier but could mean buying a serial switch box if your Mac’s printer and modem ports are already occupied.

The Color StyleWriter Pro’s fast-drying inks all but eliminate the wicking problem. Dramatically improved driver software adds a scatter-dithering option, which delivers better results with scanned images. It also did the best job of reproducing the difficult transitions between purples, greens, and blues in the background of the original image. It also did the best job of preserving fine details. Look at the points of the green star in the top-center portion of the image and the white 5 to the lower right of the star.

(Original)

(NuDesign Color Printer)

(Bottom left)

Bottom right)
images. The new driver also provides better support for Apple's ColorSync color-management software.

The results from the improved driver made a good impression on our output-quality jury—12 Macworld editorial and art-department staff members. In five out of seven comparisons of unlabeled output, the majority of our jury preferred the Color StyleWriter Pro to its closest tested competitor, Hewlett-Packard's $719 DeskWriter 560C. The Color StyleWriter Pro didn't do as good a job with text (the slow side, too). In our tests, done with a prerelease version of the driver, the printer never did reach Apple's claim of two minutes per page. At least the output is worth waiting for.

The Color StyleWriter Pro breaks no speed records, but neither does HP's DeskWriter 560C. The latest in HP's noble line of ink-jets provides 600-by-300-dpi resolution and the Resolution Enhancement Technology previously found only in HP's laser printers. Like all of HP's Mac-compatible ink-jets, the DeskWriter 560C provides higher resolution, and its output appeared a bit more mottled than that of the DeskWriter, with less consistency in the ink coverage.

Like all of the printers tested, the Color StyleWriter Pro can be shared on a network. But unlike the other machines, Apple's ColorShare driver technology makes the host Mac (the one connected to the printer) do all the work required to process jobs. That means the host slows down as it handles jobs from other Macs on the network. The printer itself is on 560C provides a LocalTalk port, making it better suited to network sharing than Apple's Color StyleWriter Pro.

While the Canon-based machines tested provide four ink cartridges (cyan, magenta, yellow, and black), the DeskWriter 560C provides two: a black cartridge and a tricolor cartridge containing cyan, magenta, and yellow inks. This makes replacing ink a bit easier (the Canon cartridges can leak if you aren't careful), but because each of the tricolor cartridge's ink chambers are so small, you're likely to have to replace the $34.95 cartridge more often—even if only one chamber runs dry.

**Moving Up: PostScript Ink-Jet**

QuickDraw printers such as the Color StyleWriter Pro and the DeskWriter 560C give mediocre results when used with PostScript-oriented programs such as Adobe Illustrator and Aldus FreeHand. In the past, the answer has been PostScript-clone interpreters that run on the Mac, such as TeleTypesetting Company's T-Script ($85 to $495, 617/734-9700). DeskWriter 560C and Color StyleWriter Pro users have another choice: true Adobe PostScript Level 2 interpreters that run on the Mac. HP offers a $249 PostScript Level 2 software driver kit for the DeskWriter 560C.

GDT Softworks offers similar software, the $149 StyleScript, for the Apple Color StyleWriter Pro. StyleScript is based on Adobe's Configurable PostScript Interpreter (CPSI), which up to now has been used only on high-end Macs.
printers such as 3M's $20,000 Rainbow dye-sublimation unit. CPSI has stiff memory requirements, though—8MB minimum and up to 12MB for large PostScript images, according to GDT Softworks. Even on a fast Mac, you won’t get sizzling performance, and your Mac will slow as it processes print jobs.

Hardware-based PostScript printers deliver better performance, yet there are only three choices in the liquid ink-jet world. We tested two of them: Lexmark’s $1,199 IBM Color Jetprinter PS4079 and Canon’s CJ-10 with PostScript interface option. (The third machine is HP’s $2,749 DeskJet 1200C/PS.)

Lexmark’s IBM Color Jetprinter PS4079 combines the 360-dpi engine built by Canon for the BJC-820 with a built-in PostScript-clone interpreter. The Color Jetprinter PS4079 is more tortoise than hare—it was the slowest printer tested when used in its best-quality mode, wherein the print head pauses for eight seconds after each pass to allow the ink to dry and prevent one pass from bleeding into the next. In its faster mode, the printer cut 30 percent or more time in four of five tests, but to damn it with faint praise.

To its credit, though, the Color Jetprinter PS4079 provides a built-in LocalTalk port and is compatible with DOS/Windows machines—Apple’s Color StyleWriter Pro and HP’s DeskWriter 560C can’t make that latter claim. The Color Jetprinter PS4079 is also the only liquid-ink-jet tested that provides an emulation mode for the Hewlett-Packard Graphics Language (HPGL), which ensures the printer’s compatibility with drafting and computer-aided design packages. Its ability to handle 11-by-17-inch paper also makes it a good choice for drafting applications.

The Color Jetprinter PS4079 provides enhanced halftoning options, called ColorGrade, that deliver good results with scanned images. Indeed, our output jury generally preferred the Color Jetprinter PS4079’s output to that of the other PostScript-liquid-ink machine: Canon’s CJ-10, which retails for $10,990.

Ten grand for a liquid-ink printer? Yes, but the CJ-10 is actually a desktop copier that marries a Canon color-copier to a 400-dpi ink-jet print mechanism. It’s a good enough copier to prompt a warning in the manual against copying currency and stamps. Front-panel buttons let you adjust brightness, contrast, and color balance as well as reduce and enlarge. The copier also accepts an optional ($1,250) slide-scanning attachment and a video adapter ($1,800) that lets you print images from a camcorder or other video source.

The $10,990 version of the CJ-10 includes Canon's CJ PS-IPU PostScript interface. The PS-IPU sits beneath the printer PS4079's output to that of the next. In its faster mode, the print speed for a 20MB, 200-dpi, RGB Photoshop file using the printer's driver.

Page-Layout Document
Print speed for a 4-page PageMaker newsletter with several fonts, a PostScript graphic, a PICT file, and color TIFF file.

Presentation-Graphic Transparency
Print speed for a PowerPoint presentation with gradient background and color TrueType text.

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**How Fast for Business Color?**

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<th>Printer Name</th>
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<th>Object-Oriented Photoshop RGB Using Plug-in</th>
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**BEHIND OUR TESTS**

Macworld Lab guaged printer speed with a variety of documents and techniques, each designed to test performance from a different perspective. Except where noted differently, we tested the printers at default resolution, using the LocalTalk port.

The PostScript Graphic test shows the performance of a PostScript printer's controller. The Object-Oriented Graphic document also tests controller processing performance. The Photoshop test measures the printer's ability to handle large bitmapped images as well as network interface performance. The Page-Layout test gives the printers a good overall workout and demonstrates how well each machine handles typical publishing jobs. The Presentation-Graphic Transparency test looks at a primary business use for this class of color printer.

To judge output quality, 12 staffers from Macworld's editorial and art departments compared four different unidentified printouts against photographic prints of the original images, looking at highlights, shadows, color accuracy, and text.

—Macworld Lab testing supervised by Mark Hurlow
MS’s $9999 ColorScript Laser 1000 is the first desktop-laser color printer—but your desktop had better be capable of supporting a hefty 106 pounds. The printer uses four toner cartridges; setup and maintenance are more cumbersome than with other color technologies, with numerous hoppers, belts, and drums to replace at varying intervals (see Reviews, Macworld, July 1994).

One big advantage the ColorScript Laser 1000 has over competing technologies is its low operating cost. You can use cheap photocopier bond instead of the ultra-smooth laser bond or special, coated stocks that thermal-wax machines require. Also, the amount of toner applied varies depending on what’s on each page; by comparison, a thermal-wax printer always uses an entire set of four ink sheets for each page, wasting pigment for pages containing mostly white space. These factors combine to deliver output that costs only 5 to 10 cents per color page, versus about 60 cents for thermal-wax.

Where output quality is concerned, there’s good and bad news. The good news is that business documents look great—colored bar charts and spot-color headlines stand out beautifully against sharp black text. (Our output jury gave high marks to the machine’s text quality.) The output is also more durable than thermal-wax or solid-ink output, with no flaking or scratching.

But the printer’s colors aren’t as vivid as those produced by competing technologies, nor do scanned images look as good. (The printer ranked near the bottom in most image-quality tests.)

The printer’s speed in most tests was good, although it finished second-to-last among all printers tested in our Photoshop test.

But the ColorScript Laser 1000 isn’t designed for prepress or digital-imaging applications. It’s intended to provide color capabilities to a workgroup that would otherwise use a monochrome laser printer, and it meets this goal. The ColorScript Laser 1000 is suitable for business color applications and for printing short runs of color documents such as presentations. You decide whether these strengths outweigh relatively slow performance, and high maintenance requirements and price.

At press time, QMS announced another color laser printer: the QMS magicolor Laser Printer, which is the world’s first 600-dpi color laser printer. The magicolor uses an engine similar to that of the ColorScript Laser 1000 (indeed, an upgrade is available for $2499, including installation). Unlike many thermal-wax machines, the magicolor provides 600-dpi resolution in both the horizontal and vertical dimensions. The sample output I examined boasted smooth-edged text and halftones whose quality matched that of the best solid-ink and thermal-wax machines.

By the time you read this, the magicolor Laser Printer should be available in two configurations: a $9999 model that prints in monochrome at 600-dpi and in color at 300-dpi; and a $10,999 model that supports 600-dpi color. (The only other difference between the two is memory: the low-end version provides 12MB, while the all-color model contains 28MB.)

Xerox (800/275-9376, ext. 4900) will also offer a desktop color laser unit, the 4900 Color Laser Printer, which should be announced by the time you read this. The printer will sell for under $10,000 and boasts a resolution of 1200 by 300 dpi. The unit is aimed at the same market as the QMS units—business color for presentations, marketing materials, and internal reports.
Finding the Best Business Color

The printers have warm-up times that rival that of a starting pitcher, taking about 20 minutes before their ink sticks are melted.

A more serious drawback is that solid-ink machines produce transparencies that look washed out when projected. That’s because the solid beads of ink tend to refract light from the projector. Both Dataproducts and Tektronix sell desktop printers that apply a second layer of wax printers also provide unique output options, including media for making iron-on fabric transfers and static-cling signs. (Seiko’s machines support the largest selection of offbeat output options.)

Best of all, thermal-wax prices have fallen substantially; Seiko Instruments’ Personal ColorPoint PSE, an Editors’ Choice in last year’s roundup, retails for just $2999, while Tektronix’s Phaser 200e lists for $2995 (down from $3595 last year). Fargo’s Primera sets a new low at just $995, while Tektronix’s Phaser 220e and 220i, DEC’s DECColorwriter 1000, and General Parametrics’ SpectraStar GTX and SpectraStar GLX provide 600-by-300-dpi output, obtaining the higher resolution on the long axis of the page by advancing the paper in smaller steps. The benefits are the same as with any type of noncontinu-

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**Company** | **Phone** | **Product** | **Imaging Technology** | **Tested by Macworld Lab** | **List Price** | **Standard Ports/Optional Ports/All Active**
--- | --- | --- | --- | --- | --- | ---
Apple Computer | 408/996-1010, 800/767-2775 | Color StyleWriter Pro | liquid ink-jet | | $629 | S/none/NA
Brother | 908/356-8800, ext. 4200 | Brother HSB-1820 | solid ink-jet | | $1959 | P, S/none/ON
CalComp Systems | 800/225-2667 | ColorMaster Plus 6980XF | thermal wax | | $5495 | L, P, S/none
Canon USA | 800/848-4123 | UIC-820 | liquid ink-jet | | $2199 | P, S/none/ON
Dataproducts Corporation | 800/980-0374 | Jet Pro | solid ink-jet | | $5995 | P, S/none
Digital Equipment Corporation | 508/493-5111 | DECColorwriter 1000 | thermal wax | | $3999 | L, P, S/none
Fargo | 612/941-9470, 800/327-4622 | Primera Color Printer | thermal wax | | $4995 | P, S/none/O
General Parameters | 510/524-3950 | SpectraStar GTX | thermal wax | | $3795 | P, S/none
Hevitex-Packard | 800/752-0900 | DeskWriter C | liquid ink-jet | | $485 | L, S/none/O
Seko Instruments | 408/952-5800, 800/873-4561 | Personal ColorPoint PSE | thermal wax | | $2999 | L, P, S/none/O
Tektronix | 800/547-8949 | Phaser 220e | thermal wax | | $2995 | L, P, S/none/O

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*E = Ethernet, L = LocalTalk, N = not applicable, P = parallel, S = serial, SCSI = small computer system interface. T = Token Ring, TC = TCP/IP. *PostScript Level 2 optional. *$600 by 300, black. *Also provides dye-sublimation imaging.

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Iron-on Color

Thermal-wax printers’ color comes from a roll of plastic film coated with pigmented wax in each of the three process colors (and optionally, black). The plastic is sandwiched between the paper and a print head containing thousands of evenly spaced heating elements. Where an element is hot, it melts a dot of wax, which transfers to the page. After one color’s dots are applied, the ink roll advances to the next color.

In the last few years, as dye-sub printers have become cheaper, ink-jet printers have become better, and color lasers have knocked on the door, some people have predicted the demise of thermal-wax technology. But death reports would be premature. Thermal-wax manufacturers have added plain-paper capabilities, and thermal-wax machines were the fastest color printers Macworld Lab tested. Thermal-wax printers also provide unique output options, including media for making iron-on fabric transfers and static-cling signs. (Seiko’s machines support the largest selection of offbeat output options.)

Best of all, thermal-wax prices have fallen substantially; Seiko Instruments’ Personal ColorPoint PSE, an Editors’ Choice in last year’s roundup, retails for just $2999, while Tektronix’s Phaser 200e lists for $2995 (down from $3595 last year). Fargo’s Primera sets a new low at $995, but it’s slower than these machines and its 203-dpi output isn’t in the same league. The Primera is also sold by NuDesign Engineering as the NuDesign Color Printer for $1298.

Fargo and Seiko have taken a different approach to fending off competing technologies. Both firms offer thermal-wax machines that also operate as dye-sublimation printers (see “Photo-realistic Color Printers,” Macworld, July 1994).
### BUSINESS COLOR PRINTERS

In a complex, broad category of color printers for typical business tasks, we selected winners in three categories.

#### Low-End Ink-Jet

**DeskWriter 560C**
- This printer offers excellent text quality, thanks to its 600-by-300-dpi resolution and HP's Resolution Enhancement Technology.
- **Company:** Hewlett-Packard
- **List price:** $719.

#### Solid Ink-Jet

**Phaser 300i**
- Tektronix made a good thing better when it improved the output quality and performance of its venerable Phaser 300, which remains available at a reduced price.
- **Company:** Tektronix
- **List price:** $599.95.

#### Thermal-Wax Transfer and Color Laser

**Phaser 220i**
- This printer combines plain-paper capabilities, 600-by-300-dpi resolution, and fast performance.
- **Company:** Tektronix
- **List price:** $599.95.

### Picking the Winners

Among low-end ink-jets, the Apple Color StyleWriter Pro delivers superior image quality (though inferior text quality) and is more compact. The HP DeskWriter 560C's superior text quality and networking features give it an edge over the Apple unit but by a small margin. If you can live with the Color StyleWriter Pro's approach to networking, and image quality is most important to you, pick the Apple unit.

In the solid-ink world, Tektronix's Phaser 300i wins hands down. The DataProducts Jolt PSc costs far less, but it can't print tabloid-size pages and its output is on the fragile side. If you need color business documents, consider a plain-paper-capable thermal-wax machine instead.

Tektronix gets the gold in the thermal-wax category, too. Its Phaser 220i is fast, and its 600-by-300-dpi resolution yields the best thermal-wax output quality I've seen. If your budget barks at the $599.95 price, consider the $399.95 Phaser 220c, which delivers similar quality.

John,

How are you doing now? I'm afraid anything important might have gone by since we last talked. Think about the several things.

From: John Nag
To: Bruce Cal
Subject: Changes

John:

How are you doing now? I'm afraid anything important might have gone by since we last talked. Think about the several things.

To: Bruce Cal
Subject: Changes

John:

How are you doing now? I'm afraid anything important might have gone by since we last talked. Think about the several things.
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It's because CompuServe makes John's life so much more exciting. He shops for clothing, reads software demos, and checks the weather where his sister lives. He even learns new and better ways to use his Mac in CompuServe's Mac Journal. All this excitement makes John happy and keeps John's Mac busy. Which is why you should contact CompuServe too. Call: 1-800-848-6199, ext. 214 for international inquiries. Because as we all know, a busy Mac is a happy Mac. See us at MacWorld Exposition/Boston, World Trade Center, Exposition Hall, Booth 5228. Circle 66 on reader service card.
Two Ways to Make a Big Impression

NEED POSTER-SIZE, FULL-COLOR OUTPUT? If so, you've got two new options: a Hewlett-Packard ink-jet printer designed for producing in-house, large-format images, and a Raster Graphics electrostatic printer for short-run color jobs from your service bureau.

The HP DesignJet 650/PS, expected to be available in June, is a PostScript Level 2 ink-jet device capable of printing five-color (CMYK, plus a spot color) images up to 3 feet wide and 9 feet long. The DesignJet is aimed at graphic designers who need to quickly produce inexpensive, large-format comps and posters.

The HP DesignJet comes in two models: D-size (24 inches wide), for $9995; and E-size (36 inches wide), for $11,595. The printer uses special ink-jet cartridges and paper; a 3-by-4-foot print would cost an average of $3 to $5 in consumables, compared with the $50 or more you'd pay a service bureau to output your file.

The 300-dpi printer uses an Intel 8060CA RISC chip and offers three printing modes: Draft, Final, and Enhanced. In Enhanced mode, HP's new scatter-half-toning rendering helps eliminate banding. The printer comes standard with LocalTalk, EtherTalk, Novell Ethernet, TCP/IP, Centronics parallel and RS-232C serial connectivity, 4MB of memory (upgradable to 68MB using proprietary HP memory), 39 Adobe Type 1 PostScript fonts, and Pantone color reference tables. The DesignJet isn't exactly a desktop printer, though— the 24-inch output model, for instance, weighs 128 pounds and is 43 by 28 by 45 inches.

Meanwhile, Raster Graphics' Digital ColorStation 5400 is able to produce four-color prints up to 52 inches in width and of virtually unlimited length. The ColorStation 5400 is designed for short-run, on-demand color print jobs (on coated stock) of 1 to 200 copies.

Pedal-to-the-Metal Slide Scanner

POLAROID CORPORATION'S ELECTRONIC Imaging Systems group has introduced the SprintScan 35, a $2495 color 35mm slide and film scanner that reportedly digitizes images at top resolution (2700 dpi) up to ten times faster than competitive slide scanners.

The SprintScan 35 uses Polaroid's proprietary implementation of Time Delayed Integration, a method by which the scanner's trilinear CCD array passes more quickly over an image yet yields better scanning results. In addition, the device includes such hardware-based features as sharpening, color correction, and image scaling for fast image processing. The SprintScan captures images in a single pass in 30-bit color and automatically samples them to 24-bit.

The SCSI-2-device SprintScan will ship in late July with an Adobe Photoshop plug-in filter for scanning directly into the image-editing application; a Windows version will ship in June. Polaroid, 800/662-8337.—J.A.M.
ReadySetGo Prepares for GX

MANHATTAN GRAPHICS Corporation is going against the grain and developing a version of ReadySetGo for the PowerPC and 680X0 architectures that's largely dependent on QuickDraw GX.

The company says that the GX edition of the page-layout program will give users a single imaging and printing architecture—QuickDraw GX—as opposed to relying on QuickDraw for screen rendering and PostScript for output.

To date, however, ReadySetGo's support for GX is unusual among page-layout programs. There are currently no plans to add GX capabilities to Quark-XPress, according to a Quark spokesman. Aldus declined to talk about specific plans for GX support in PageMaker.

ReadySetGo GX version 6.5 (the program's likely name) will offer GX features such as automatic ligatures, optical font alignment, text on a curve, and page-by-page formatting. The program will also let users draw and edit quadratic Bézier curves; one version of the program will support Arabic and Hebrew text, and another version that supports kana will be available in early 1995. Because it relies on GX for many capabilities, the program will require minimal RAM and hard drive space and will run faster than previous ReadySetGo versions, the company says.

ReadySetGo 6.0, the current version, will continue to be available for users without QuickDraw GX. The GX version will ship later this year. Suggested retail price is $395; upgrades from ReadySetGo versions 5.0 and 6.0 should be about $70. Manhattan Graphics, 914/725-2048, 800/572-6533. -I.A.M.

Adobe Revamps Licensing, Updates ATM

ADOBE SYSTEMS HAS BEGUN licensing its fonts for use on up to five computers for each individual typeface package purchased. In the past, Adobe's font licenses were for a single printer. But the company says that a growing number of users prefer per-computer licensing agreements, which make it easier to ensure that the users have the appropriate number of licensed copies of a particular typeface.

The new licensing policy doesn't allow you to give a copy of a font to your service bureau. Adobe has unveiled a new pricing policy specifically for service bureaus, however. The policy enables any service company whose primary business is graphical output to pay as little as $10 per typeface (a savings of $15 or more) using Adobe's Type On Call CD-ROM font-unlocking system.

Adobe also announced that the native-mode PowerPC version of Adobe Type Manager is scheduled to ship in July. ATM version 3.8 will automatically install either the PowerPC or 680X0 version of discarding, depending on your Mac's CPU. ATM 3.8 will also include font substitution, as previously available in SuperATM. Separately, Adobe announced that ATM is now included, without charge, in every font package it sells. Adobe Systems, 415/961-4400, 800/833-6687. -I.A.M.
Imagine a high-performance 650hp mower with 10 sets of blades. Welcome to the world of MicroNet. We’re reshaping the desktop landscape with storage products and a technical support network designed to increase your productivity. Our 17.3 GB Raven array has displaced the solitary drive. A 200 MB SyQuest has eclipsed the 88. The 1.3 GB optical rivals the speed of a hard disk. And our 32 GB DAT backs up those irreplaceable moments.
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by Cathy Abes

**Artist:** Daniel Pelavin is an illustrator and typographic designer based in New York City who began working regularly on the Mac two years ago. Pelavin’s typeface ITC Anna was recently added to the Adobe Type Library.

**How It Was Done:** Pelavin began designing the typeface he calls Monograph by sketching the letters on paper. In Illustrator, Pelavin created the skeleton of each character out of simple strokes. Monograph has a fairly uniform stroke weight; its uppercase and lowercase letters differ in weight only slightly to maintain a consistent appearance.

To create Monograph’s bold characters, Pelavin doubled the size of the original letters and scaled up their line weight, then reduced them back down to normal size without scaling down the weight. Then he manually fine-tuned some of the letters, such as shortening the loop in the uppercase C and shortening the serifs on the uppercase F and T.

Although many fonts include stock character sets for unusual characters such as ligatures and symbols, Pelavin elected not to follow this route. Instead he designed each of Monograph’s special characters from scratch.

After designing the complete 223-character set—including foreign-accented letters, symbols, and punctuation—Pelavin’s next step was to convert the strokes to outlines so the characters would be ready for importing into the font-creation program Fontographer. While it includes many of the tools found in Illustrator, Fontographer also contains features specifically for controlling a typeface’s width and spacing, or kerning.

Finally, after Pelavin had finished testing and adjusting the letters for proper spacing and optimum readability, he was ready to generate the final Type 1 PostScript font in Fontographer’s Generate Font Files window. This produced an outline font that would output at the best available resolution on any PostScript device, and a bitmap font for 72-dpi screen display.

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THE TOOLS

**Hardware:** Mac Iici with 20MB of RAM and 240MB internal hard drive; APS 128MB magneto-optical drive; Sony 20-inch Trinitron color display; Radius PrecisionColor 24x 24-bit accelerated graphics card; Logitech ScanMan hand scanner; Hewlett-Packard DeskJet 1200C/PS color ink-jet printer; Mouse Systems Little Mouse ADB optical mouse.

**Software:** Adobe Illustrator 5.0.1; Altsys Fontographer 4.0.3.
4 Using the paths that make up the letters' skeletons, Pelavin applied the stroke weight and viewed the resulting letter weights in Preview mode.

5 To convert the strokes to outlines, Pelavin used the Outline Stroked Path filter (under the Filter menu in the Objects submenu) and the Unite filter to make a single shape out of characters—such as the M and the N—that were composed of multiple paths.

6 To create Monograph's bold characters, Pelavin scaled all the letters 200 percent with the Scale line weight option checked in the Scale dialog box to uniformly double the weight of all the lines. Then, without deselecting; he unchecked the option and scaled the lines back down 50 percent, which brought the letters back to their original size but kept the line weights doubled.

7 He brought the letters one by one into Fontographer by selecting the character, option-copying it to create a PostScript version that Fontographer could read, and pasting it into its own separate Character window.

8 Fontographer's font window, which lets you view all characters simultaneously, can be configured to display such information as character widths, left and right sidebearings (the amount of space allotted for the width of each character, including the space to the left and right of it), and keystroke (the key the letter is mapped to).

9 In the Metrics window, Pelavin set the kerning specifications to control the spacing between certain pairs of letters—such as the capital T and the lowercase o—for better readability and aesthetics.

10 With everything closed except the Font window, Pelavin chose Fontographer's Generate Font Files command (File menu), setting parameters such as output formats and ID, which facilitates font caching in PostScript printers (so the font will remain in the printer's memory and not be flushed after printing).
ONLINE STOCK-PHOTOGRAPHY SERVICES PROMISE TO MAKE the process of searching for and obtaining images faster, easier, and less expensive. The idea is to connect via modem to a central database with thousands of images from a variety of sources. Once you are online, you can use keywords or phrases to look for the types of images you want, then download candidates as low-resolution thumbnails. When you decide on an image, you can go back online and download a high-resolution version for use in your layout.

Again, that’s the idea behind online image access. To find out how much of it is real, I put the current crop of electronic-image services—Comstock On-Line Access, PressLink, and Kodak Picture Exchange—to the test to see if they really do save money, time, and headaches. Among the things I looked for: How easy is the software to learn and use? How comprehensive are the search capabilities? How usable are the images that you download? And how much money will you really spend using these systems?

**Comstock On-Line Access**
Since it has no electronic search capability, Comstock’s On-Line Access—which gives you access to 15,000 of Comstock’s most popular images—provides a rather piecemeal approach to digital delivery.

You must search for images by flipping through the hefty, printed Comstock catalog included in On-Line Access’s sign-up package. When you find the images you want, you dial Comstock’s toll-free number using a modem, type in the catalog numbers for the images you want, then download the low-resolution proofs from Comstock’s electronic bulletin board. The proofs (about $0.50 each) are compressed with Kodak’s ColorSqueeze utility to about $0.25 each, so each proof takes only a few minutes to download. Once the image is on your hard drive and you’ve signed off, you can use ColorSqueeze to decompress the digital photo to its original size—about 5 inches by 7 inches at 72 dots per inch.

On-Line Access is quick, trouble-free, and inexpensive. A typical, ten-minute online session in which you download three images costs between $25 and $40, depending on the photos you choose. Comstock also offers a scanning service: if you want an image that has not yet been posted on the bulletin board, Comstock will scan and upload a low-resolution version of the photo for you. To receive this service, however, you can expect to tack on Comstock’s standard research fee of $60.

Despite its name, On-Line Access is not a full-featured online service. You cannot search online, you must negotiate usage fees for an image over the phone, and you still need to obtain transparencies. But if it is 10 p.m. and your preliminary layout is due tomorrow morning, On-Line Access could be your ace in the hole.

**Charges:** Sign-up fee $99; $2.85 per log-on; 85 cents per minute of usage; research fee for posting new images $60; design proofs $4.50 to $9 each. **Phone:** 212/333-8600, 800/225-2727.

**PressLink**
Many small-to-midsize newspapers and magazines can’t afford satellite hookups to get a steady stream of timely images. Instead, they’re turning to a cost-effective alternative: PressLink, a Knight-Ridder subsidiary.

At press time, PressLink offered more than 150,000 images from some 14 media giants, including Times-Mirror, Reuters, Associated Press, United Press International, and Gannett. With PressLink, you can find photos of political and entertainment figures, snapshots of last night’s all-star baseball game, and even Aldus FreeHand infographics from current issues of Time and USA Today. The trick, as always, is finding the images you want—and PressLink doesn’t make it particularly easy.

Once you’ve dialed the local-access phone number and entered your password, PressLink presents you with a screen full of folders, each one representing a particular news service. Because the services try to protect how their images are used, there are no links between them. If you’re looking for a photo of last week’s hurricane in Alabama, for instance, you have to spend several minutes opening a dozen folders and searching within each one to find the right image.

In addition, the image providers offer only a handful of keywords to identify images. This wouldn’t be too irksome, except that you can’t whittle down your choices by viewing thumbnails
online—you can only read an image’s caption. To view thumbnails, you must download them to a folder on your hard drive; each image is compressed to between 8K and 10K using proprietary software and takes 10 to 15 seconds to download. Once they’re on your hard drive, you view the thumbnails by double-clicking on a thumbnail file’s icon to automatically launch the PressLink Access utility. When you find an image you like, you then log back on to PressLink to retrieve the JPEG-compressed high-resolution version of the image and download it to your hard drive. Each image is 140K to 250K in size and takes between 5 and 10 minutes to download.

The good news is that your final, decompressed color image is a healthy 2MB to 4MB in size. Even better, most of the content providers charge little for the images and allow multiple uses over a fixed period of time. UPI, for instance, offers newspapers unlimited use of photos for 90 days for a mere $25 per image. Add that to PressLink’s reasonable hourly online rate and download charge, and you’ll find that using high-quality photos in your publication doesn’t have to cost a bundle.

Charges: Sign-up fee (software included) $50; monthly service fee $9.95; $15.95 per hour of usage; all downloaded information costs $0.0575 per thousand characters; content providers charge usage fees of $25 and up for high-resolution images. Phone: 703/758-1740.

Kodak Picture Exchange

At press time, 17 stock-photo houses—among them FPG, PhotoBank, and ProFiles West—had contributed nearly 100,000 images to Kodak Picture Exchange (KPx). But unlike those on PressLink, every KPx image (the majority are in Kodak’s Photo CD format) carries a detailed description that follows Kodak’s specifications. This makes it possible to search all of the content providers’ images simultaneously.

Of the three services I tested, KPx comes closest to delivering on the promise of online image access. The software is easy to learn; I was able to perform simple searches and download images without cracking open the manual. The service is fast (KPx supports 9.6-Kbps, 14.4-Kbps, and ISDN transmissions) and powerful—even complex searches showed the number of hits within a few seconds, and I could quickly narrow my search criteria for a manageable range of images.

Here’s a typical session. After launching the program—which automatically dials KPx’s toll-free number—and choosing from a list of image providers (you can select them all if you want), you’re ready to start searching. For a simple search, you can type a few keywords, such as children and dogs; within a few seconds you’ll see the number of images found that fit your request. (The above search yielded 133 hits.)

You can then choose how many thumbnail images you want to see and at what sizes—small (32 by 48 pixels), medium (64 by 96 pixels), or large (128 by 192 pixels, the same as the smallest Photo CD resolution). The program automatically downloads all thumbnails to your hard drive. For maximum speed (but minimal visual appeal), you can also download only the text description of an image.

KPx makes it relatively easy to perform more complicated searches, too. In the children-and-dogs example, I narrowed my search to include only images of a boy and a dog, in vertical format, with space at the top for a headline; using those criteria, my search yielded nine images. I could then pick from those images and download a 256-by-384-pixel design proof.

Once you’ve made your decision, you can order an image.
Taking Stock of CDs

Thanks to the growing ranks of CD-ROM-drive owners, a new means of distributing images is gaining popularity—high-resolution stock-photo CDs. Unlike the catalog CDs published by such stock agencies as FPG International—which typically contain thousands of low-resolution (usually 72-dpi) images for on-screen browsing and use in comps—CD photo collections often contain between 60 and 400 electronic images at 300-dpi resolution that are suitable for printing at sizes ranging from 5 inches by 7 inches to 15 inches by 10 inches at a 150-line screen. (All the CDs reviewed here also offer low-resolution versions of the images for browsing and multimedia use.)

Unlike using a stock-photo agency, where you pay for every use of the image you choose, purchasing a stock-photo CD generally enables you to use any image on the disc as many times as you like, without additional charges.

I evaluated more than 50 high-resolution stock-photo CDs, keeping an eye toward image quality as well as aesthetics. From that pile, the following three multiple-disc, wide-ranging image collections and three single-disc general-purpose collections were standouts.

Multiple-Disc Collections

Corel Professional Photos Easily the largest collection of high-resolution images on CD, the Corel Professional Photos series offers more than 100 specific categories—one category per disc—to choose from. Most of the CDs deal with travel, animals, or plants, although the collection is expanding to include subjects such as law, business, and residential interiors. Most images have noticeable imperfections, and more of these photographs need color adjustment than on the other discs I reviewed. But with 100 Photo CD-formatted images on each $49.95 disc, I can't complain. Corel, 613/728-3733, 800/772-6735.

Digital Stock's Professional Series Excellent color balance, superior compositions, and only an occasional scanning imperfection characterize this collection of 20 CDs (100 images per disc). Digital Stock CDs cover the breadth of images: among the disc categories are Active Lifestyles and Buildings and Structures. Included in the collection is a Signature Series: each disc highlights the works of a particular photographer. All Digital Stock images are in Photo CD format. Each disc is $250 (10 percent discount for 5 to 9 discs; 15 percent for 10 or more; Signature Series discs are $350 each). Digital Stock, 617/794-4040, 800/545-4514.

PhotoDisc Like Digital Stock's, PhotoDisc's images cover the gamut of subject matter and are well chosen and nicely framed. You get a greater quantity of images on a PhotoDisc CD—most have 336 photos—than you do with Photo CD-formatted discs, but the PhotoDisc images are slightly smaller. There are currently 13 discs in the series; volumes 1 and 2 have too many scanning imperfections and dark midtones, but a PhotoDisc company representative said that rescanning those images is a top priority and that there will be a nominal upgrade charge for anyone who already owns the volumes. PhotoDisc images are compressed via JPEG; each disc contains between 111 and 409 images and costs $299 (except for volume 3, which goes for $199). PhotoDisc, 266/441-9385, 800/528-3472.

Single-Disc Collections

ColorBytes Samplers One and Two Although a bit heavy with nature shots, these two general-purpose discs have the best-scanned images of any I reviewed. They offer excellent color balance and large images sizes—several megabytes larger than even the maximum size supported by the Photo CD format. One annoying restriction: you must include a credit line for the photographer if you use any part of a photo. Images are compressed in JPEG format; each disc contains 100 images and costs $399 (discounted indefinitely to $249). ColorBytes, 303/969-9205, 800/825-2656.

Electric Iris Signature Series, Vol. 1 No. 1 This is perhaps the most wide-ranging single-disc collection of stock photos around. The $129 disc offers 60 RGB TIFF images from photographer Chris Grajczyk; they include both the expected (sunsets and children) and the unexpected (a body in a morgue). The images are nicely composed but grainy, with colors a bit oversaturated. Digital Knowledge, 612/595-0801, 800/279-4099.

Left to right: ColorBytes; Corel Professional Photos; Digital Stock; PhotoDisc company representative said that rescanning those images is a top priority and that there will be a nominal upgrade charge for anyone who already owns the volumes. PhotoDisc images are compressed via JPEG; each disc contains between 111 and 409 images and costs $299 (except for volume 3, which goes for $199). PhotoDisc, 266/441-9385, 800/528-3472.
online. But here’s where KPX disappoints by regressing to the
timeworn tradition of phone negotiation. After you specify how
you’ll use the image (for example, book cover, 10,000 print run,
and USA only), KPX electronically routes your order to the
appropriate image provider, and a representative of the provider
calls you with a price. It seems logical that prices for some images
might need to be negotiated; but if I’m browsing online, I like
to have an idea right then and there what a particular image will
cost. After all, price can be a big part of my decision.

Another caveat, particularly for those on a tight deadline, is
that KPX currently can’t download high-resolution files via
modem. So if you need the image today, you’re out of luck. You
can receive an image on a Photo CD or transparency via next-
day air delivery, however, and the company says that a future
version of KPX will let you download high-resolution files.

KPX seems pricey—the sign-up fee alone is $399—but if
you frequently request stock photos from a number of agencies,
you could realize substantial savings in the long run. If you were
to make search requests from four stock houses, for instance,
chances are that each agency would charge you a $60 research
fee—a total of $240. Add to that, $20 in round-trip, rush airfare
charges for each stock-house mailing, and that’s another $120—
for a grand total of $360. Deduct $60 as a rebate from the agency
fees $9 to $50.

Using KPX, a novice can easily search and download 50
thumbnails from a variety of image providers in 30 minutes;
experienced users will need only half that time. That translates to
research costs of between $21.25
and $42.50, based on KPX’s $85-
per-hour online usage fee. Throw
in $30 for a typical design proof and another $30 for round-trip
transparency or Photo CD deliver-
ry and return, and you’re still at
around $100 per image (not
including your sign-up fee).

**Charges:** Sign-up fee (in-
cludes software and two hours
of free usage) $399; $85 per hour of
usage; design-proof download
fees $9 to $30. Phone: 716/473-
7300, 800/579-8737.

**More to Come**

By the time you read this, Picture
Network International, or PNI
(703/558-7860), is expected to go
online with Seymour, a direct
competitor to KPX aimed at
designers, ad agencies, book publish-
ers, newspapers, magazines, and
multimedia producers. At press time, 14 providers have sup-
plied the system with images, and
as many as 15 more are expected by
year’s end.

Seymour will sport a snazzy
interface and let you search by
natural-language phrases (such as
three executives talking in front of a
building) instead of keywords.
Thumbnails and design proofs
will come in TIFF format, proofs
will be as large as 700K (591 by 394 pixels), and the system will
support modem speeds between 9.6 Kbps and 28.8 Kbps.

With Seymour you’ll be able to get the exact price of any
image (based on your usage), order it, and obtain a high-resolution
version by downloading a Photo CD file. (The maximum
Photo CD image size is 2048 by 3072 pixels.) If you prefer, PNI
will also send the image on a Photo CD or SyQuest cartridge,
or as a transparency.

Meanwhile, Microsoft chairman Bill Gates’s search for
images to use on the HDTV screens in his new home has
unfolded into a new company, Continuum Productions Corporation
(206/641-4505, 800/677-4172). Continuum’s mission is
to develop a digital archive of multimedia content. At this point
in its evolution, the company is focusing on licensing and obtaining
still images from photographers, museums, libraries, the
public domain, and private archives and institutions. Images are
being scanned at HDTV resolution (2000 by 3000 pixels), cata-
loged, and assigned keywords. The company also plans to
develop a visual online navigation system. Although Continu-
im is currently providing images to producers of multimedia
titles, by the time you read this the company will be making
images available online to other users as well.

**Picturing the Future**

We’re moving toward a scenario in which art directors never
touch an actual transparency from a stock house. In fact, if you
use KPX, it’s quite possible to accomplish that feat today. By the
end of the decade, online image databases will have millions of
images cataloged, and using them will likely become de rigueur.

So why aren’t the visionary systems reviewed in this article
going great guns today? (The largest of them, PressLink, boast-
ed a mere 3000 subscribers at press time.) One reason is that
they’re relatively new, but a bigger obstacle is technophobia: say
the word modem to many designers, and their eyes glaze over—
that is, until they actually use one for an online joyride. Then
they’re hooked.

If you frequently use traditional stock-photo agencies, give
their online counterparts a whirl. If you like Comstock’s images and
use them frequently, you should consider signing up with On-Line
Access. If you prefer to shop at a number of stock houses, by all
means try out KPX. And if you
need low-cost images of current
events, PressLink should fill the
bill. These services—and others
coming down the pike—are making
it easier and cheaper than ever
to load your Mac with the images
you need.

Designer/writer JIM BENSON is coauthor,
with Cher Threinen Pendavis, of the

**Two Stock Services** It pays to be specific when you search on Kodak Picture
Exchange (top). A request for images with the keyword *Mardi Gras* was rewarded
with 22 hits (some of which are shown here), but only half of the images
were actually of Carnival; the others were generic New Orleans scenes. Typing
*Mardi Gras* and costume whittled the number of hits to 6. Seymour (bottom).
from Picture Network International, will have the sharpest-looking, easiest-to-
navigate interface of any online stock-image service. You can easily view a
wealth of information—such as image orientation and photographic attributes—
about a particular image. Seymour should be online by the time you read this.

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FILEMAKER GOES CLIENT/SERVER

Claris is developing a new version of FileMaker designed to make sharing FileMaker databases across a network viable.

FileMaker Pro Server will run on AppleTalk networks and be able to drive databases created in FileMaker Pro 2.0 or 2.1. The server version will open up to 16 databases at once, and juggle tasks such as searching or sorting by interrupting one task to start another and threading multiple tasks. It will run on 680X0 systems, or in native mode on Power Macs. FileMaker Pro Server will list for $1499 and should ship in July.

Claris is also developing a run-time engine that can be incorporated in FileMaker databases. For commercial-application developers, there is no license fee for distributing the run-time engine; the cost for in-house developers will vary based on quantity. The run-time will be sold as part of FileMaker Solutions Development Kit, a CD-ROM that will include FileMaker tips and pre-designed buttons. It should ship in July for $499 and will be available only to members of Claris's FileMaker developers organization, Claris Solutions Alliance. Claris, 408/727-8227.—D.L.

THE INDEPENDENT INVOICE

MySoftware is shipping MyAdvancedInvoices, the Mac's first stand-alone invoicing package.

MyAdvancedInvoices can generate a bid and convert it to an invoice when the bid is accepted. The program includes a number of preset reports; it can create summary and detail reports of accounts receivable, customers, and invoices (plus sales-tax, receipts, and trend reports). You can select a date range for reports; change field names; sort data based on any field; add a logo to your invoices; and print a message on each invoice. The program allows you to enter a single discount rate for all customers. It lacks calculations in its searching and reporting; for example, it is not possible to retrieve all overdue invoices over $1000.

MyAdvancedInvoices is also designed to transfer data to MySoftware's other Macintosh products—MyDatabase, MyAdvancedDatabase, MyMailList, and MyAdvancedMailList—making it possible to generate collection letters, direct-mail pieces, and so on. Version 1.0 does not communicate with software from other vendors, but MySoftware plans to add that capability to an upgrade.

The list price for MyAdvancedInvoices is $59.95. MySoftware, 415/325-9383, 800/325-3508.—D.L.

TIMESLIPS RETOOLED

Timeslips Corporation is developing version 2.2 of Timeslips III, time-billing software for professionals who charge by the hour. The new version will be able to manage complex billing rates and will sport a redesigned and more accessible interface.

Timeslips 2.2 will support a matrix of billing rates to charge different hourly
Mac Automates Credit Card Sales

Has Your Business Been Burned Because Verifying Credit Card Sales Manually Seems Like Too Much Trouble? Do You Need to Automate the Whole Point-of-Sale Process? MacAuthorize, which is being upgraded to version 2.0, verifies credit card transactions over bank-card networks and then deposits the sale in your account—without leaving your sales or customer database.

Salespeople feed credit card information into MacAuthorize with a credit card reader (MacAuthorize works with readers from TPS Electronics and Time-Keeping Systems) or by keying the information into the Mac using a data entry screen that resembles a credit card slip—the kind stores run through those clunky imprinters. MacAuthorize then dials the bank-card network for approval. Depending on the network used, funds are deposited after each sale or at the close of the business day. Version 2.0 automatically deducts the bank discount on each sale (the fee charged for using the network, generally between 1 and 5 percent). Using Apple events, you can access MacAuthorize from within databases such as 4D and FileMaker Pro.

Version 2.0 should ship before you read this. Its price was not set at press time, but it will be more than the $315 cost of the current version. Free demo versions of MacAuthorize are available from online services including America Online and CompuServe, or from Tellan Software at 408/274-1110 or 800/483-5526.—SUZANNE COURTEAU

OCR That Thinks?

Ligature Software wants to add some brains to optical character recognition with CharacterEyes, an omnifont OCR program that uses neural network technology to improve speed and recognition accuracy.

Like all omnifont OCR programs, CharacterEyes identifies a character's major features, such as crosses and loops, and tries to match them to the features of common fonts. To find matches, CharacterEyes uses neural network technology, which works much like the brain, with its many connected neurons, to interpret ambiguous data such as the dot pattern of faxed text. Ligature says the neural network improves the program's success with difficult-to-read fonts and poor-quality documents. You can train CharacterEyes to recognize fonts that its omnifont engine can't decipher.

Ligature claims CharacterEyes achieves a real-world recognition rate of 200 characters per second with 99.6 percent accuracy. Additionally, CharacterEyes retains document attributes such as columns and tables, and the program can batch-process stored TIFF files, check the spelling of text, and export recognized text in Microsoft Word and WordPerfect format. It incorporates Hewlett-Packard's AccuPage technology and supports most major flatbed scanners. CharacterEyes lists for $695. Ligature Software, 617/272-3085.—JIM FEELEY
"A valuable tool that should be on the shelf of anyone who manipulates images on the Macintosh."

MacWEEK, January 24, 1994

Specular Collage lets you quickly combine high-res images, without using a lot of RAM. Each image is a separate object—even after it's been blended with others. Layout images with the convenience of rulers, guides, image grouping and layers. Enhance your composition with a rich selection of effects such as transparency, automatic drop shadows, feathering, and Photoshop filters. Anything you do in Collage can be changed at any time, giving you total creative freedom!

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Mac-Integrated Telephony

DOES PLUGGING YOUR MAC INTO THE telephone grid make you think only of modems and fax modems? Macs can reach out and touch more than just fax machines and other computers. With the right add-ons, a Mac can dial customers in your contact database and leave them a message; a Mac can also be the hub of a voice-mail system, or of an automated fax-back system, which lets your customers dial in and get product brochures, technical updates, horoscopes, or whatever, sent to their fax machines.

Telephony is a hot trend in computing, and Apple is actively involved in it. Besides building telephony capabilities into the AV and Power Macs, Apple is enhancing the Mac's system software with support for third-party telephony software and hardware. While many of Apple's plans are still on the drawing board, here's a look at some useful ways a Mac can tie up a telephone line today.

Dial the Number

Once you have entered a phone number into a database, an E-mail message, a text document, or anywhere else, why should you have to dial it manually? Automatic phone-dialing can save your fingers from unnecessary walking.

There are a few routes to autodialing. Many personal information managers (such as Aldus TouchBase Pro) can dial using your Mac's modem, and you simply pick up the phone before the phone on the other end starts to ring. This scheme has several flaws. For one, it assumes that your modem and telephone use the same phone line—unlikely in any business employing more than one person.

Many programs can issue the tones needed to dial as you hold the telephone handset up to the Mac's speaker. But in my experience, this method works poorly—too many wrong numbers and incomplete calls. And, of course, you can't dial this way at all with phone systems that require pulsed dialing.

(To test the waters of autodialing, QuicKeys owners can take a look at the Phone Dialer extension. To find Phone Dialer, pull down the QuicKeys Extensions submenu, then the Network and Device Tools submenu.)

A better way to dial is to hook up an autodialing box between the Mac and a telephone. I tested two: Sophisticated Circuits' Desktop Dialer and Advanced Software's TurboDialer. Each has good and bad points. The TurboDialer connects to the Mac's sound-output jack, blocking the port for external speakers. The Desktop Dialer connects to the Apple Desktop Bus (ADB) along with your mouse and keyboard—a much more flexible scheme.

The TurboDialer can dial a number as soon as you select one, but the Desktop Dialer requires you to copy the number to the Clipboard, which adds a step to the dialing routine and replaces the Clipboard's contents. But to its credit, the Desktop Dialer can be driven by any program that can send Apple events, such as Claris's FileMaker Pro or Apple's HyperCard. Desktop Dialer also includes a bare-bones address-book program that stores up to 20 names and addresses. In all, it's the better of the two dialers, and most contact managers and other dialing-aware programs support it directly.

Area codes and long-distance access codes can be a problem. You want an autodialing program to dial the codes for long-distance calls but not for local ones. How does the program know which is which? Both dialers use a simple scheme, which begins with your entering the local area code in a setup dialog box. When you go to dial a number, the dialer's software checks the number's area code and doesn't dial it if it matches the area code in the setup dialog.

Both dialers also let you specify prefixes for accessing outside lines or long-distance services; you can insert a pause between the prefix and the number by typing a comma after the prefix. Both dialers also support the suffixes—your calling-card number—that many long-distance companies require.

Plug into the Grid

Apple is pushing telephony by building GeoPort connectors into the AV Macs and Power Macs. The GeoPort promises to do for telephony what LocalTalk did for networking: make the hardware connections easy and economical.

The AV and Power Macs have enough processing horsepower to perform the tasks of a high-speed modem or fax modem, so they need only a hardware interface to the telephone lines. That's where the Apple GeoPort Adapter comes in—it's a simple interface box that plugs into the GeoPort and connects the Macintosh to analog phone lines (the continue)
How Mac System Software Assists Telephony

Apple's Macintosh Telephony Architecture enables telephony products to work together, even those not designed specifically to do so, by using Apple events and the Telephone Manager extension to manage communication between the applications, drivers, and hardware that connect Macs and telephones.

At the Architecture's top layer are telephony-aware applications (1)—for example, a database that records order-entry information delivered by telephone, or a contact manager that looks up a contact's number and exports it to a dialer.

Apple events (2) carry messages between telephony-aware applications and telephony applications (3), such as an answering-machine program, a graphical switchboard, a voice-mail system, or an automated paging system.

The telephony application in turn communicates directly with the Telephone Manager extension (4), which then talks to telephone tools (5)—low-level drivers that control specific pieces of hardware, such as a modem or dialer (6).

If you use PlainTalk's voice-recognition, you'll be glad to know that the Ear Phone works with it. In fact, recognition accuracy with the Ear Phone is a bit better than with the Apple microphone, because the Ear Phone microphone is fixed at a constant distance from your mouth and because Jabra's engineers fine-tuned the audio levels.

Desktop Voice Mail

Like them or not, voice-mail systems are coming on strong. Dedicated voice-mail systems start at about $4000 and skyrocket into the six-figure range, whereas Mac-based systems such as Cypress Research Corporation's PhonePro and Magnum Software Corporation's TFLX (pronounced toe-flax) start at several hundred dollars (not including the Mac, of course). Neither PhonePro nor TFLX is limited to voice mail—other uses include calling numbers in a database and playing a recorded message (a doctor's office might use this to set up an automatic appointment-reminder system); automatic order entry (callers enter item numbers from a catalog, and the system records the order); or telephone surveys (the system plays multiple-choice recordings and callers press keys to respond).

Every voice-mail system is a program that plays a message, records a message, transfers a call, and so on in response to keys pressed by the caller. To tailor a voice-mail system to your business, you must create the program that tells the system what to do. PhonePro and TFLX take remarkably similar approaches to the programming task. Both provide graphical programming environments, so you continue...
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program by dragging and linking icons that represent tasks and functions, and the end result looks more like a flowchart than a computer program.

PhonePro normally includes a high-speed SupraFax Modem (from Supra Corporation) upgraded with a chip that enables the system to play outgoing messages. For recordings to get through the Mac's modem port, they must be compressed in a way that compromises fidelity. TFLX doesn't have this sound-quality problem. It uses custom hardware between the phone line and the Mac's sound-output jack. Outgoing sounds are decompressed and played at the Mac's standard 11kHz or 22kHz sampling rate, which yields dramatically better fidelity.

TFLX's programming language is also more robust than PhonePro's. This isn't that you can't program complex systems in PhonePro—you can—but TFLX's language gives you more ways to express yourself, telephonically speaking. On the downside, I found the TFLX software a bit rough around the edges; PhonePro has a more polished feel to it. Magnuson has created an impressive demonstration of TFLX. Call 818/701-5051 and ask for the TFLX demo. If you call after hours (Pacific time), you're connected to the demo automatically.

Telephony from Afar

Telephones are, by their nature, for communicating from a distance—the prefix tele comes from the Greek for "far away"—so it's no surprise that there are plenty of tools for accessing your Mac-integrated telephone system from outside the office.

• Remote access: With Apple's Apple Remote Access software (ARA), you can dial into the office network and use its printers, file servers, and E-mail. A remote network node can do anything a local node can do, albeit in slow motion; even with a 14.4-Kbps modem, accessing a remote network feels a lot like trying to run in a swimming pool.

• Remote control: Using ARA with Farallon Computing's Timbuktu Pro, you can actually control a remote Mac. From home, you can run programs on your office computer, open its documents, and see its screen—but again, in slow motion. Note the subtle but important difference between Apple Remote Access and Timbuktu: ARA gives you access to a remote network and its services, while Timbuktu Pro gives you access to a remote Mac; you can't control or view the screen of a remote Mac using ARA alone. (If you're on a budget, buy Timbuktu/Remote, which has fewer features than Timbuktu Pro but doesn't require ARA.)

The Trouble with Telephony

For all its promises, some aspects of computer telephony still have rough edges. For example, most people have separate lines for modems and voice phones, but Macintoshes don't support this basic requirement. Another problem is that Apple's GeoPort Adapter works only with analog voice phones. For example, most people have separate lines for modems and voice phones, but Macintoshes don't support this basic requirement. Another problem is that Apple's GeoPort Adapter works only with analog voice phones, and many businesses have digital phone systems. Apple has been saying that PBX-compatible GeoPort adapters would be available since the AV Macs were released last year, but none have appeared to date.

Finally, it's impractical and expensive to dedicate a Mac as a simple answering machine or telephone. Conventional phones, answering machines, and fax machines aren't able to go the way of the telegraph key. At least for the time being, computer-based telephony tools will supplement, rather than supplant, the phone equipment to which we've become addicted.

The best of Macworld 6—Best and Worst

Contributing editor IAN HEID has been writing about the Mac since its introduction. His latest books are Macworld Complete Mac Handbook Plus CD (1993) and Macworld Word 6 Companion (1994), both published by IDG Books Worldwide.
The Joule system was designed to meet a powerful combination of purposes. To provide system expandability, and module portability in a space saving tower that grows without desktop clutter, as easy as 1,2,3.

**Step One:**
Start with a Joule base drive. The base unit forms the foundation to future growth or functions independently. It includes a hard disk or removable drive, power supply, digital active SCSI termination, surge protection, AC outlets, shielded SCSI cable, and connections for a future storage system up to 28GB.

**Step Two:** To expand, simply stack extra storage modules one upon the other. Built-in connectors eliminate cables and hassles.

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**Innovative and compact. The Joule system sets a new standard for plug and play.**

Bill Leppo, President
Leppo Instruments

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**Complete Storage Module Choices — Great Prices**

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* Available as a Base Drive, call for prices.

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Graphing software exists for one simple reason: it's difficult to perceive meaning directly from numbers. By presenting numbers as quantities that you can compare, graphing software makes numerical information more meaningful. The earliest number systems reflect this: Roman numbers and Chinese numbers both, for example, display the number three as a set of three lines. The Sumerian way to tally ten cows was to put ten little clay models of cows in a clay box, an early form of the pictographs you see today in newspapers.

Modern incarnations of those ancient representations—bar charts, line charts, and pictographs—are available to nearly all Macintosh users; even word processing programs typically include modest charting modules. For professional charting and graphing (the terms are interchangeable) in the Mac software universe, there are two types of graphs. First are the ones you can create with the ever-expanding feature set of Microsoft Excel, the standard Macintosh spreadsheet program.

In the second category are graphs that require features that go beyond Excel’s limits. This category can be further divided into business and scientific...
offer sophisticated charting features

graphs. While both groups of products provide advanced charting features, there's a basic distinction between programs designed for business use and those designed for scientific use. For presenting small amounts of data in a visually interesting way (showing off yearly revenue growth, for example), business-charting packages are filled with features that let you highlight the message contained in your numbers. However, for seeking an underlying rule that unifies or explains lots of data covering a wide spectrum of time or other unit of measurement, scientific-charting packages offer advanced analytical capabilities that identify the significance of data and display its meaning graphically.

Whether your goals are business or scientific in nature, all commercial charting packages typically go beyond Excel (and also beyond the charting features of integrated packages such as ClarisWorks, Microsoft Works, and WordPerfect Works). The 11 charting programs Macworld compares will help you present your data in ways that Excel can't, or at least can't do easily.

What They Do That Excel Can't
Although Excel 4.0 ($495, Microsoft Corporation, 206/882-8080, 800/426-9400) has a solid range of charting facilities, plus Wizards that simplify the process of creating charts, it lacks several key features. For example, business users typically want a set of attractive, consistent formats that mix charts and

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text easily. They want these to be available in slide-show format, with an outliner for previewing and a player that allows for run-time versions of Mac-based presentations. For business users who need to present data in a formal setting, Chooser-selectable output formats for producing 35mm slides are also important. Microsoft recognizes the importance of these features, but it has bundled most of them into PowerPoint (its presentation package), not Excel. However, several companies have seized the opportunity and offer software with presentation-style charting.

Analytical charting often involves thousands of data points and requires specialized chart types. Excel's charting capabilities can handle only a few hundred data points comfortably. Although it's possible to perform curve fitting (which draws a best-fit line through data points automatically) and other types of data analysis in Excel, you must write your own formulas into separate columns in your Excel spreadsheet. In most scientific-charting packages, curve-fits and transforms are available as menu choices that plot directly with your data.

Strictly Business

Business charting, as a rule, involves much smaller and simpler data sets than scientific charting. It's rare to see as many as 40 data points in a business chart, while a science graph often has thousands of data points. Besides simply presenting data that shows, for example, sales projections, business charts should keep an audience interested. For that reason, business-charting software often contains sound effects or flashy graphics. Scientific charting is designed to focus on presenting data in the most accurate way, typically in black-and-white, two-dimensional formats that meet the publishing constraints of many scientific journals. Business charts call for color, shading, and extensive use of 3-D and pseudo-3-D formats; users often want to create slide shows rather than printed charts.

Astound 1.02 from Gold Disk ($399, 408/982-0200, 800/998-9888) is a good example of the dazzle-the-audience approach to business charting. It offers an adequate assortment of chart types (including 3-D versions of most charts), but it also provides in-chart animated figures, sound, and QuickTime movies. Gold Disk assumes that charts are typically going to be part of a slide show, so Astound offers different styles of slide-to-slide transition (fades, wipes, and other mock-cinematic devices, including sound effects). The user chooses the show's presentation style, which sets shadings, borders, bullets, headlines, and outlining.

In conventional charting packages, which are based on the idea that a slide show should pretty much resemble an annual report or diagrams from a business textbook, text and graphs are static. Astound, in contrast, allows text to float in from the sides of the screen or materialize from sparkling powder; chart elements can grow in sequence before the viewers' eyes. This is a long way from the plain black-and-white line charts that have been the foundation of business graphing since the time of Adam Smith's Wealth of Nations in the eighteenth century. Astound brings the excitement of multimedia to presentation software; this may be necessary to hold the attention of today's audiences (see "It's Alive").

While Astound takes an MTV approach to presentations, Computer Associates International's Cricket Graph III 1.5 ($129, 516/342-5224, 800/225-5224) offers no sound, no QuickTime movies, no animation, and a limited assortment of backgrounds and shading options, you'll find most of the fancy stuff in the company's Cricket Presents ($199) instead.

Cricket Graph is designed to produce business charts, and it does provide graphs that are aesthetically more pleasing than standard Excel charts, while requiring almost no training. Longtime Cricket Graph users claim that if you create charts infrequently, this relative lack of features (compared with Persuasion, for example) makes Cricket Graph easy to relearn. Fans of Cricket Graph also point out that if you will be distributing charts in print, black-and-white, most of the special effects in snazzier business-charting packages lose their impact anyway. If you're creating charts on the road using a PowerBook, Cricket Graph's compact size (less than a 1MB of hard drive space) is an asset.

New Chart Tricks

ClarisImpact has built in many variations on the basic business-chart styles. If you don't like these Modern pies (modern means labeled here), you can switch instantly to one of many variants.
**DeltaGraph Pro**

1. Business programs typically allow for a great variety of chart elements, some of which add confusion.
2. Most business-charting programs are organized around a slide-show format and make it easy to import sound and QuickTime movies.
3. Evocative backgrounds (often provided as templates) make a consistent tone in a chart presentation.
4. Business charts usually feature clip art, if only the company logo.
5. Where are axes? A science chart wouldn't allow this, but business charts often show data floating in space.

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**Imaginative Business Graphs**

ClarisImpact 1.0 ($399, Claris Corporation, 408/727-8227, 800/544-8554), the newest business-charting package for the Macintosh, represents an intriguing mix of features. Claris set out to accommodate every sort of picture used in business communication. Besides charting, Impact does organization charts, Gantt-style time lines, calendars, flowcharts, and fancy tables.

Although ClarisImpact at first appears to offer a limited chart repertoire similar to Cricket Graph’s, the basic data-charting facilities all have imaginative variations. So while you can of course call up a plain pie chart (called Trad Pie in the list of Impact choices), you can also try the flashier International Pie or Modern Pie instead (see “New Chart Tricks”). In short, every chart type in Impact’s basic gallery is equipped with options to enhance its visual appeal. You can add shadows to simple line charts for emphasis, mix snacks of different objects in pictograms, and add titles at rakish angles for all sorts of chart elements.

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**Best of Both Charting Worlds**

Astound, Cricket Graph, and ClarisImpact are designed for business graphs and don’t delve significantly into scientific charting. DeltaPoint’s DeltaGraph Pro 3 3.0.4 ($195, 408/648-4000, 800/446-6955), however, is a serious attempt to incorporate everything you could want in a single program, whether you’re creating business or science charts. Generally, DeltaGraph Pro 3 succeeds.

DeltaGraph has a variety of chart types ranging from basic business (bar, line, column, pie, scatter-plot), to fancy variants of those charts, to specialized scientific types (polar, XY vector, and so on). And you can select these from a dialog box that shows thumbnails of each type. It offers Smart Layouts, analogous to Persuasion’s AutoTemplates, which minimize your effort and promote consistency in your presentations. It incorporates clip art, Pantone-selected color palettes, and QuickTime movies. DeltaGraph also opens Excel files directly.

Finally, DeltaGraph supports AppleScript, so advanced users can write short AppleScript programs that, for example, open every data file in a folder and make identically formatted graphs for each file.

What makes DeltaGraph unique, however, is that it combines snazzy designer effects with math capabilities equivalent to those in the science-oriented programs. Although business users might never get around to adding error bars to data or fitting a sales curve with a spline, and engineers probably won’t put clip-art palm trees in the background of XY scatterplots, DeltaGraph puts these capabilities and more just a mouse-click away.

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**Make a Science of Charting**

Deciding which scientific-charting package to buy would be a lot easier if one program stood out from the others. However, there is no product you can quickly dismiss because it has a short feature list or an unfriendly interface. And while the programs all create many of the same charts, they are also quite specialized. Each program was developed by scientists whose particular background shows in the software.

SigmaPlot for the Macintosh 4.14 ($295, Jandel Scientific, 415/453-6700, 800/874-1888), for example, is produced by a company whose main product line is statistics software. As you’d expect, SigmaPlot
is especially competent at plotting statistical data sets. With its roots in analysis of the kinds of data sets that appear in population biology, biophysics, and chemical kinetics, the product is ideally suited to producing charts for scientific reference journals. This means uncluttered black-and-white graphs with an emphasis on curve fitting and data statistics designed to match scientific-journal chart-format requirements.

Produced by a company called WaveMetrics, Igor Pro 2.0 ($495, 503/620-3001) has, as you’d expect, the best set of tools for analyzing waveforms (typically, plots of time versus voltage, which are used to determine repetitive signals). Igor Pro has so many analysis features that it could be described as an electrical engineering program that also includes black-and-white charting. Besides FFT (fast Fourier transform) functions, Igor’s macro language supports statistics, peak fitting, and integration in spectroscopic chromatographic data (see “Advanced Charting”).

In contrast to most charting packages, in which the capability to open Excel files is considered a luxury, Igor Pro supports not just Excel files but also direct data acquisition from National Instruments’ GPIB boards. Although with enough tinkering with

**MAKE A SPLASH WITH YOUR GRAPHS**

When it comes to presenting information effectively and attractively, Persuasion ($495, Aldus Corporation, 206/628-2320) and Microsoft PowerPoint ($395, Microsoft Corporation, 206/882-8080, 800/426-9400) control the lion’s share of the Macintosh business-presentation market (see “Presentation Software That Delivers,” Macworld, July 1994). Although they’re not necessarily powerhouse charting engines like DeltaPoint’s DeltaGraph Pro 3, they include strong chart repertoires embedded in a slick presentation environment.

**Persuasion Adds 3-D Charts**

Aldus’s Persuasion has always offered a huge set of presentation templates, and now in version 3.0 it provides a large assortment of charts as well. If you consider every possible permutation of charts, Persuasion chart types number 80. The major charting enhancement to version 3.0 is the addition of 3-D variants (not just shading or adding depth) for every type of two-dimensional chart, combined with full rotation and perspective control.

With a little practice you can easily tinker with perspective and shade the appropriate data elements to either conceal trends that you don’t want your audience to notice or draw attention to trends you don’t want your audience to miss. You can hot-link data, presumably residing in a spreadsheet, to Persuasion charts using System 7’s subscribe feature; in turn, you can hot-link charts to word processing documents with the publish feature. Persuasion lets you overlay multiple elements on a single chart page, so it’s possible to create your own new chart types from Persuasion’s repertoire.

The real strength of Persuasion, however, is that its AutoTemplates have preselected fonts, shading, titling, and other elements that will make you look like an experienced designer, while requiring little effort or skill on your part.

**PowerPoint Hits 100 Graphs**

Microsoft PowerPoint is evolving according to Microsoft’s standard strategy: look over the feature set in your biggest competitor and find a way to integrate those features into Microsoft Office, a suite of applications that includes Word, Excel, PowerPoint, and Mail. PowerPoint version 3.0 was shipping as this was written, but since version 4 for Windows had already been introduced, it’s clear what features the Mac version of PowerPoint will have by midsummer. Version 4 for Windows adds several new chart types, including surface plots, radar charts, and doughnut plots (a kind of 3-D radar chart). For comparison with Persuasion, Microsoft counts 100 chart types in PowerPoint, although some of these are minor variants of each other. PowerPoint supports full rotation of its 3-D charts; as with Persuasion, you can be disarmingly honest or you can slyly fudge the way you present your data.

Features typically found in scientific-charting programs are now also available in PowerPoint. For example, PowerPoint offers curve fitting, error bars on chart data points, and computation of trend lines through data. The main improvement in PowerPoint, however, is the AutoContent Wizard’s automation of common presentation tasks (sales meetings, quarterly reports, and so on). You just pick a type and add a bit of content. Similarly, the Pick A Look Wizard offers a set of template formats to apply for presentation consistency. A new drill-down feature lets you call up hot-linked documents in other Microsoft applications during a computer-based presentation, so that you can marshal supporting details for an argument on the spot in response to questions.
color features and chart elements you could make an Igor plot look like a DeltaGraph business chart, the graphical and operational macro capabilities in Igor target the program clearly at advanced scientific users who aren't put off by programming.

**Charting the Really Big Numbers**

Spyglass Plot 1.0 ($295, Spyglass, 217/355-6000) is specialized for a unique function: charting very large data sets (see "Make Your Point"). It doesn't offer a large variety of chart types, but it can handle data sets of 32,000 columns by any number of rows, limited only by memory. Spyglass Plot churns up data quantities that the other scientific-charting programs simply choke on. (In business charting, 256 columns by a few thousand rows is considered a huge data set.) These monstrous data sets are stored in files in the supercomputer format called HDF (Hierarchical Data Format), and Plot reads these files directly. Spyglass Plot doesn't do 3-D: the company assumes you'll do your 3-D color contour plotting in its companion product Spyglass Dicer 2.01 ($695) and that you are using Plot for an XY view of data only.

**Advanced Charting**

Igor Pro incorporates a powerful C-like programming language that extends Igor's analytical charting powers beyond the built-in functions of other programs.

KaleidaGraph 3.0 ($249, Synergy Software, 215/779-0522, 800/876-8376) is the most general-purpose scientific-charting program. It handles data sets of up to 256 columns by 32,000 rows, imports data directly from Excel, and offers sets-plotting templates. What sets KaleidaGraph apart is a particularly easy-to-use implementation of curve fitting—you can define a large set of possible functions for curve fitting, and then compare plots of these model functions with your original data on a single plot. While it's possible to do this by workarounds in the other scientific-charting programs, KaleidaGraph makes it easy.

For charting features combined with serious math capabilities such as FFTs, you have two choices: SuperAnalyst 1.9 ($249, SuperSoft, 801/223-3356, 800/827-4351) or Igor Pro. Of the two, SuperAnalyst is the simpler and less-expensive program that offers not only basic charts, drawing, and overlays, but also advanced computational functions, such as autocorrelation. SuperAnalyst goes beyond most competitors in its Function and Analysis menus, which include a variety of styles of numerical integration, differentiation, and root-finding for functions obtained from original data sets by SuperAnalyst's built-in smoothing routines (moving and polynomial averages, and three kinds of splines, for example).

**Charting the Way**

It's probably not surprising that charting programs encompass such a variety of features and target audiences, given that charts are the most common and effective way to communicate any type of numerical data. From the venture-capital slickness of ClarisImpact to the analytical artillery of Igor Pro, a wide range of charting products pick up where Excel leaves off.

Make Your Point

That's 25,000 points, represented in this Spyglass Plot chart. Plot is useful mainly for two-dimensional views of the giant 3-D data sets handled by Spyglass Dicer and Transform.

Macworld contributing editor CHARLES SEITER has reviewed most of the programs here, and consults with a variety of scientific firms on presentation design.

**CHARTING SOFTWARE**

Because there are a number of charting programs that excel at producing specific types of graphs, to make our Editors' Choice selection we focused on programs that handle a wide range of chart types—both business and scientific.

DeltaGraph Pro 3 3.0.4 For most charting purposes, it's hard to fault DeltaGraph Pro 3. The price is right, the feature set is huge. It's easy to use, and you can hot-link data from Excel. DeltaGraph Pro offers not only the most-wanted features for business programs but the key features for scientific charting as well.

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Tips, Tricks, and Shortcuts

MICROSOFT WORD CAN CREATE TERRIFIC tables, but you cannot place them directly into Aldus PageMaker 5.0. Ken Kreshtool of Cambridge, Massachusetts, devised a workaround using the LaserWriter 8 printer driver, which PageMaker 5.0 requires. This latest generation of the LaserWriter driver lets you save your output as an EPS file, which is perfect for placing into PageMaker. Follow these steps:

1. In the Chooser, choose LaserWriter 8.
2. In your Word document, select (that is, highlight) the table.
3. In Word, choose the Print command. You want only the table saved as an EPS file, so in the first dialog box that appears, set the Destination option to File and check the Print Selection Only check box. Click the Save button, and in the next dialog box give a sensible name to the EPS file, choose Enhanced Preview (usually preferable to Standard Preview) from the Format pop-up menu, and adjust the other settings to taste (use balloon help for guidance). Click the Save button.
4. In PageMaker, use the Place command to place the table as you would any other graphic. The EPS graphic may fill the page on which you place it (Word doesn’t always clip the EPS image properly), but you can crop and move it as necessary after placing it.

This approach has two advantages over using Word’s Copy As Picture command. First, hairline rules print correctly instead of being converted to 1-point lines. Second, PageMaker remembers a link to the EPS file, so you can update your PageMaker table simply by editing the original in Word, saving it again as an EPS with the identical name as the previous EPS file, and updating the link in PageMaker. PageMaker even preserves all the cropping and moving you did after placing the first edition of the table in PageMaker.

Note: LaserWriter 8.0, which comes in the box with PageMaker 5.0, is buggy, although it seems to work fine for this purpose. The current version, LaserWriter 8.1.1, fixes bugs and improves functionality. It is available from online services and is included with Aldus’s Macintosh Filter/Driver Pack Plus, which also upgrades PageMaker 5.0 to version 5.0a ($9.95 from Aldus, 206/628-2320).

Gradient Trapping Update

The procedure presented in a sidebar in last June’s Quick Tips for trapping a gradient-filled object in Illustrator 5.0 and 5.1 is missing one important step. Although you can set the gradient-filled trap to overprint, the gradient fill does not overprint correctly, reports Bob Faulkner of Venice, California. The workaround is to save a copy of the finished illustration in Illustrator 3.0 format, and separate the 3.0 version with Adobe Separator, or place the 3.0 version in a page-layout program and separate it there. (Keep the original Illustrator 5.0 or 5.1 version in case you need to change it later.) Saving in Illustrator 3.0 format converts the gradient fill into an object blend (a series of paths), which overprints correctly. Alternatively, you can manually create a blend with the blend tool in Illustrator 5.0 or 5.1 (the same process works in FreeHand). Illustrator 5.5 includes a filter that automatically performs trapping, but the filter does not work with gradients, so the manual workaround still applies.

Hard Drivers

Please tell me if anyone sells driver software for hard drives that takes advantage of SCSI Manager 4.3 found in the 660AV, 840AV, and all Power Macs.

David A. Brown
Saratoga, California

Eight companies I contacted said their latest drivers take full advantage of SCSI Manager 4.3. The hard drive utility applications that install 4.3-compliant drivers range from the no-frills $49.95 FormatterOne Pro 1.0 (Software Architects, 206/487-0122) to the full-featured $199 Hard Disk Toolkit 1.5 (FWB, 415/474-8055). For a comparison of those and eight other hard drive utilities whose latest versions can install 4.3-compliant drivers, see “Hard-Drive Optimizers,” Macworld, March 1994. Of the companies listed there, Bering Industries says it is withdrawing from the Macintosh hard drive–utility market, and Golden Triangle did not return my calls.

continues
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DRIVE SPECIFICATIONS

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Fujitsu

COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

Circle 202 on reader service card
SCSI Manager 4.3 is the latest version of the part of the operating system that controls data transfer between a Mac and its SCSI devices. Theoretically, Apple could use a system extension to add SCSI Manager 4.3 to all Centris and Quadra models, but so far it has not done so.

The performance improvement you experience after switching to a 4.3-compliant driver could be anywhere from 0 to 30 percent, depending on many factors, including the following:

• The type of drive or drives you use
• How much data your applications transfer at a time (for example, opening and saving small word processing or spreadsheet documents will show less improvement than opening and saving color images and multimedia files)
• The relative quality of the software engineering in the old and new drives
• Cable quality (it is possible for poorly shielded cables to degrade performance by 500K per second)

### Sound-Input Cable

Realizing I needed a patch cord to connect my Quadra 840AV to my sound synthesizer, I examined the stereo plug on the Apple speech-recognition microphone that came with the computer. I was surprised to learn that it is nonstandard, and I'm unable to find one like it or even get information about it from Apple. Short of cutting the plug off my Apple microphone, how am I to obtain a patch cord?

David McDonald
Koloa, Hawaii

Although the Apple speech-recognition microphone has a nonstandard plug, you can use an ordinary patch cord to connect an audio source to the audio-input port of a 660AV, 840AV, or any Power Mac. The mike's extralong plug reaches deep inside the sound-input port to draw power for the mike's internal preamplifier. A patch cord doesn't need electricity, so its regular ¼-inch stereo miniplug need not reach the port's power lead.

### Dvorak Keyboard Layout

Where can I obtain software that will convert my keyboard to the Dvorak system through the Keyboard control panel?

Sara Neyer
Gillette, Wyoming

America Online and CompuServe both have several Dvorak keyboard-layout files, and so do user groups such as BMUG ($10/549-2684). All layouts adhere to the Dvorak layout for letters but put punctuation, symbols, and diacritics in different places (see “Dvorak Variations”). Detailed reasons for the differences accompany each free keyboard layout. You install a keyboard layout by dragging it to the System Folder.

In addition to switching keyboard layouts with the Keyboard control panel, you can use System 7's Keyboard menu, which is normally hidden. To make it appear between the Application and Help menus, use ResEdit to turn on the “Always show kybd. icon” option in the System file's Info resource.

### Express Modem Problems

I have heard the Apple Express Modem has problems, but I have yet to hear precisely what is wrong with it. The one in my Duo 230 fails miserably at high-speed file transfers using the Zmodem protocol. Is the Express Modem to blame? If not, what causes problems, and can they be fixed or am I stuck with a lemon? To the best of my knowledge, I have the latest software for my modem.

Aaron Hathaway
Santa Fe Springs, California

The Express Modem had a variety of problems initially (too numerous to list here), but the many sources I contacted agreed that version 1.1.2 of the software makes the Express Modem as reliable as any modem. That version was released last year for PowerBooks as well as 660AV and 840AV Macs and is available from Apple dealers and online information services, or as part of the System Update 2.0.1 disk from the Apple Order Center ($10, 800/769-2775, ext. 6717). (The Power Macs also use Express Modem software, and come with version 1.5.1.)

Your problem may be one that could afflict any type of modem. Maybe you need to change your communications program's modem-initialization string or its settings for Zmodem transfer. Get specific advice from the publisher of each communications program you use. For example, Software Ventures advises Express Modem owners to use the latest versions of its communications applications, MicroPhone II 5.0 and MicroPhone Pro 2.01. Where previous MicroPhone versions used a generic initialization string (which Software Ventures calls a driver) with the Express Modem, the latest MicroPhone versions have a special initialization string for the Express Modem (and individualized strings for other modems).

continued
With Inspiration’s Diagram view, quickly brainstorm ideas and visually communicate even your written documents. The whole name will go blank, but don’t fret. Press the enter key or click outside view. The renamed item will jump to the top of the window if you’re viewing by name. To increase an item’s alphabetic buoyancy, paste the blank line two or more times at the beginning of the item’s name.

Chris Bloomfield
Kelburn, Wellington, New Zealand

Finding Nothing in ClarisWorks

TIP There is a way in ClarisWorks database to find all records where a certain field is blank (or not blank). Use the Find command to create a find request, select the field of interest, and enter <==” to find all records within the field that are not blank. Making the same entry and checking the Omit checkbox finds records where the field is blank.

Charles L. Stang
Milwaukee, Wisconsin

Self-Updating Field Names

TIP When you are working with Microsoft Excel’s database commands and functions, such as Find and Extract, the field names (column titles) must be exactly the same in the database range, the criteria range, and the extract range. The most obvious way to assure this is to copy the field names from the top of the database range, to the criteria range, and to extract ranges. However, the database commands and functions will not work if someone later changes a field name in the database and neglects to recopy it to the criteria and extract ranges. Even if you always remember to recopy changed field names, another person using your spreadsheet may forget or be unaware of the potential problem.

To avoid this pitfall, simply use formulas at the top of the criteria and extract ranges. The formulas reference the field names in the database range. For example, suppose the name of the first field in your database range is in cell A2. If the name of the same field in the extract range is in cell F2, enter the formula =A2 in cell F2. Now any changes to the field name in A2 will automatically update cell F2.

Shane Devenshir
Walnut Creek, California

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to Quick Tips, Lon Poole, at the address listed in How to Contact Macworld at the front of the magazine (include your address and phone number). All published submissions become the property of Macworld. Due to the high volume of mail received, we’re unable to provide personal responses.


Orderly Finder Window You can easily force an item to the top of a Finder window without visibly changing the item’s name, like the items shown here above the divider line in the Apple Menu Items window. You paste a blank line (not a blank space) at the beginning of the item’s name. (Incidentally, the divider line is a sound file whose name is a string of hyphens and whose custom icon is a blank white graphic. The Show Clipboard item is an alias of the divider line.)

If you’re downloading files from a Unix workstation or mainframe, you may need to specify certain options along with the Unix file name. Try sz -w 2048 filename for text files and sz -e filename for binary files (replacing filename with the name of the Unix file you want to download). If you’re having trouble with the Unix telnet command, try the nlogin command, and vice versa. (This information is based on the ZTerm 0.9 FAQ by Les Jones, available on America Online and on the Internet through the comp.sys.mac.com and comp.sys.mac.app Usenet newsgroups.)

Also, don’t overlook the possibility that the problem may lie with the modem or communications program to which you are connecting.

Forcing Order Invisibly

TIP Forcibly reordering items viewed by name in a Finder window by putting spaces or punctuation marks at the beginning of the items’ names gets up my nose. It visibly pollutes the names and conspicuously messes up name alignment. Here’s how to invisibly force the order you want, as illustrated in “Orderly Finder Window.”

Open the Note Pad of a new document in TeachText or any word processor. Press the return key to create a blank line, select the blank line, and copy it to the Clipboard. Switch to the Finder, click the name of an item you want to appear at the top of its folder, press the up arrow key to move the insertion point to the beginning of the selected name, and paste. The whole name will go blank, but don’t fret. Press the enter key or click outside the name, and the name will spring back into view. The renamed item will jump to the top of the window if you’re viewing by name. To increase an item’s alphabetic buoyancy, paste the blank line two or more times at the beginning of the item’s name.

Chris Bloomfield
Kelburn, Wellington, New Zealand

Finding Nothing in ClarisWorks

TIP There is a way in ClarisWorks database to find all records where a certain field is blank (or not blank). Use the Find command to create a find request, select the field of interest, and enter <==” to find all records within the field that are not blank. Making the same entry and checking the Omit checkbox finds records where the field is blank.

Charles L. Stang
Milwaukee, Wisconsin

Self-Updating Field Names

TIP When you are working with Microsoft Excel’s database commands and functions, such as Find and Extract, the field names (column titles) must be exactly the same in the database range, the criteria range, and the extract range. The most obvious way to assure this is to copy the field names from the top of the database range, to the criteria range, and the extract range. However, the database commands and functions will not work if someone later changes a field name in the database and neglects to recopy it to the criteria and extract ranges. Even if you always remember to recopy changed field names, another person using your spreadsheet may forget or be unaware of the potential problem.

To avoid this pitfall, simply use formulas at the top of the criteria and extract ranges. The formulas reference the field names in the database range. For example, suppose the name of the first field in your database range is in cell A2. If the name of the same field in the extract range is in cell F2, enter the formula =A2 in cell F2. Now any changes to the field name in A2 will automatically update cell F2.

Shane Devenshir
Walnut Creek, California

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PowerPC Server Applications Arrive

Power Mac Software publishers are announcing applications for the PowerPC-based Workgroup Servers that can run many times faster on the Workgroup Servers than on any 680X0 Mac server, but they've only scratched the surface of the application possibilities.

Network application updates accompanied last month's Workgroup Server announcements, with publishers claiming big speed gains (see Networks news, July 1994). For instance, Dantz Development's Retrospect Remote 2.1, which comes bundled with the WS 8150 and 9150, operates up to five times faster than its predecessor. Aldus's Color Central 2.1 (due by summer), an Open Prepress Interface and printer server application, performs two to four times faster under PowerPC. And Aldus's Trap Wise 2.0 will operate at three to eight times the speed of the trapping application running on a 680X0 Mac. In the world of databases, Canto's Cumulus PowerLite 1.2 ($199) and Cumulus PowerPro (five users $1495) both offer a 200 to 300 percent speed boost over previous versions of those database managers; and EveryWare Development's Butler 1.3 ($1695; due in July) will bring users three to four times the speed of 680X0 Mac versions.

The performance gains sound impressive, but the truth is that the full potential of the new Workgroup Servers for server-based and client/server applications remains a mystery to developers. For example, Dantz discovered that Retrospect Remote 2.1 runs faster using compression and encryption than it does nonencrypted and uncompressed. So far nobody knows why.

Because developers are still learning the ropes, it's hard to pinpoint categories of applications likely to benefit from PowerPC's qualities. One thing is clear: if an application relies heavily on the AppleTalk protocol stack or other Mac OS-based networking capabilities, such as AppleShare or Apple File Sharing, don't expect much of a speed boost until Apple converts its AppleTalk protocol stack to run in native PowerPC code instead of in 68040 emulation. One product that won't have to wait for Apple's conversion is ACI US's 4D Server Universal 1.0, due this summer. 4D relies on the company's own implementation of AppleTalk, and ACI US has already rewritten it in native PowerPC code.

The direct memory access (DMA), instruction caching, and RAM caching that are possible with the PowerPC speed AppleTalk a little but not enough to overcome AppleTalk's fundamental speed limit. Apple acknowledges that the fastest networking applications will be based on other networking protocols, like TCP/IP or Novell's IPX, which boast much higher theoretical speed limits. (AppleTalk maxes out at 256 Kbps, while IPX and TCP/IP have proven themselves at much higher speeds.)

When developers and Apple have native software, the PowerPC could not only change the way existing applications are implemented, but also create new classes of networking applications that weren't possible under the power of the 68040. For instance, Aldus has announced Open Prepress Environment 1.0, a workflow manager for prepress applications slated to ship in the fall.

ACI US, 408/232-4444; Aldus, 206/622-5300; Canto, 415/431-6871; Dantz, 510/253-3000; EveryWare, 905/819-1173.—Margie Wylie
Two for Networked Faxing

Two recently introduced products allow users to share a modem for exchanging faxes. PSI's Faxnetwork server software ($99) turns any Mac on the network into a nondedicated fax server for any Class 2 modem. Client Mac software ($225 for five users) sends fax jobs to the server where they are spooled, processed, and sent, quickly freeing client Macs for other uses. For convenience, the server can also print out all incoming faxes on arrival.

4-Sight's Small Site ($995 for ten users, including a Zoom VFX V.32bis modem) lets Macintosh users fax multiple documents simultaneously from an application you call up with a keyboard command. Processing and logging happen locally. LineShare Lite from Stalker Systems, which is bundled with Small Site, allows the modem to be shared between fax and data applications (such as ARA). PSI Direct, 408/559-8344, 800/622-1722; 4-Sight, 515/224-0211.

—Margie Wylie

CD-ROM Network Guide

The network solutions guide to Mac network hardware, software, and services, once published by Apple Computer, is available from an offshoot of Pacific Bell in a new guise, as a CD-ROM. The first one's free, kids, until July 31. Thereafter it's $499 for four issues of the quarterly, called Re:Source Network Solutions. Each issue includes interactive articles, an extensive product-and-service database, collected spec sheets, and the option to order any listed product through an associated system integrator. Later this year look for an online version. Pacific Bell Information Services, 415/543-7593, 800/303-7247.

—Nancy E. Dunn

Modems Plug in to the Hub

Cabletron Systems and Xylogic have teamed up to develop a communications server that offers up to 28 high-speed modems and supports AppleTalk Remote Access Protocol (ARAP). Xylogics' Modimim, a $23,900 module that fits into Cabletron's multipurpose hubs, comes with 4 built-in V.32bis modems and room for up to 12 internal modems, which are priced separately. The remaining 4 serial ports can support up to 16 additional external modems, so you can use your existing inventory of modems or add new devices.

The Modimim's built-in ARAP support lets Macintosh users dial in using Apple's ARA client software version 1 or 2. The module also supports common Unix- and Intel-based PC protocols, including SLIP (serial-line Internet protocol) and PPP (point-to-point protocol). It can be managed via Simple Network Management Protocol, and it offers dial-back security. Cabletron Systems, 603/332-9400.

—Margie Wylie

ARA Made Easy

For only a few bucks per client, Apple Remote Access administrators can nurse the technologically hopeless and keep would-be intruders at bay while sharing the network's wealth with even temporary users.

Trilobyte Software's ARACommander 2.0 (1 user $35, 100 users $675) is a commercial upgrade of a respected shareware utility that adds a feature-rich, flexible, and secure interface to existing ARA client software (versions 1 and 2).

For users, the utility's control panel provides an easy way to automate dial-in times, application launch, and disconnection. Network administrators can use ARACommander 2.0 to create Connectors, small custom applications that execute log-ins. You can set up a Connector to dial a server automatically at scheduled times, launch applications, perform AppleScripts, and automatically disconnect after a specified idle time. Connectors also let administrators hide the network's wealth with even temporary users.

Trilobyte Software's ARACommander 2.0 lets you create Connectors, small custom applications that execute log-ins. You can set up a Connector to dial a server automatically at scheduled times, launch applications, perform AppleScripts, and automatically disconnect after a specified idle time. Connectors also let administrators hide the network's wealth with even temporary users.

—Margie Wylie

IN BRIEF

For Sun Servers Updated uShare 4.0 server software, which makes Sun Microsystems servers look and act familiar to Mac users, offers improved performance, supports AFF 2.1, and includes Mac-based administration. Built-in application mapping allows assigning double-clickable Mac icons to Unix and MS-DOS documents. Version 4.0 ranges from $595 for one user to $1395 for any number of Mac clients ($295 for upgrades). Information Presentation Technologies, 805/541-3000.

X-Windows Update An add-on module for White Pine Software's Mac 5.1 X-Windows client emulator, eXodus eXpress, lets eXodus users dial in to an X-Windows server at a speed that the company claims rivals Unix remote-access protocols, like SLIP and PPP. $99 per client module, plus $99 per module for each Unix host. Also due in late summer: eXodus for Power Macintosh ($259; $75 as an upgrade), a PowerPC native application. 603/886-9050.

ARA Commander automates ARA connections.
Public online services offer low-cost ways to link far-flung offices

A decade ago, your company had to lease a private phone line to connect its mainframe computer with the terminals and computers at its branch offices. Branch employees probably used low-speed lines to access the mainframe at speeds of 9600 bps to 56 Kbps. The data processing center may have leased an entire T1 circuit that funneled the traffic flowing in from the branches to a single 1.54-Mbps pipeline.

Today, most businesses still use private-line wide area networks to send data between far-flung locations. The reason: private lines provide maximum control over network resources, a high level of data security, and unlimited usage at a fixed price.

But the corporate computing environment is changing. The terminal-to-host scenario is becoming a thing of the past. LANs are becoming the norm. And connecting several LANs into a single, enterprise-wide network is becoming mandatory for companies that do business at more than one location. Network managers face the challenge of finding cost-effective methods to integrate their LANs. Network managers now have an alternative to dedicated private lines: public data services.

Public data networks use their own network-based services and equipment to route your data traffic along with traffic from other customers over a shared network facility.

A smorgasbord of public data services with names like frame relay and switched digital are now offered by long-distance carriers such as AT&T (201/606-2000) and Sprint Corporation (404/859-5000), local carriers such as Bell Atlantic (215/963-6000) and Pacific Bell (415/542-9000), and value-added network providers such as CompuServe (614/457-8600) and Infonet Services Corporation (310/335-2600).

The key to choosing the right service is to understand the LAN applications your company plans to run over your WAN. Before you start shopping, you should consider the following.

• Your connectivity requirements. How many LAN locations are you connecting—two, three, or more? Does each location need to connect to each other location in an any-to-any configuration? Do you plan to install network connections with customers or suppliers outside your company? Do each of your branch locations need to connect only to your headquarters office, or does each branch need to connect to each other branch in an any-to-any (full-mesh) configuration?

• Your volume of usage. On average, do your users transmit small, medium, or large files across the network? How much time does it take to transmit a typical file?

• Your data-transmission frequency. Is network traffic constant or intermittent? Do users send and receive files over the network all day long or only occasionally?

• Your need for speed. Do users send large image files over the network that will choke at slow speeds? Do they send database queries that require rapid response times? Or are most users transferring small files and sending electronic mail?

• Your disaster-recovery needs (automatic rerouting). Is a portion of your network traffic mission-critical? Will your company's business suffer if a network connection fails and your data is not automatically rerouted? Are you paying extra for disaster-recovery services?

Now consult the table "Where Public Data Services Make Sense" to see which data services match up best with your company's WAN needs.

• If you already have a private network in place, you might want to consider adding frame-relay or switched-digital connections at your branch locations but leaving your backbone network intact.
• If you're sending files from your remote offices back to your main office just a few hours each day, a switched-digital service is an economical choice.

• If you plan to connect the LANs at, for example, each of your four offices into a one-to-any (mesh) network, a frame-relay solution is a good bet.

• Or, if your company needs to exchange information regularly with its customers, business partners, or suppliers, a TCP/IP network could be your solution.

To understand the applicability of each type of service, consider their strengths and weaknesses.

Switched-digital services  Switched-digital services (sometimes called digital dial-up services) typically cost less than private lines if your data traffic averages less than two hours per day and your sites are widely separated.

Switched services work like regular voice calls. To set up a switched call, you simply dial a predetermined phone number and start sending data. The beauty of this system is that you're charged only for the bandwidth you need, only when you need it. A typical switched 56/64 Kbps (commonly called just switched 56) call from New York to San Francisco will cost you between $7 and $10 per hour—the same as or slightly more than what a voice call costs.

Switched services are a natural for remote offices that can't justify a private line or for telecommuters whose bandwidth needs exceed the upper limits of analog modem connections. Switched services can also augment private-line connections during peak traffic times or dial backup bandwidth in case a private line goes down.

If you plan to interconnect LANs using switched-digital circuits, you'll need a router or an inverse multiplexer to connect to the WAN. Inverse multiplexers let users aggregate multiple switched circuits into temporary high-speed pipelines. Instead of using individual 56 Kbps connections, for example, inverse multiplexers dial up as many as 24 56-Kbps circuits to bridge LANs or back up private lines.

If you are connecting individual Macs to switched services, you need to plug a Data Service Unit/Channel Service Unit (DSU/CSU) or an Integrated Services Digital Network (ISDN) terminal adapter into your machine.

Carriers offer switched services in bandwidths of 56, 64, 384, and 1536 Kbps. You can sign up for these services by calling either your local phone company or your long-distance carrier. But check prices carefully; in some cases you may find it cheaper to use your local phone company's switched service to connect to your long-distance carrier than it is to sign up for switched services directly from your long-distance carrier.

Frame-relay networks  Frame-relay services and LAN internetworking are considered by some people to be a match made in heaven. That's because frame relay, an updated version of X.25 packet switching, economically connects multiple sites in an any-to-any configuration and efficiently handles the high-burst data transfers that are typical of LAN traffic, imaging, and client/server exchange. Typical uses include financial data trans-
NETWORKS: Connect Your LANS

Frame relay works by breaking data streams into packets and then routing the packets to their network destinations over logical connections called permanent virtual circuits (PVCs). A company must set up PVCs between its different network locations before any one location can send or receive data from any other location. Requiring that a company predefine PVCs between locations before any communication can take place is what makes the data on your public frame-relay network just as secure as the data on your private-line network.

PVCs also make frame-relay networks cheaper to use than private lines for internetworking three or more LANs. That's because a single physical connection into a frame-relay network supports multiple logical connections into the network. A company connecting five locations into an any-to-any frame-relay network, for example, pays for one connection into the network for each of its five locations, for a total of five connections. A company connecting the same five locations into a private-line network, on the other hand, must pay for ten network connections, since each logical connection on a private-line network requires a physical connection as well.

To get started with frame relay, you need frame-relay-capable routers. Major vendors sell routers that support frame relay and AppleTalk protocols. Some companies report that using a frame-relay network costs 20 to 30 percent less than using a private-line network—enough to pay for the investment in routers during the network's first year of operation. Carriers such as AT&T, Compuserve, and WITTel (918/588-3210) offer frame-relay services at connection speeds ranging from 56 Kbps up to T1.

X.25 networks Frame relay's predecessor, X.25, is a low-speed packet-switching technology that is still widely used today for interactive, transaction-oriented applications such as order entry and credit card verification. Because of X.25's large network overhead, most X.25 networks operate at top speeds of 56 Kbps—too slow to effectively handle LAN-to-LAN traffic.

But don't rule out X.25 networks if you just plan to send electronic-mail messages and small files across wide area links. Companies like AT&T and Sprint use worldwide X.25 networks to provision their AT&T Mail and SprintMail global electronic-mailing services.

Also consider X.25 if you communicate with offices overseas. Its error-checking protocols make it effective in areas of the world where circuits are noisy and transmission errors are likely to occur.

TCP/IP services Recently, service providers like Advanced Network & Services (914/789-5300), Infonet, and Sprint have started offering managed TCP/IP-based routers that let companies connect their LANs to their customers' or suppliers' LANs or build customized TCP/IP networks via the public Internet.

Choosing a Provider Once you have harnessed the power of data services that suit your LAN applications, it's time to look for a service provider. It's also time to decide how much control you need—or can provide—over your WAN links. Do you have the staff and the budget to manage your own network, or will it be more economical for you to pay a service provider to manage your network?

For a fee, most service providers will completely take over the design and implementation of your network, including arranging for access lines from the local phone company and installing the equipment you need at each of your network locations. Once your network is operational, you can sign up for round-the-clock, seven-days-a-week network monitoring and management services.

For example, Sprint recently started offering managed network services for its SprintNet (X.25), SprintLink (TCP/IP), and Frame Relay Services. Depending on the complexity of your router setup, Sprint will design and implement your network for a one-time fee ranging from $250 to $1000 per network node. Ongoing service charges include on-site router-maintenance fees of between $40 and $150 per month and router-management services of $240 per month, per router. The company has said it plans to offer managed network services for its private-line and switched-digital services by year's end. (Other companies offer similar services at similar rates.)

MARTHA STRIZICH writes frequently about networking.
Introducing Mini EtherPrint: Up To 8 LocalTalk Connections, New Compact Size.

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Frequently Asked Questions

SOME QUESTIONS—NO MATTER HOW many times they’re answered—seem to get asked over and over again, either by new users or by people who haven’t found the right resources. One of these resources is Apple’s technical-support line for Macintosh users: 800/767-2775. With the cooperation of the support-line staffers who field such queries, I compiled the most frequently asked questions and answers about PowerBooks.

Q. Even when it’s plugged into the AC adapter, my PowerBook does not always start when I press the power-on button. What should I do?
A. Try a hardware reset. For 100- and 500-series PowerBooks, simply unplug the AC adapter and remove the battery, leaving it out for ten minutes. For Duos, press and hold the back power button for four to five seconds.

Q. What is the correct system enabler for my PowerBook?
A. Models 100, 140, 145, 145B, and 170 require no enabler. The other 100-series PowerBooks use Enabler 131 (131 replaces two earlier versions—Enabler 111, which came with the PowerBook 160 and 180, and Enabler 121, which came with the PowerBook 165c). The 200 series (Duos) use PowerBook Duo Enabler 1.0 (replaces Enabler 201, which was shipped with the early Duos 210 and 230). The 500-series PowerBooks use PowerBook 500 Series Enabler 1.0.2. The latest enablers are available through the usual sources: System Update releases, new system software releases, and many online services. You can also get them with the System Update 3.0 for $10 (credit card only); call the Apple Order Center, 800/769-2275. Although older enablers will still work, it is a good idea to update to the most current one.

Q. Why does my PowerBook sometimes become quite warm to the touch?
A. PowerBooks can heat up during operation, especially on the bottom beneath the keyboard and around the battery compartment during charging. To avoid overheating, leave the PowerBook display open and the feet down during operation, especially when using an external monitor. In some cases, a hardware reset (described above) may work.

Q. How do I get a frozen cursor unstuck?
A. First, wait a few moments to see if the PowerBook is just taking longer than expected to finish a task. If the cursor is truly stuck, restart the computer (see the manual for the correct procedure for your model). If the problem persists, you may have a conflict with a system extension; try booting while holding down the shift key, to turn off extensions. If this corrects the problem, you have to restore extensions one at a time to find the offending one and possibly change the order of extensions by renaming them. Or you may need to reinstall your system software because of a corrupted system file.

Q. What should I do when I connect an external SCSI device to my PowerBook and I see a diamond icon with a number or I can’t access SCSI-disk mode at all?
A. Make sure that you are using the proper cable. When connecting SCSI devices to a PowerBook, use the off-white Apple SCSI System Cable or equivalent (part number M2538LL/A). When connecting the PowerBook to another Mac using SCSI-disk mode, use the dark gray SCSI Disk Cable (M2539LL/A), which has 30 pins at the PowerBook connector (the square end), while the peripheral/system cable has only 29 pins.

Q. What does it mean when my PowerBook just stops and the screen goes gray?
A. The computer may have gone to sleep. Press the shift key to wake it up. Or the battery may have completely drained, which also induces sleep mode. If so, plug in the power adapter, let the battery charge for 15 minutes, and then try to wake it up. If this still doesn’t work, continue...
Q. What do I need to use my PowerBook outside of North America?
A. Apple's PowerBook AC Adapters automatically adapt for all common AC power voltages worldwide (90 to 260 volts). The power frequency (50/60Hz) does not matter. For many countries you will need a plug adapter, available at electronics shops, luggage stores, and airport shops. If you have a third-party AC adapter, check that its voltage range is appropriate for the country you're visiting.

Q. Why does my PowerBook crash so often?
A. Two likely possibilities: software conflicts or faulty third-party RAM. First make sure you are using the latest version of all your applications. You may need to replace your system software by doing a clean install from your system software floppy disks: (1) rename your System Folder to "old"; (2) take the Finder file out of that System Folder and put it on the desktop or in the Trash; (3) insert the Install Me First disk and restart; (4) choose Easy Install; (5) after system installation, copy your personal software (control panels, extensions, and so on) from the old System Folder to the new one, and trash the old folder. If you have a third-party RAM card, have your local service technician remove it to see if that corrects the problem.

Q. Why won't the battery recharge?
A. Make sure the power adapter is plugged into a live socket. Select Battery (Apple menu); a lightning bolt appears over the battery symbol during charging and disappears when charging is done. For a Duo with Type I batteries, be sure the battery is fully inserted into the computer. Type II or III batteries don't usually have this battery-contact problem, but if a Type II or III in a Duo 210, 230, or 250 doesn't seem to charge correctly, you need Duo Battery Patch, a free extension from the usual sources.

Q. Why doesn't my PowerBook sleep?
A. A PowerBook will not go to sleep (1) if there is background activity such as printing, file sharing, virus checking, or telecommunications; (2) if it's plugged into AC power and an external monitor is connected (it can dim the external monitor); (3) if AppleTalk is turned on in the Chooser; or (4) if "Don't sleep when plugged in" is checked in the Options section of the PowerBook control panel.

Q. Why does my active matrix display have dots that never go away?
A. An active matrix screen contains over 250,000 pixels. Because of the current manufacturing technology, a few defective pixels is common. If screen flaws interfere with your work, call the Apple technical-support line to find out if your screen qualifies for replacement (determined on a case-by-case basis).

Q. Why does my screen seem so dark?
A. You may need to adjust the brightness and/or contrast setting. To see if screen dimming has been activated, move the trackball/trackpad. Also, the screen automatically dims when the battery runs low; if this happens, plug in the AC Adapter. Some third-party power managers dim the screen at start-up; to inhibit this, check the settings appropriate for that software, or restart while holding down the shift key. Active matrix color screens do not have contrast adjustments (they don't really need them). Note, however, that all color screens are impossible to read in bright sunlight.

Q. Why do I see flickering, shadowing, and faint lines on my passive matrix screen?
A. Some flickering or shadowing is normal, but try adjusting the contrast and brightness, selecting Black & White in the Monitors control panel, or switching to a lighter desktop pattern (in the General control panel).

Q. What should I do if my external monitor's screen is blank?
A. Open the Monitors control panel. You should see images of two monitors: the PowerBook display and the external monitor. If you don't see the image of the external monitor, make sure the PowerBook is plugged into the AC Adapter, which is required for an external monitor. Make sure the video cable is securely connected and restart the computer. In the Monitors control panel, click (and hold) the Identify button. A large num-
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Thank you. And you. And you.
Q. How do I get my cursor to go to my external monitor? How do I invoke mirroring on my external monitor?

A. Check the Monitors control panel for the presence of a second monitor. You can change the relative positions of the monitors by dragging either monitor icon, so that you can tell which direction to move the cursor to go from one screen to the other. Video mirroring (showing the same image on both screens) is set in the PowerBook Display control panel.

Q. Why won’t my PowerBook read a floppy disk that I formatted on my desktop Mac?

A. Some extensions block reading floppies—restart and hold down the shift key until you see the message “Extensions Off.” Then try reinstalling the disk. Also, the disk may be damaged. Try formatting a floppy disk in your PowerBook and use that disk in your desktop machine. If that doesn’t work, have your floppy disk drive tested for alignment.

Q. I have an Express Modem installed. When I start up, why does the Fax Modem icon have an X through it?

A. The Fax Terminal Pref file (located in the Preferences folder in the System Folder) may be corrupted. A temporary fix is to throw this file away and restart, which automatically creates a new preferences file. This problem was corrected in version 1.0.4 of the Express Modem software. The current version is 1.5, available from the usual sources.

Q. How do I print to a StyleWriter from a Duo or a 500-series PowerBook?

A. For PowerBooks with only one serial port (Duos and 500-series PBs), you must disable AppleTalk. Then tell the StyleWriter driver that you are using the modem port. If you have an Express Modem installed, set Express Modem to Off in the Express Modem control panel. If you have a PowerBook Setup control panel, set Modem to Normal. If you are having trouble printing to a StyleWriter from a Duo Dock, get a hardware upgrade from your local Apple Authorized Service Provider. AppleTalk must also be disabled if you want to use the printer port of the dock.
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Not Your Father's BBS
FirstClass systems: online services for the rest of us

You know what a BBS is, don't you? It's an electronic bulletin board system. At one end is a Mac Plus and a couple of phone lines in some teenager's bedroom. You, modem junkie, are at the other. You can dial in to the BBS at any hour. By typing commands, you can read Monaco 9-point text describing 32-bit addressing schemes, download the latest version of MacArmyMan Pro, or post heated messages about the efficacy of mouseball cleaners.

Well, that's what a BBS used to be, back when the information superhighway was a couple of dusty bike trails. But times have changed. Courtesy of a remarkable program called FirstClass, the aforementioned BBS operators of America can now replace the boring scrolling text of yesterday with nifty clickable icons, just like those in America Online or eWorld. The backdrops are colorful, the icons are customized, text comes in all sizes and colors, and there are witty sound effects at every turn. For the first time, you can use a BBS without a degree from MIT.

A FirstClass BBS is multitasking, too. Even as you're downloading, say, a Bart Simpson sound file from the BBS software library, you can simultaneously read messages, type in live conversations with other members, and explore the service. (Try that on America Online.) Actually, that's a bad example; on a FirstClass system, you can listen to a sound without downloading it.

The content of FirstClass systems is eye-opening, too; instead of merely serving as a canvas for political user-group mudslinging, these BBSs offer things like faxing, efficient E-mail, and access to the mother of all BBSs, the Internet. And on most FirstClass BBSs, people go by their real names (Bill Smith, Jenny Jones) instead of coy handles (Mac Stud, DigitalDork). The content of FirstClass systems is so varied and useful, they almost make CompuServe look like a garage sale. In my first whirlwind evening, I searched the recipe database for dishes containing prunes, downloaded the complete transcripts of the "Monty Python" TV shows, and sent a fax. Later, I unearthed the entire Bible, Frequently Asked Questions about Seinfeld, 12 complete Shakespeare plays, the transcripts of every speech ever uttered by President Clinton, Apple Product Information, months' worth of David Letterman Top 10 Lists, 4.5 gazillion shareware programs, and enough other surprises to turn me into a gibbering digitalIdiot.

You may have trouble believing this, but digitalNation's information is all well organized and easy to find. You'll definitely have trouble believing this: except for the call to Virginia, digitalNation is free (up to 20 minutes a day; you can pay for more access). What's more, if you use digitalNation, you've just stuck your toe into the meganetwork called the Internet; you get your own Internet address, and you have full access to the torrent of messages that gushes through the Internet every day. (Sysop, Bruce Waldack, bless 'im; voice 703/642-2800; modem 703/642-0453.)

DesignLink
DesignLink is no digitalNation; it barely qualifies as a digitalSuburb. But despite its unassuming size, it's worth mentioning for the sheer cleverness of its purpose. It's a resource for art, design, desktop publishing, and photography types. Most of its shareware programs, imported Internet discussions, and announcements pertain to those creative pursuits: there's a calendar of art shows and contests, links to design-industry magazines and companies, and so on.

The heart of DesignLink, however, beats in its Portfolio folder, which makes brilliant use of a unique FirstClass feature. In this area, you double-click on the icons of actual artwork samples from photographers and designers. In seconds, the full-color picture appears on your screen. (You also have the option of downloading them at a low-res 72 dpi.) What an ingenious way for these artists to display their wares—and for clients to window-shop! (Free up to 20 minutes daily, $200 per year to put your artwork online; sysop, Ash Mehta; voice 510/930-6746; modem 415/241-9927.)
EastNet

EastNet is everything you ever wanted in a BBS—in 100 BBSs, actually. Its most noteworthy feature is that it links to other BBS systems. Several of EastNet’s icons are actually gateways to such worlds as OneNet (a worldwide network of 300 FirstClass BBSs) and, of course, the Internet. Needless to say, you could spend a lifetime exploring all these spokes of the EastNet wheel, but some of the most interesting are Off White and Green (psychiatry), the Missing Children’s Network (double-click to see the photos of missing kids), and InvestNet (with online graphs of individual stocks).

According to Michael Wechsler, his co-sysop Robert Knowles “needs some therapy; he’s a file pack-rat.” Translation: this BBS also has, quite probably, every Mac shareware program ever written. Everyone has access to 20,000 of them; for an extra $10 per year you can also access six CD-ROMs’ worth, and Rob will hunt through his 25 gigabytes of programs if there’s something special you’re looking for. ($20 per year, $10 additional for Internet access; voice 718/575-1318; modem 718/767-0157.)

Earth Spirit Online

If you get so addicted to this stuff that you never go out and enjoy the fresh air and sunshine, at least you can read about fresh air and sunshine. Earth Spirit is an extraordinarily comprehensive, coherent, upbeat environmental BBS. On it you’ll find discussions, announcements, and files that touch every conceivable aspect of recycling, research, environmental politics, camping, health, and so on. There’s even an area where people analyze each others’ dreams. (Actual reply: “My interpretation of your dream is that you were wishing for a nice salad.”)

Greenpeace, the Sierra Club, and various California eco-oufits are there, as are several dozen imported relevant Internet discussions. Even I, a Manhattanite who hasn’t seen plant life in eight years, found something I’d been looking for: a decent definition of postconsumer recycling.

A bonus: For some reason, environmentalists don’t have the same appalling spelling and grammar of most BBS patrons. (Free up to 30 minutes daily; sysop, Robby Greenhood; voice 310/582-8228; modem 310/264-4785.)

User-Group Systems

Since BBSs are user-driven, noncommercial enterprises, it stands to reason that several of the best are associated with user-driven, noncommercial outfits—Macintosh user groups. (To locate the one nearest you, call 800/538-9696.)

These BBSs harbor the usual FirstClass riches: E-mail, discussions, Mac answers, selected Internet discussions, and the inevitable boxcarful of shareware. But the geographical relevance of user-group BBSs gives them a special zest. For example, on the Los Angeles system, there’s an icon called L.A. Eats, which suggests good L.A. restaurants. BMUG Boston (the East Coast wing of the famous Berkeley, California, user group) has press releases about Senator Kennedy. And the New York system, naturally, includes news of Broadway and the museums.

You’re welcome to look around these services for free, even if you’re not a member; but your time and access are limited until you pay up. (LAMG membership $16 per year; voice 310/278-5264; modem 310/559-6227. BMUG membership $40 per year; voice 510/849-2684, Planet BMUG [the main BMUG system] modem 510/849-2684; BMUG Boston modem 617/771-5840, NYMUG membership $45 per year; voice 212/473-1600; modem 212/473-1967.)

The Upshot

These friendly, info-dense services are as dramatic a Mac development as, say, the invention of the mouse pad. Why don’t we hear more about them? The pundits can finally quit ballyhooing about how hard the Internet is to use—if you connect through a FirstClass BBS, using the Internet is no more challenging than double-clicking a folder.

In short, the quantity and quality of the stuff you’ll find in this welcoming cyberland is astounding. After you’ve visited a few of these magical places, you’ll either be stricken with Information Anxiety—or cured of it.

Research assistance by Omar Wasow of NY Online (voice 212/759-5881) and Dallas Kachan of SoftArc (voice 416/299-4723).

Contributing editor DAVID POGUE is the author of More Macs for Dummies (IDG Books Worldwide, 1994), which contains, among other things, step-by-step instructions for getting onto the information superhighway without missing your exit.
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Annoying Technology

I found it an annoying piece of technology. En Passant has two components: a series of 21 digitized shopping catalogs from well-known junk-mailers to the yuppie trade, the usual suspects from Patagonia to The Pottery Barn, and a set of "departments," which consist of a few screensfulls of multimedia content seemingly digested from old airline magazines and trashed Learning Annex course guides. I sampled the departments first, poring through several video-bits of canned wisdom by the likes of Tom Peters. ("Update your résumé every 90 days," he said, jerkily waving his hands in a QuickTime clip.) Then I skipped through a feature about neckties where I learned my tie should say, "Me." All of this, filtered through the sluggish through-rate of CD-ROM technology, was like an infomercial on quaaludes.

Then I tried the catalogs. In theory, multimedia catalogs have advantages—you can get multiple views of items, seeing them in different colors, for instance. Or you can hear snippets of recordings. Or you can get pop-up calculation devices that figure out sizes and such. It is essential to provide lots of these goodies, because computer catalogs suffer inherent drawbacks—they require a more focused attention, you can't flip pages and make serendipitous discoveries, and you can't read it on the toilet. En Passant falls short in these compensatory features. Though some items are supplied with sounds, there is little in the way of imaginative presentation. When a blouse is offered in six colors, why not let us change the colors we see?

The most useful component of En Passant is the Directory, which lets you go cross-retailer to choose items. For instance, if you're interested in necklaces, the program instantly compiles a custom catalog with items from The Horchow Collection, Tiffany's, The Nature Company, Pastilles, and the New York Museum of Modern Art. Still, Apple admits that the catalogs provided here are skimpier than the ones that are delivered to your mailbox. It's almost like getting a catalog with half the pages torn out.

In the Apple Catalog component, for example, I looked at the item for replacement LaserWriter cartridges and found that the En Passant disc only offered cartridges for the Select series—unlike the old Apple Catalog, which offered replacements for the entire range of Laser-Writers. And the price was higher, too—in En Passant you get no discount for ordering three.

And if you do want to order something from the En Passant catalog, you can't simply press a button and have your modem call up the service and automatically buy the item—you have to call up or fax your order the old-fashioned way! (An Apple spokesperson says that future versions might allow you to order directly.)

Mall of America Online

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covered that AOL charges the customer for shopping time. (Its main competitor does not: visit CompuServe's virtual mall, and you're off the clock.) The next shock came when I actually tried to find something I wanted to buy.

I headed right for the AOL Online Bookstore, run by a company called Read USA. After my name, a note informed me that every book was sold at a discount price. The most recent Philip Roth book had just come out in softcover, so I tried to locate it with the search function, looking for the keyword Roth. The only response to my query was *Harriet Roth's Fat Counter*. This seemed odd only until I looked deeper into the Online Bookstore and discovered that aside from a relative profusion of computer books, its selection couldn't compare to your average garage sale. Literacy was at a premium, too. In the biography section there were all of 16 books, with 3 devoted to Princess Diana and 3 to Ross Perot. Even the categories betrayed a suspect sensibility—there were separate sections for fiction and literature.

eShop of Horrors

I would like to report that we can expect much better shopping alternatives when the new generation of personal digital assistants come online, but judging from a demonstration I had of eShop, the electronic shopping component geared to the General Magic operating system, I think there will be a shakeout period. Simply reading the eShop press release, which promises "technology that allows merchants to create exciting, personalized shopping experiences for consumers," made my heart sink. Don't they understand? When we sit in front of our computer screens or stare at our blurry little PDAs, we don't see ourselves as experiences. If we did, we'd leave the house and go to a store! The whole idea of shopping electronically? Don't people buying tennis rackets usually want to, you order it online, and CDC tries to get it for you (the service claims a hit rate of over 90 percent). The commands on the system are Spartan but effective. When you find the disc you want, you can, with a keystroke, get a list of the songs it contains. Many of the CDs are subjectively rated by a star system, and some have short reviews. Often, CDC sells its wares at a discount.

When I accessed CDC through its Internet address (cdconnection.com), I got hooked instantly. Though it is not flashy—no videos of Tom Peters here—and though it makes no claims to be an "experience," Compact Disc Connection provides utility that En Passant has yet to attain. When I get my wireless PDA, Compact Disc Connection will be on the speed-dialer. I want the same sort of service for books, too, as well as other sorts of items. For instance, instead of the lush graphics of an L. L. Bean catalog on CD-ROM, I'd prefer to call up a database that lists everything Bean has ever sold—just in case I want to order a sleeping bag in a hurry. When it comes to shopping electronically, high-bandwidth selection and a quick in-and-out is the future. Spare me the frills, please—I just want to shop till I stop.

THE ICONOCLAST

STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).
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How to cope with a sad Mac

One Company's Choice

Although SRI International of Menlo Park, California, has hundreds of Macintoshes, materials coordinator Anita Ledtje doesn't believe it's cost-effective to buy service contracts. "Most Apple products are up and running until the time we unplug them," she says. "The PowerBooks have a hard life, but we don't have that many problems. If we paid for service contracts, it would put us into a hole."

Ledtje's job requires her to eliminate headaches before SRI buys equipment and after, she says. "That's why it's very important to have good service and support." But keeping SRI's Macs in good repair is not easy. Earlier this year, for example, Ledtje sent a PowerBook 170 to a local ComputerLand for a floppy drive repair. Because SRI material is often sensitive, the hard drive was completely erased before it was sent for repair and had to be started up from a floppy-based System. Though Ledtje had explained the situation, a technician called to report a problem with the hard drive. Ledtje tried to explain the situation once more; even so, the PowerBook was returned with the floppy drive still broken.

Next, Ledtje tried Hewlett-Packard, a company she loves for its customer service. When an SRI employee had several problems with his Duo 230, Ledtje楼宇 up the Duo and Minidock and sent them to the HP facility in Austin, Texas. "The Minidock had been fixed, but nothing else worked," says Ledtje, who waited two weeks for the Duo's repairs. "The latch didn't latch; the return didn't return. The Duo was visibly broken." Ledtje negotiated a much lower repair fee from HP, given the result, and in the process learned that HP doesn't repair Macs itself but contracts the work out.

Then an SRI researcher dropped his PowerBook 170, and Ledtje got nervous. She was running out of repair options. The researcher suggested Macadam, a San Francisco Apple dealer he heard about through a local user group. Macadam gave Ledtje the needed service, and owner Tom Santos made the repair process fast and easy.

Dealers versus Independents

Jeff Bierly, co-owner of Atlantic Computer Systems of Toms River, New Jersey, warns against using independent service providers that do component-level repairs, because subsequent repairs may be more expensive. That's because Apple charges two different prices for parts: one for refurbished parts, based on a trade-in program where dealers send the defective part to Apple; and another, much higher price for brand-new parts. If you use an independent for one repair but must go to a dealer for another, you may pay a price penalty.

Still, the gamble can be worthwhile. The price difference between independent and authorized dealers can be dramatic. ComputerWare in San Francisco charged just over $800 to replace a faulty Quadra 700 logic board, for example, while 800-We-Fix-Macs (408/988-2334, 800/933-4962) charges $429 plus shipping. The five-year-old Santa Clara, California-based company charges flat-rate continuing...
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 fees for repairing motherboards, PowerBooks, floppy drives, monitors, and other peripherals. Other established independents include MicroDoc (503/344-5335) and Soft Solutions (503/461-1136), both of Eugene, Oregon.

If you prefer to do it yourself, two books by Larry Pina are invaluable. The Dead Mac Scrolls (1992, Peachpit Press) describes Mac symptoms, offers probable diagnoses, and suggests solutions. It's particularly useful for folks who don't plan to do their own repairs but want to avoid repair rip-offs. Mac Classic & SE Repair and Upgrade Secrets (1993, Peachpit Press) shows the technically talented how to repair common problems with these compact Macs. (For more info, contact Peachpit at 510/548-4393 or 800/283-9444.)

A Service Checklist

If your company is too small to field in-house repairs, or you simply find it more cost-effective to go outside, use this checklist to compare service offerings.

- How long has the company or service center been in existence? Although there are exceptions, older businesses may be more stable than start-ups.

- What are the qualifications of the repair technicians? They should be Apple-certified. Certification doesn't guarantee that technicians are highly skilled in repair, but it does mean that they should be able to diagnose any faulty hardware and swap it out if not repair it on the spot. Apple trains techs to locate hardware problems and then replace malfunctioning parts with refurbished ones.

- Is there a fee if no problem is diagnosed? Many companies charge to diagnose a problem, whether or not they find one. In some cases the fee may be applied to the repair bill if a problem is found.

- How long is the warranty? Apple offers a 90-day parts-and-labor warranty on repairs. Independents often have warranties of six months or more.

- What is the turnaround time? It will probably vary depending on work load and staff levels. Some companies offer same-day, while-you-wait service or premium 4-hour on-site response programs. Claims of 24-hour and 72-hour turnaround times are not uncommon; find out what that means. For example, 24 hours may mean that if a company receives your computer on Monday, the Mac will be repaired and shipped out on Tuesday via second-day air, so you get your machine back on Thursday.

- Compare prices. Charges vary by dealer, service, and region. If you know the problem is, say, a dead monitor or broken floppy drive, compare ballpark estimates over the phone. Dealers usually charge a one-hour minimum plus parts: independents often charge a flat fee. But price is not the only consideration. As Anita Ledtje notes, "I'm buying for a business. I'll pay more knowing a company will be here when we have problems."

- If you are considering an independent, ask about inventory and the source of parts. Independents sometimes buy gray-market parts because Apple won't sell to independents directly. As a result, some parts may be tough to locate, which might slow down your repair.

- Does the company offer any special services or programs? 800-We-Fix-Macs offers toll-free technical support. Loaner programs are rare, but customers with clout may be able to negotiate for a loaner computer during the repair period.

- Ask for references and call them. See how the company's claims match the experience of its customers. And check with user groups or online service to get a feel for the company's reputation.

One last thing—when you take an Apple product in for repair to a dealer, ask if the product is covered by an Apple repair-extension program. Apple notifies dealers, though not usually owners, when a particular product will be repaired free of charge beyond its warranty period because of manufacturing problems. Until August 15, for example, Apple is supplying free ROM upgrades for Personal LaserWriter NTRs with certain symptoms. Ask your dealer for details.

Reader Jean-Yvan Fradet of Montreal writes in praise of Data Memory System. After buying four 2MB SIMMs, Fradet found one was defective, so he called Data Memory's tech support for help. "The guy there told me the company would ship me four new SIMMs," writes Fradet. "He told me to try them to see if they worked before returning the four previously shipped to me." Data Memory apologized for the problem and refunded the postage fees for returning the first SIMM order; our reader was dazzled by the prompt replacement of a defective product.

Send nominations for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107 or via Internet (Branscum@AOL.com). Conversely, drop Conspicuous Consumer a line if a company is ignoring you.
BUYERS' TOOLS

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in Macworld's comparative articles. A next to a product indicates that we chose more than one product in that category. A next to a product listing indicates that a native Power Mac version is available.

**Hardware**

### Monitors

**Black-and-white monitors, May 93**

- Portrait monitor: 15-inch Gray Scale Portrait Display, Mirror Technologies, 612/634-4490; $399, with video-display board $449.
- Two-page monitor: L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398. MD 202 Two Page Display, Mobius Technologies, 510/654-0956; $699, with video-display board $798.

**Color monitors, Oct 93**

16- and 17-inch: ErgoView 17; Sigma Designs, 510/770-0100; $1349. MultiSync SFG; NEC Technologies, 708/860-9500; $1395 (NEC's estimated dealer price).

**Small color monitors, Jan 94**

- 14-inch display: Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. NanoFlexScan F3400W; Nano USA, 800/800-5202; $799.

**Network Hardware**

**High-speed fax modems, Oct 93**

- Telescop Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $409, Silver $429.

**Powerbook tools**

- Duo docking connectors, Feb 93

Powerbook: DistNet; E-Machines, 503/646-6699; $499.

- External hard drives, Feb 93

- 2/4/6/8 MB: Companion 120; APS Technologies, 800/874-1428; $599. PocketDrive 120MB; La Cie, 503/520-9000; $699.

- Internal fax modems, Feb 93

- PowerModem series, PSI, 408/559-8544; $195 to $495. PortaPoint series; Global Village Communication, 415/390-8200; $229 to $499.

**Printers**

**Color printers, Aug 94**

- Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; $719.
- Solid ink-jet: Phaser 300i; Tektronix, 503/682-7177; $999.
- Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7177; $999.

**Dye-sublimation printers, Jul 94**

- Prepress proofing: tableoid size: fastest: Phaser 480; Tektronix, 503/682-7177; $15,995.
- Prepress proofing: tableoid size: most complete: Rainbow; 3M, 612/223-1110; estimated street price $27,000.
- Prepress proofing: letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $799.

**Personal printers, Sep 93**

- Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $399.
- QuickDraw Laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

**Workgroup printers, Feb 94**

- High-speed: Hewlett-Packard 45MX; Hewlett-Packard, 800/752-0900; $5499.

**Scanners**

**Low-cost color scanners, Nov 93**

- $1800 to $1600: La Cie Silverscanner II; La Cie, 503/520-9000; $1599. Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.
- Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/615-4150; $1299.

**OCR, Nov 93**

OmniPage Professional; Caere Corp., 408/395-7000; $995.

**Systems/storage**

**Double-speed CD-ROM drives, Jul 93**

- Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.

**Budget choice:** NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

**High-speed hard drives, Aug 93**


**SCSI-2 adapter:** QuickSCSI PLI, 800/288-8754; $499.

**Macintosh upgrades, Jun 93**

- SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; EasyStar Digital, 408/967-2077; 50MHz $999, 33MHz $499 (without FPU).

**LC and LC II upgrades**

- MacII accelerators: Radius Rocket 25/33; Radius Rocket 33; Radius, 408/444-1010; $51999, $32499.
- Universal PowerCache series; DayStar Digital, 408/967-2077; $449 to $999.
- IIFC SCSI accelerator: QuickSCSI PLI, 800/288-8754; $499.

**Quadra static-RAM cache card:** FastCache Quadra; DayStar Digital, 408/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

**Optical drives, Dec 93**

- 3.5-inch: Epson OMD 5010; ClubMac, 800/258-2622; $959.
- 128 MB: APS Technologies, 800/874-1428; $899.
- 5.25-inch: Sharp YJ-750; ClubMac; 800/258-2622; $1199.
- Infinity Max Optical 11m; Peripheral Land Inc., 800/288-8754; $4113.

**Video/display**

**24-bit video cards, Apr 94**

- Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $499.
- Full-featured acceleration: Thunder II GX1360; SuperMac Technology, 408/541-6100; $4999.

**High-end video editing, June 94**

- Presentation video: MoviePack2 Pro Suite; RasterOps, 801/785-5750; $4199. VideoVision Studio; Radius, 408/434-1010; $4499.

- Corporate video (offline): Media Composer 400; Avid Technology, 808/600-6789; $14,995.

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BUYERS' TOOLS

Corporate Video (Online): VideoCube: ImMix, 916/272-9800; $40,500.

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius. 408/434-1010; $999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business systems: MYOB; Teleware, 201/586-2200; $199.
Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: STATIST 5.2.1; STATIST, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

COMMUNICATIONS SOFTWARE, Aug 94
Basic connectivity: ZTerm; David P. Alverson (no phone number available); $30.
Terminal emulation: ConMark for Macintosh; Digital Communications Associates, 401/442-4000; $195.

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
FaxIt; Telescan, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license; $2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94
EtherPeek, AG Group, 510/937-7900; $795.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm: Synergy Software, 215/779-0522; $149.

GRAPHICS

3-D DESIGN, Aug 93


CLIP ART'S GREATEST HITS, Jan 94

DRAW PROGRAMS (LOW-COST), Sep 93
Beginners’ program: Aldus SuperPaint: Aldus Corp., 619/598-6000; $149.95.
Overall: Canvas: Deneba Software, 305/596-5644; $399.

FONT BUYERS’ GUIDE, Mar 94
Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400; 800/682-3623; $99 (includes the ability to unlock two families from preselected packages plus $25 to unlock individual faces or $69 to $179 for unlocking families).
Display/decorative-face collection: HotMetal; Letsel, 201/895-6100; $39.95 per face.
Bargain collection: Monotype ValuePack, Monotype, 312/655-1440; $89 for 57 fonts.

IMAGE DATABASES, Oct 93
+ Aldus Fetch 1.0; Aldus Corp., 206/678-5749; $299.
+ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1500; $249.

PAINT AND IMAGE-EDITING, Sep 93
Paint and Image-Editing: Type On Call CD-ROM; Adobe Systems, 415/961-4400; 800/682-3623; $99 (includes the ability to unlock two families from preselected packages plus $25 to unlock individual faces or $69 to $179 for unlocking families).
Display/decorative-face collection: Fontek; Lettsel, 201/895-6100; $39.95 per face.

OVERALL PROGRAM: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $1499.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClaireWorks; Claire Corporation, 408/772-8227; $299.

Vendors: Please write to Macworld Editors’ Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product’s list price.

ONLINE SERVICES

ONLINE SERVICES, Aug 94
E-mail: America Online; America Online, 703/893-6288; basic monthly fee: $9.95.
Reference: CompuServe; CompuServe Information Service, 614/457-0828; basic monthly fee $8.95.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: First Things First; Visionary Software, 503/246-6200; $79.95.
Smart Alarms Plus; IAM Software, 203/630-0095; $75.
All-around scheduler: Now-Up-To-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/634-1400, free pack $49.50.

GRAPHING SOFTWARE, Aug 94
DeltaGraph Pro 3.0.4; DeltaGraph, 408/618-4000; $195.

SALES-AUTOMATION SOFTWARE, Oct 93
Contact Ease; WestWire, 619/274-5053; one user $395, five users $1495.
+ CBS; Colleague Business Software, 512/345-9964; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small systems: On Location; On Technology, 617/374-1400; $129.
Multiluser system: Personal Librarian, Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94
Perussion 3.0; Aldus Corp., 206/622-5500; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.
Book-length documents: FrameReader: Frame Technology, 800/843-7261; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPoint: GD1 Softworks, 604/291-9131; $149.

VIRUS KILLERS, Jul 94
Commercial software: Vxers, Datawatch, 919/549-0711; $99.95.
Free software: Disinfector; free from online services.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, June 94
Virtual memory software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.
Memory Boosting Software; RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99.
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If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to Macworld Star Ratings, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

4D First 1.0, ACI US, 408-252-4444, $295. This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

Acrocrat Exchange, Acrocrat Distiller, Adobe Systems, 415/961-4400, $195 to $2495. Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

@Risk 1.1, Palisade Corp., 415/802-5800, $599. A well-structured program has most of the functions or you work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

BaseMap 1.0.1, Geopoint, 415/957-1560, $149. For simple maps displaying simple data, this mapping tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

ClarisWorks 2.0, Claris Corp., 408/727-8227, $399. Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

Common Ground 1.0, No Hands Software, 415/802-5800, $189.95. Simple, robust document-interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

Cricket Graph III 1.5, Computer Associates International, 516/342-6000, $129. Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

DeltaGraph Pro 3, DeltaPoint, 408/468-4000, $195. At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94

EasyFlow 1.1, HavenTree Software, 516/544-6035, $229. The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93


Helix Tracker 1.0, Helix Technologies, 708/465-0242, $439. Well-designed workgroup-document manager has strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $495 per client. Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

Map II 1.5, TrustSpace, 519/661-4006, $395. Well-structured product has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $595 to $1995. Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

Memorizer 2.0, Brains Software Engineering, 432-231-2897 (Austria), $100. Software records dictation and you transcribe it in a word processor. You may prefer to stick with a handheld tape recorder, considering the product's RAM and storage appetite, and its propensity to crash. Aug 93

Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695. When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

Microsoft FoxPro for Macintosh 2.5, Microsoft Corp., 206/882-8090, $495. Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data, it offers excellent performance. Apr 94

Office Tracker 1.1, Millum Corp., 512/327-2235, $195 to $995. The efficient user interface of this software sign-out, board in both single-user and networkable versions, makes it easy to learn and use: but it has some minor flaws. Dec 93

Pablo 2.0.1, Andrzyme Computing, 613/484-4355, $595. Database-reporting tool is one of the most effective end-user data-reporting tools yet evolved. It puts a considerable workload on the corporate information department; but it sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

Project Scheduler 5, Scitor Corp., 415/570-7700, $695. For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

TopDown 4.0, Kaeotron Software Corp., 713/298-1500, $345. Flowcharting program's support for custom symbols, multiple palettes, and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95. Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

Wings 1.1ae, Informix Software, 913/599-7100, $399. Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine.
**COMMUNICATIONS/NETWORKS**

- **AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95.** Utility translates most word-processor and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

- **CrossTalk for Macintosh 2.0, Digital Communications Associates, 404/442-6000, $195.** Commandable communications product has a feature set that will match its competitors. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

- **Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, $129. Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. Feb 94

- **Desktop Mooter Plus 4.0, Daysy Communications, 801/269-7200, $10.** File transfer and translation utility works with floppy, removable drives, and network volumes and supports wild cards in DOS extensions. Apr 94

- **EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995.** Priced at a fraction of the cost of dedicated hardware analyzes, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jan 94

- **MacLink Plus/Translators Pro 7.5, DataViz, 203/268-0030, $149.** If your PC files are in archaic formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

- **On The Air 1.0 (1.0.2), Digital Eclipse Software, 510/547-6101, $79.99 to $639.99.** Intercom system transmits System 7 SND resources, SoundEdit1, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

- **On The Road 1.1, Connectix, 415/571-5100, $495.** Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports hardware, however, so check before buying. Dec 93

- **Silver Cloud 1.2, AG Group, 510/937-7900, $495.** If you are administrating a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

- **SitComm 1.0, Aladdin Systems, 408/761-6200, $120.** Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

- **Snap Mail 1.01, Cassidy & Greene, 408/484-9238, $200 to $1440.** Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. Jun 94

- **SoftPC 3.1, Insignia Solutions, 415/694-7600, $499.** While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

- **Timbuktu Pro, Farallon Computing, 510/814-5000, $199 to $1999.** Terminal emulation product is a must-have for in-house technical support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

- **TrafficWatch II 2.0, Neon Software, 510/283-9771, $495.** The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. Without printing, alarms, triggers, or true multiprotocol support, this product misses the mark. Jun 94

- **VersaTerm 5.0, Synergy Software, 215/779-0522, $195.** The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to internet connectivity, this is it. Jan 94

**DESKTOP PUBLISHING**

- **AboutFace 1.1 (1.1.2), Big Rock Software, 716/288-2860, $69.95.** Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

- **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

- **Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895.** Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. This is a superb upgrade. Nov 93

- **Cumulus 1.1 (1.2), Canto Software, 415/431-6871, $295 to $895.** Good network support, plus a feature that creates a protocol file for recording user actions, makes this image-cataloging program a good choice for workgroups. It doesn't have an image-preview feature, nor does it offer 32-bit thumbnails. Aug 93

- **FontMonger 1.5.7, Ares Software Corp., 415/578-9095, $149.95.** Font-conversion utility provides cross-platform, cross-font conventions and makes it easy to create composite, subcast, superscript, and rotated characters. Sep 93

- **Fotocase 1.1, Agfa Division of Miles, 508/658-5600, $795.** Color-management software has a capable engine, but it's not the complete color management system Agfa touts. Invisible tech support and poor documentation were only part of the problem. Apr 94

- **FrameMaker 4.0, Frame Technology Corp., 408/483-3311, $895.** For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well-mannered, and a real time-saver. Mar 94

- **ImageAccess 1.0, Nikon, 516/547-4355, $495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

- **Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, $499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

- **Kudo Image Browser 1.0 (1.1), Impac Systems Corp., 619/272-6200, $195.** This image-cataloging software cannot control thumbnail depth or compression and doesn't have a keyboard feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. Aug 93

**EDUCATION**

- **Groler Multimedia Encyclopedia, Groler Electronic Publishing, 203/797-3530, $395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. Jul 94

- **How Computers Work, Time Warner Interactive Group, 818/955-5999, $79.95.** Graceful, well-integrated CD-ROM tutorial guides the casual stumblers through brief but helpful explanations of basic computer technologies. Jan 94

- **HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95.** Hypermedia authoring tool supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

- **Small Blue Planet 1.2, Now What Software, 415/885-3432, $79.95.** Nicely integrated collection of beautiful Earth-from-space images on CD-ROM lacks many features of standard atlases and doesn't have a search function, but is endlessly fascinating. Jul 94

**ENTERTAINMENT**

- **Blackjack Trainer, ConJelCo, 412/492-9210, $75.** Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

- **Crystal Crazy, Cassidy & Greene, 408/484-9228, $49.95.** Ultragosy, super-processed version of the classic Crystal Quest is challenging, and fun without being overly difficult. Each level retains some old elements and adds some new ones to keep you on your toes. Jun 94

- **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining
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Flavio Kampah heads KampahVisions, a broadcast design studio, directing and producing trend-setting, award-winning music videos and television graphics, including the U2 music video, "Even Better Than The Real Thing." Flavio became a VideoVision Studio® devotee while creating a new opening for the American Gladiator TV program and a series of promo spots for ESPN2 and Avirex Jeans.

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and informative game is for you. Oct 93

**** Falcon MC 1.0, Spectrum Holobyte, $10/52-1164, $69.95. Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

**** Firefall Arcade, Inline Software, 203/435-4955, $49.95. If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. Jun 94

**** Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $99.99. Take a diabolical New York cabbie with a penchant for time travel, toss in the Empire State Building, add a few brainteasers, and you've got this engaging game on CD-ROM. It's slow and the arcade scenes are hard to control, but overall it succeeds. Jan 94

Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, $59.95. In this game, professional archaeologist looking for Atlantis and leads it to the goals.. Mar 94

**** Seven Days in August, Time Warner Interactive Group, 818/955-9999, $59.99. Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, the building of the Berlin Wall to viewers in a way that truly, truly takes the period. Oct 93

**** SimCity 2000, Maxis Software, 510/254-9700, $69.95. In essence, your goal with this marvelous city-simulation software is to build a city and run it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. Jun 94

**** Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.95. The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

**** Spin Doctor, Callisto Corp., 508/655-0707, $59.95. In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. Jun 94

**** V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95. The post-D-Day conquest of Normandy is re-created in this game. Its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

FINANCE/ACCOUNTING

**** Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95. The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

**** BestBooks 1.0, Teleware, 201/586-2200, $99. In a straightforward uniminating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

**** ExpensePlus 1.0.1, State of the Art, 714/753-1222, $139.95 to $159.95. Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

**** Financial Competence 1.5, Competence Software, 603/435-5098, $59.95. Business economics tutorial explains how financial statements are compiled and how they relate to each other, but you could learn the same things from a book, faster and for less money. And that might be more financially competent thing to do. Jul 93

**** MacInTax 1993, ChipSoft, 602/295-3110, $69.95. Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. It's inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

**** MacInTax Tax Planner, ChipSoft, 602/295-3110, $15.95. Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

**** MacInTax Tax Savings Guide, ChipSoft, 602/295-3110, $19.95. Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

**** MacMoney 4.01, Survivor Software, 310/410-9527, $89.95. Personal-financial software has new and improved features that will please longtime users, but it hasn't caught up with the leaders in the field and won't win many new converts. Jul 94

**** Managing Your Money 6.0, Meca Software, 800/820-7457, $57.95. Personal-financial program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it's not as easy to use as the competition, it excels in tax, investment, and financial planning. Jun 94

**** Quicken 4, Intuit, 415/858-6095, $69.95. Personal-financial software is powerful and easy to learn. Even for a financial neophyte. Although slower than previous versions, it lives up to its promise of making financial choices easier and better organized. Nov 93

GRAPHICS

**** addDepth 1.0.2, Ray Dream, 415/960-0768, $179. The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

**** Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, $595. The Mac's most dependable draw program has added enough new features to bugle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition Nov 93

**** Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, $595. The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

**** Alias Sketch 1.5, Alias Research, 416/362-9181, $595. The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

**** Blueprint 4, Graphsoft, 410/290-5114, $295. Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. But not bothered by the price, this full-featured drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

**** BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $1399. If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

**** Collage 1.0.1, Specular International, 415/323-3100, $349. Image-compositing software is a flawed but serviceable tool that allows you to combine and composite multiple RGB images stored in PICT, TIFF, and Photoshop 2.5 formats. While it's functional and indisputably easy to use, its shortcomings, including slow screen redraw with no interrupt option, are nearly as numerous as its benefits. Jul 94

**** CoolUp 1.0, Pantone, 201/935-5500, $99.95. Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

**** DeBabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299. Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

**** DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, $895. The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

**** Expert Draw 1.0, Expert Software, 305/567-9990, $49.95. Inexpensive drawing program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginners illustrators. Optional, anyone on a budget. Aug 93

**** Foldi 1 Media Kit-Print Pro, D’Prix, 614/299-7192, $499.95. Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows, is free of artifacts, and is crisply focused. Aug 93

**** Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, $399. If you can put up with a few blemishes, this color paint software pro-
vides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

** Generic CADD 2.0, Autodesk, 206/487-2233, $495. Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

** Infini-D 2.5.1, Specular International, 413/253-3100, $695. Servicable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operating speed. Feb 94

** Kai's Power Tools 2.0a, HSC Software, 310/392-8441, $199. Phenomenally powerful suite of Photoshop plug-ins has an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. May 94

** MacroModel, MacroMedia, 415/252-2000, $1490. This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegant simple, making the Mac's inner resources a more pleasant place to work. May 94

** Ofoto 2.0 (2.02), Light Source Computer Images, 415/461-8000, $395. Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

** Paint Alchemy 1.0, Koos Tools, 415/487-7000, $595. For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little class into their work. May 94

** Pointillist, Pictor GraFX, 310/865-0495, $395. Stereogram software creates images that look, at first glance, like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's pleasantly wacky. Jul 94

** PosterWorks 3.0, S. H. Pierce & Co., 617/338-2222, $395. This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, graphic output roughly elegantly. Aug 93

** PowerDraw 4.0 (5.0), Engineered Software, 910/299-4843, $795. The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

** Ray Dream Designer 2.0.3, Ray Dream, 415/960-0768, $249. Although this 3-D illustration software remains a price leader, unstable operation, missing features, and sluggish performance are problems that need to be rectified. Jul 94

** Showplace 2.0, Pixar, 510/236-4000, $495 to 695. Adequate, entry-level, 3-D modeler is suitable for illustration and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. Apr 94

** StrataVision 3d 2.6.3, Strata, 801/628-5218, $595. 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

** StudioPro 1.0, Strata, 801/628-5218, $1495. If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this application is an excellent choice. Mar 94

** Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395. Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, it's conversions are not always flawless, but it can be a Macuser nonetheless. Nov 93

** Typrotect 2.0, Pixar, 510/236-4000, $295. An approachable interface, animation support, and outstanding Renderman rendering technology make this 3-D hyper-render a popular choice. This version improves on the original, but still lacks positioned positioning effects. Jun 94

** upFront 2.0, Alias Research, 416/362-9181, $299. Capable modeler is somewhat of an acquired taste. However, the time to learn it and you'll find useful, unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

** Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, $195. Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jul 93

** Wraptures One, Wraptures Two, Form and Function, 619/536-9999, $95 each. The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

** MATH/SCIENCE

** Alchemy II, Tripods Associates, 314/647-1099, $595. Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing clarity on a Mac IIci or better. Sep 93

** Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9786, $795. Space/image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (Pov/Visual III) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

** Caduceus Science Review Macintosh Project 1.0, Scientia, 677/776-3427, $150 to $250. If you're taking the ACMAT, you'd be nuts not to buy this interactive science review. With proper use, its 3MB of files are certain to improve your score. Apr 94

** CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $199.50. Much of the allure of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

** CSCI ChemOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $195 to $1595. Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $300,000 and required an equally costly minicomputer. It's a winner. Feb 94

** Geocom Pascaux Graphics, 602/299-0661, $115. The main problem this math-software attack is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

** InStat 2.01, GraphPad Software, 619/457-3909, $595. For scientists with limited statistics backgrounds, the chatty clarity of this lab-oriented statistics software's help screens will be invaluable, while the limited variables and minimal graphics won't be a problem. Nov 93

** LabView for Mac 3.0.1, National Instruments, 512/338-9119, $1995. For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard, in a class by itself. Jul 94

** Mathematica 2.2, Wolfram Research, 217/898-0700, $595. The one essential program in science and mathematics, this function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

** QC Tools 1.0, Abacus Concepts, 510/540-1949, $245. Quality-control tool kit for StatView appears to introduce a slight slowdown in program response, but is generally well designed, well documented, and suitable for quality-control neophytes as well as professionals. Jan 94

** Resampling Stats 1.0, Resampling Stats, Inc., 703/523-2713, $225. Innovative statistical software has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration. Jun 94

** SerePlot 2.12, Scientific Visions, 301/593-0317, $135. If you have piles of data and don't need animated, exploding bar-charts in 24-bit color, this scriptable plotting software should be part of your analysis tool kit. Jun 94

** Spyglass Dicer 2.0, Spyglass, 217/355-6000, $695. Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

** Spyglass Transform 3.0 (3.01), Spyglass, 217/355-6000, $595. Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

** StatView 4.0 (4.02), Abacus Concepts, 510/540-1949, $595. If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

** Sum Total 1.01, Concurrent Engineering Tools, 602/464-8208, $59.95. Exceptional calculator utility is packed with advanced features, including a mode that lets you sample and use the numerical color values in calculations. The convenient palette/approach causes a distinct time-lag in menu operations. Oct 93

** Turing's World 3.0, CSLI Publications, 312/658-1550, $19.95. Computer-science educational software lets you investigate some fundamentals in computing at an almost unbelievable bargain price. Feb 94

** Visualization of Natural Phenomena, Telos/Spinger Verlag, 408/249-9314, $59.95. CD-ROM introduction to applying all aspects of geometrical graphics to scientific imaging covers all disciplines and offers definitive analysis of methods. No other source covers this much material, at this level of clarity. Jan 94

** ORGANIZATION/PRODUCTIVITY

** Achieving Your Career 1.02 (1.04), Up Software, 415/921-4691, $695. HyperCard-based job-continues

MACWORLD August 1994 181
Talk about perception versus reality. Like something out of a science fiction movie, faxing came into being to move documents along at the speed of light. But in reality, "moving" hasn’t been the activity most associated with faxing. "Waiting" has. Waiting for the document to print. Waiting in line. Waiting for the fax to go through. A situation where things can get so bottlenecked, an entire office can be reduced to a crawl.

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search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★★★★★★★★ Arrange 1.1, Common Knowledge, 415/325-9900, $349. This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. May 94

★★★★★★★★★ CalendarMaker 4.0, CE Software, 515/224-1995, $59.95. Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★★★★★★★★★★★ ClionTrac 1.7.1 (1.7.2), Whiskey Hill Software, 415/851-8702, $135. Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★★★★★★★★★★★★★ Contact Ease 2.0.1 (2.0.2), WestWare, 619/274-5053, $395 to $1495. Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and automates assembly of activities. It has a few quirks but is overall a good program. Aug 93

★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★★
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but users should be aware that playback of QuickTime movies is often uneven. May 94

Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, $59.95. Sleek desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. Sep 93

ClipChange 2.0, Dubl-Click Software, 818/888-2068, $89.95. Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac’s look and feel. Aug 93

Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, $99. Although some of the 16 utilities offered in this package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It’s worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. Nov 93

CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, $59. This utility speeds up copying, lets you queue jobs for background copying, and offers a variety of other useful, copy-oriented features—all at a very reasonable price. Nov 93

Copyright Pro 1.0.3, CSG Technologies, 412/471-7170, $79. Takes over the Finder’s copying function, copies in the background, and allows you to regularly schedule copying. It doesn’t speed up copying, however. Nov 93

CPU 2.0 (2.0.1), Connectix Corp., 415/571-5100, $99. Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. Sep 93

CryptoMatic 1.0.1, Kent Marsh, 713/522-5625, $99. Security software offers fast Finder-level encryption and decryption with effective file removal. Although its simplest encryption algorithm isn’t quite hacker-proof, it’s not as if you’re dealing with another version of AutoDoubler, CopyDoubler, and a good file-management program, it’s worth the price. Jan 94

MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149. The quality of this utility collection is uneven—some modules are unpolished—but if you haven’t already own AutoDoubler, CopyDoubler, and a good file-management program, it’s very pretty paltry. Sep 93

MacTools 3.0, Central Point Software, 503/690-8090, $149. Recovering deleted files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. Mar 94

MagicTypist 2.0, Olduvai Corp., 305/670-1112, $129. If you want to speed up typing of repetitive phrases or if you don’t have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. Sep 93

Mr. File 2.0, Softways, 408/987-9167, $99. The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quirks. Dec 93

Now Compression 1.0 (1.0.1), Now Software, 503/274-2899, $69. Compression utility holds your data in a crowded market; it’s easy to use, it’s complete, and it compresses as well or better than other options. Dec 93

Now Fun, Now Software, 503/274-2899, $45. Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns and pictures are fairly limited, though. Dec 93

Now Utilities 4.0.1 (4.0.2), Now Software, 503/274-2899, $129. Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new, scrapbook feature, however, it awkward and inconvenient. Aug 93

Open Sesame 1.02, Charles River Analytics, 617/491-3474, $99. Utility automates Finder operations, such as opening and closing files, without resorting to macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don’t follow a routine. May 94

OptiMem 1.4.1, Jump Development Group, 412/681-2692, $129. Systemwide memory manager monitors RAM use and allocates RAM where it’s needed. Works best with software that handles minimum-memory situations effectively. Mar 94

Power To Go 2.0, Claris Corp., 408/727-8227, $49. PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It does lack features of similar products. Dec 93

QuickKeys 3.0, CE Software, 515/211-1801, $169. The simple, unintimidating interface of this macro-building utility allows you to build a set of useful shortcuts quickly. Mar 94

RAM Doubler 1.0.1, Connectix Corp., 415/571-5100, $99. Inexpensive system extension doubles available RAM for many Mac users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. May 94

Redux Deluxe 2.0.2 (2.5), Inline Software, 203/435-4995, $79.95. Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn’t have a compression option. Jan 94

Reskop 2.0, Dantz Development Corp., 510/253-3000, $249. Powerful backup and archiving software has an improved interface and scripting capabilities—and works well for all levels of users. Sep 93

Retrospect Remote 2.0, Dantz Development Corp., 510/253-3000, $449. Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer’s tests. Sep 93

SafeDeposit 1.2, Dayna Communications, 801/269-7200, $189. Automated backup program is easy to set up but slow. Also, unintended backups must be restored from scratch if disk space runs short and a new drive isn’t available. May 94

Safe or Sorry 1.0, Olduvai Corp., 305/670-1112, $59. Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

SAM 3.5.8, Symantec Corp., 408/253-9600, $99. Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

Screenscapes 1.0.1, Kiwi Software, 805/685-4031, $44.95. With more than 600 desktop patterns—and a taste of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93

Square One 1.5.2, Binary Software, 310/582-8293, $574. Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93

Stacker for the Macintosh 1.0, Stac, the Data Compression Company, 619/431-7474, $149. As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

Star Wars Visual Clips, Sound Source Unlimited, 805/454-9996, $89.95. Control panel lets you play QuickTime movie clips from Star Wars at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will...
Star Ratings

make you remember why you love your Mac. Sep 93

***** Tempo II Plus 3.0.3, Affinity Micro­
systems, 303/442-4840, $179.95. Very capable
macro-creating utility may be daunting for novices but of­
fers plenty of power for advanced users. Mar 94

***** TimesTwo 2.0, Golden Triangle Com­
puters, 619/587-0110, $149. This driver-level
compression utility is transparent and robust. It caused no
problems during a two-month course of testing, on a sys­
tem with myriad utilities and system software tools. Mar 94

***** Toner Tuner 1.0.3, Working Software,
408/423-5696, $24.95. Inexpensive, incredibly use­
f ul version adds a sliding bar to print dialog boxes allowing you
to adjust the amount of toner applied to each print job.
If you can't save trees, you can at least save toner. Dec 93

***** ultraShield 1.252 (1.3) users Software,
714/756-5140, $149. Sophisticated security
product combines practically every feature you might need
into an integrated package, including a lightning-fast ver­
sion of the U.S. government data-encryption standard. Sep 93

**** * * Toner Tuner 1.0.3, Woriking Software,
415/856-3333, $199.95. Correctly placing objects is un­
duly cumbersome in our reviewer's System Folder. Jan 94

**** Virtual Disk 1.1, Continuum Soft­
ware, 206/695-8136, $59. Rapid disk cataloging: fast,
efficient label-printing; and an excellent disk-copy utility
make this software package a wonderful value. Jul 94

**** VirtualDisk 1.1a, Continuum Soft­
ware, 206/695-8136, $59. Rapid disk cataloging; fast, efficient
label-printing; and an excellent disk-copy utility
make this software package a wonderful value. Jul 94

**** Working Watermarker 1.02, Working
Software, 408/423-5696, $49.95. Simple, useful
system extension allows you to print or fax text and/or graphs
"watermarks" in the background of virtually any document.
Although it has imperfections, it's earned a per­
manent spot in our reviewer's System Folder. Jan 94

VERTICAL MARKETS

***** Claire, The Personal Music Coach 1.0.1,
Opcode Systems, 415/856-3333, $129.95. Musicianship program teaches pitch and inter­
val recognition, sight singing, and intonation. Although the
interface is nonstandard, it's logical and easy to learn. May 94

**** Finale 3.0.1, Coda Music Technol­
yogy, 800/842-2066, $749. Upgraded music notation
software is now infinitely more pleasant to use. Its com­
prehensive feature set makes it the standard against which all
other music notation products must be judged. Dec 93

**** MacInteriors, Microspot, 408/253-2000,
$129. Correctly placing objects is unduly cumbersome in
this interior-design software, but once you catch on to the
program's quirks, it's useful. Feb 94

**** Musicshop 1.0, Opcode Systems,
415/856-3333, $149.95. MIDI sequencer is an ex­
cellent choice as a first sequencer. It's powerful enough to satisfy
the needs of most MIDI users. Oct 93

**** Roll Call 2.0, (2.5 or 3.0), by the Num­
bars, 603/927-4508, $495 to $595. 4th Dimen­
sion database application for church management helps track
donations, attendance, church-group membership, and visit­
ations. While not a complete church-management system,
its an acceptable complement to a general accounting
program. Aug 93

**** Sailing Master 1.1, Starboard Software,
313/662-4393, $64.99. Though the slow speed and
jerky motion point to less-than-polished programming, this
sailboat-racing simulation offers good tactical play and is
fun—well worth the price for sailing competitors. Nov 93

**** WillMaker 5.0, Nolo Press, 510/549­
1976, $59.95. Legal software quickly and easily
automates the creation of wills, health-care directives
and proxies, and final-arrangements documents. It offers excel­
Downloaded from https://macworld.com/library/fullview.php?file=199405-0029 at 2020-02-10 01:34:47
This is the property of Apple Computer, Inc. and/or its suppliers and is protected by copyright law. Unauthorized copying or disseminating is illegal.
Computer, 408/996-1010, $599. Although Apple released this personal digital assistant too early and marketed hype led to mistaken expectations, this is a very intelligent piece of work with an impressive variety of serious business uses. Dec 94

★★★★ Apple PowerCD, Apple Computer, 408/ 996-1010, $400. This extremely versatile and beautifully designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you’re a serious CD-ROM user, it’s too slow to satisfy. Jan 94

★★★★ Ear Phone Streamline AV, Jabra Corp., 619/622-0764, $169. As a hands-free telephone and as a replacement for the Apple PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Its biggest drawback is that you can’t hear other Mac sounds, such as modem tones, when it’s plugged in. Jul 94

★★★★ EMBARC, Embarc Communications Services, 407/364-2000, $395 plus fees. If you’re a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. Sep 93

★★★★ G-Vox, Lyrrus, 215/922-0880, $399. Hardware-software garment-instruction package lets your Mac “hear” the notes you play on your guitar. Although the hardware works well, the software has some basic problems and doesn’t live up to the hardware. Apr 94

★★ Hello Music, Yamaha Corp. of America, 714/522-9240, $449. MIDI starter kit includes an impressive tone generator that’s compatible with General MIDI Level 1 and Roland MT-32, but the included software is functional at best. Dec 93

★★ Macintosh TV, Apple Computer, 408/996-1010, $2079. As a computer, this combination computer-television-CD player is sleek but slow. You can get faster performance and better expandability from several less-expensive Performa models. Apr 94

★★★★ PowerLink Presenter, E-Machines, 503/ 646-6699, $499. Simple, compact Duo Dock wobbles a bit when plugged in but provides line support for a variety of displays, plus ports for ADB, floppy drive, and sound output. Nov 93

★★★★ PowerPlate, Technogjinn, 513/321- 1777, $169.95 to $299.95. Line of long-lived, external PowerBook battery packs, each of which enables you to work more than one; they’re more cost-effective than a 20-ppm printer. Apr 94

★★★★ RCD-202, Pinnacle Micro, 714/727- 3300, $3995. Writable CD-ROM drive is good for archiving data simply and inexpensively, but it’s incompatible with many hard drives. Mar 94

★★★★ ThinPack, VST Power Systems, 508/ 287-4600, $159.95. External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. Mar 94

★★★★ TurboDialer, Advanced Software, 408/783-0745, $79.95. Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. If you constantly dial phone numbers that are stored in your computer, this product will save you time and energy. Jul 94

★★★ Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9240, $149.95. Powered speakers have a good balanced sound and a great volume range at an outstanding price. Apr 94

MODEMS/NETWORK HARDWARE

★★★ AsantéHub 1012, Asanté Technologies, 408/435-8368, $1299. This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. Dec 93

★★★ Cypress PhonePro 1.2, Cypress Research Corp., 408/752-2700, $349 to $950. By improving its integration with FaxPro and with PowerTalk and Powershare, this powerful telephone software has greatly extended its business scope. May 94

★★★ DataLink PB, Accell Cellular Interface, Applied Engineering, 214/241-6060, $824. If you need a full-fledged office on the beach, this PowerBook cellular modem-package with automatic answering machine is a well-executed solution. Each recorded second requires 25k of disk space. Nov 93

★★ EtherWave, Farallon Computing, 510/814-5000, $129. If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. May 94

★★★ PerFit Port-A-Com, PerFit, 303/530- 7333, $349. Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but is still a solid product at a reasonable price. Nov 93

★★★ SupraFaxModem 144PB, Supra Corp., 503/967-2400, $349.95. If you’re looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disadvantages include not supporting multiple protocols and the higher price may be worth it. Jul 94

★★★ Watermark Message Central 2.0, High Technology, 415/688-9600, $699. Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a well-executed solution. Each recorded second requires 25k of disk space. Nov 93

Address Express, CoStar Corp., 203/661- 8000, $800. With 3MB of RAM, PostScript printer with both Mac and DOS ports. Apr 94

★★★★ Apple Color Printer, Apple Computer, 408/996-1010, $239. If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn’t support PostScript. Aug 93

★★ Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439. Sleek, portable ink-jet printer weighs 4 1/2 pounds and is a pleasure to use. It has standard StyleWriter cartridges. Jan 94

★★ Brother HI-400, Brother International, 800/586-8800, $369. Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. Some large files require additional application memory to print correctly. May 94

DeskWriter 310, Hewlett-Packard, 800/752-0900, $379 to $455. Versatile, low-cost ink-jet printer is a 4.3-pound, battery-powered portable. With its 60-page sheet feeder, it’s also a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. Mar 94

★★ HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279. Primarily for those of you who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. May 94

★★★ LaserWriter Select 300, Apple Computer, 408/996-1010, $839. Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGarde capabilities, which allow the printer to generate 91 shades of gray. Aug 93

★★ LaserWriter Select 310, Apple Computer, 408/996-1010, $1099. This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it’s not networkable or compatible with the Communications Toolbox. It can’t automatically switch ports, and it doesn’t have adjustable paper guides. Aug 93

★★★ LaserWriter Select 360, Apple Computer, 408/996-1010, $1599. Low-cost, high-performance, 10 ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they’re more cost-effective than a 20-ppm printer. Apr 94

★★★★ microLaserPro 600, Texas Instruments, 800/846-3927, $2148. Overall, this workgroup printer is fast and provides good print quality. The price is cheaper than that of other products, but if you work in a busy office where a really fast printer makes everybody’s life easier, the higher price may be worth it. Jul 94

★★★ MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, $999. Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy paper, it’s mediocre on inexpensive bond. Dec 93

★★★ Notebook Printer II, Citizen America, 310/ 453-6014, $399. If weight and size are your biggest concerns in choosing a portable printer, and you print primarily in black and white, this thermal-fax printer may be a good choice. If speed is at all an issue, however, other options may be preferable. Jun 94

★★★ Personal LaserWriter 320, Apple Computer, 408/996-1010, $959. If you’ve been holding out for a high-quality personal laser printer that’s fast enough to share over LocalTalk, the small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. May 94

★★★ Phaser 2001 Color Printer, Tektronix, 503/682-7377, $9595. This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopy paper. Aug 93

★★ PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, $2450. While this multimedia printer is fast and prints clearly, many Mac users will find it frustrating if it can’t print some TrueType fonts. Jul 93

★★★ OMS ColorScript Laser 1000, OMS, 208/ 633-4300, $9599. Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don’t need to chase rainbows right away, you might wait and see if competition drives prices down and capabilities up. Jul 94

★★ Silentwriter 640, NEC Technologies, 508/264-8000, $800. With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, this printer is a capable performer. Generally, it represents hassle-free printing, but it doesn’t handle single sheets of paper well. Jun 94

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**SCANNERS**

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<td>Smart Label Printer Pro, Selko Instruments</td>
<td>408/922-5900, $299.95</td>
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<td>You need to print only a few labels at a time; this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. May 94</td>
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<tr>
<td>Apple Color OneScanner, Apple Computer, 408/996-1010, $1349.</td>
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<td>Tests of this color scanner demonstrate unpolished colors and sharp image details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. Jul 93</td>
</tr>
<tr>
<td>Coolscan LS-10e, Nikon Electronic Imaging, 516/547-4200, $2600.</td>
<td>Compact desktop scanner for digitizing images from 35mm transparencies is slow, but delivers images good enough for newspaper publications and some catalogs. Dec 93</td>
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<tr>
<td>Epson E5-800C, Epson America, 310/782-0770, $1499; Macintosh interface kit $399.</td>
<td>Flexible 4-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package. Aug 93</td>
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<tr>
<td>IX-4015 Color Image Scanner, Canon Computer Systems, 714/438-3000, $1169.</td>
<td>Price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office, if you can get by without legal-size scans, it should serve you well. Jul 94</td>
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<tr>
<td>LightningScan Portable, Thunderware, 510/254-6591, $459.</td>
<td>PowerBook owners will find this hand scanner's modern-serial-port connection, lightweight interface, and total portability well worth the cost, although the scanner is incompatible with some desktop Macs. Dec 93</td>
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<tr>
<td>Mirror 800 Plus Color Scanner, Mirror Technologies, 612/633-4450, $1299.</td>
<td>Add the NuBus JPEG board ($309) and easy-to-use 35mm transparency scanning module ($599), and you get a stilly slow—desktop scanning package for a reasonable price. Jan 94</td>
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<tr>
<td>ScanMaker 500 Color 6000 for Mac, PlusTek USA, 408/980-1284, $749.</td>
<td>Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. Sep 93</td>
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<tr>
<td>PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $3169.</td>
<td>The active matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedily processor provides a pleasant work environment. Jul 93</td>
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<tr>
<td>PowerBook 160c, Apple Computer, 408/996-1010, 4/80 $3999.</td>
<td>By choosing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. Dec 93</td>
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<tr>
<td>PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3099.</td>
<td>Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. Feb 94</td>
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<tr>
<td>PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/80 $3169.</td>
<td>The active matrix screen of this color notebook computer is beautiful, but small that its usefulness is very limited. Sep 93</td>
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<tr>
<td>PowerBook 160c, Apple Computer, 408/996-1010, 4/80 $3169.</td>
<td>This accelerator card has the fastest 6B040 architecture on monitor s up to 17 inches and resolutions as high as 1024 x 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. Oct 93</td>
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**BUYERS' TOOLS**

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<td>SCSI MicroDock, Newer Technology, 316/685-4804, $175.</td>
<td>Tiny double docking station is just under 4&quot; in size and barely 6 inches long. It adds only an ADB port and a SCSI port—but both are useful. May 94</td>
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<tr>
<td>SledgeHammer2000FMM, F4B, 415/474-8055, $3179.</td>
<td>RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. Apr 94</td>
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<tr>
<td>SmartStack, Envisio, 612/628-6288, SmartSource $119; SmartModules $289 to $3179.</td>
<td>The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. Sep 93</td>
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<tr>
<td>Turbo 040, DayStar Digital, 404/976-2077, $1899.</td>
<td>The accelerator card has the fastest 6B040 chip available and is as fast as or faster than any Mac in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. Dec 93</td>
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**VIDEO/DISPLAY**

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<tbody>
<tr>
<td>Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, $749.</td>
<td>If you're in the market for a medium-quality, digital color camera that costs less than $1000, this is the best deal around. Even if you're not in a hurry, you may want to wait until some of the camera's more obvious problems, such as its fixed-focus lens and lack of a zoom option, are ironed out. Jul 94</td>
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<tr>
<td>AudioVision 14 Display, Apple Computer, 408/996-1010, $769.</td>
<td>Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. Dec 93</td>
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<tr>
<td>Dycam Model 3, Dycam, 818/998-8008, $895.</td>
<td>Low-end, digital still camera is easy to use, and is a solid product if instantaneous gray-scale mode meets your image-quality requirements. Sep 93</td>
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<tr>
<td>Dymo Labelwriter 300, ITX, 718/977-8046, $199.</td>
<td>Type bar printer is easy to use, and is a solid product if it meets your needs. Sep 93</td>
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<tr>
<td>Moviestudio, Sigma Designs, 510/790-1010, $3149.</td>
<td>This 7-inch NuBus video capture board may be what you've been waiting for. It is price-right, and the addition of on-board audio input is a plus, if it is only a video board. Dec 93</td>
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<tr>
<td>PaintBoard Turbo, RasterOps, 408/562-4200, $1499.</td>
<td>Digital video board supports 24-bit color on monitors up to 17&quot; in size and resolutions as high as 1024 x 768 pixels. Jul 94</td>
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<tr>
<td>QA-350 LCD, Sharp Electronics Corp., 800/237-4277, $2495.</td>
<td>At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative for presenters who don't need multimedia capability. Jul 94</td>
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<tr>
<td>VideoToolKit 2.0, Adobe Video, 508/376-3712, $279.</td>
<td>Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotape on a budget. Sep 93</td>
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Selected and edited by Charles Barrett
The following listings include both time-sensitive promotions and long-term offers being sponsored by Macintosh vendors and their resellers. Each listing indicates products that have been awarded a star rating in Macworld's Reviews (products rated ★★ or lower are not eligible for inclusion), have been selected as an Editors' Choice, or have won a World-Class award. In some cases, the editorial evaluation quoted is for an earlier product version. The ♦ symbol indicates that the product is Power Mac related.

When placing an order, please mention that you saw the offer in Macworld. Should any problems arise, contact the Streetwise Shopper editor by fax (415/442-0766), phone (415/978-3241), or mail (Macworld, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the Streetwise Shopper editor with particulars.

**BUNDLES**

**FlexScan Monitors + Colorific**
Nanoo USA will begin shipping Sonnetech's Colorific software-only color-management system, once it becomes available in August. All FlexScan monitot (Jan 94 "Small Wonders" Editors' Choice) for FlexScan F380W+0 customers who return their warranty registration cards. The Colorific versions desired for Nanoo customers will all list FlexScan models on a menu, along with a standard VGA setting for non-Nanoo monitors. Call 800/898-5202 for more information.

**Last Resort + Toner Tuner 1.0.6 + Working Watermarkner 1.0.6**
Working Software is offering a bundle of 3 of the 16 best utility programs (Apr 94 "Top Utilities"): its $19.95 Last Resort for storing keystrokes in text files; its $21.95 Toner Tuner for adjusting how much toner should be applied to each print job (Dec 93 ★★★★ for version 1.03); and its $19.95 Working Watermarker for printing or faxing text or graphics watermarks in the background of a page (Jan 94 ★★★★ for version 1.02). Available direct (800/229-9675) for $89.95.

**MoviePak2 Pro Suite**
RasterOps has combined several third-party products with its $180 MoviePak2 compression-daughterboard, $249 24XLT video display adapter, and $649 Video Expander II RGB/NTSC encoder box to create a $4199 full-motion, 60-freeld VideoTime video-production system (Jan 94 "Video-Editing Tools" Editors' Choice). Adobe's $695 Premiere 3.0 QuickTime video-editing software (Jan 94 ★★★★); Adobe's $695 Premiere 3.0 QuickTime video-editing software (Jan 94 ★★★★); Alias's $89.95 DisExpire II disk-optimizer utility; and a special RS-422 Pro-96 Pro version of Abbate Video's $99 VTK Plug-In for fast professional VTR control. Call 800/729-2656 for more information.

**PowerBook 500 and Duo 200 Series + 12 Utilities + PowerPort/Mercury**
Apple has integrated software into its 68040-based PowerBooks starting at $2269 and Duo's starting at $2639 (Jul 94 "PowerBooks: The Next Generation")—including Apple Remote Access Client 2.0 for server connection, Macintosh PC Exchange 1.02 to read and write DOS/Windows floppy disks, PowerBook File Assistant synchronization package, PowerBook Control Strip 1.0 power-management utility, PowerTalk electronic-mail-management extension for Macintosh (with models for 12MB of RAM), and DataViz's MacLinkPlus Easy Open Translators for converting among Mac and DOS/Windows file formats. In addition, the 500 series comes with Global Village's 14-4000-bps PowerPort/Mercury internal fax modem and GlobalFax application, plus 12time data communications software.

**SuperPaint 3.5 + HomePublisher 2.0**
Aldus is bundling these two products in a Paint & Publish one-box collection with an "estimated street price" of $89.99. SuperPaint includes pressure-sensitive drawing tools, TWAIN support, and a Quick-Time plug-in module. HomePublisher (formerly Personal Press) is an entry-level-page-layout program that includes document templates, T/Maker ClickIt images, 12 Bitstream TrueType fonts, and specialty paper. Call 800/880-6293 for more information.

**Thunder 7 1.5.3 + Magnet 1.0 + CPU 2.0.1 + Full Contact 2.01**
Baseline Publishing is bundling its $99.95 Thunder 7 spelling checker and thesaurus (Nov 93 ★★★★★) with No Hands Software's $129.95 Magnet intelligent-agent-based utility for automating file management (Feb 93 ★★★★★). Connectix Corporation's $99 CPU PowerBook utility (Sep 93 ★★★★★ for version 2.0), and Fit Software's $169 Full Contact personal information manager (Aug 94 ★★★★). Available through MacWarehouse (800/255-6227) for $79.95. Offer expires 8/31/94.

**SIDEGRADUES/UPGRADES**

**CalendarMaker**
CE Software is offering users of this calendar-making program (Oct 93 ★★★★★ for version 4.0) a choice of upgrading to version 4.1 for $25, or to version 3.0 for $10. The 4.1 upgrade features over 50 layout styles, recurring-events editors, two formatting palettes, and six paint tools for color icon editing. The upgrade to 3.0 is available to those who are current with their current version's functionality, but require System 7 compatibility. Call 800/523-7638 for more information. Offer expires 8/31/94.

**Mathematica 2.2**
Wolfram Research is offering the $995 Enhanced Version (requires math coprocessor) of this symbolic mathematical computation system (Sep 93 ★★★★★) for the Standard Version to users of any other technical software program, for $995. Call 800/441-6284 for more information and to order. Offer expires 7/15/94.

**PowerMerge 2.0**
Leader Technologies is offering this file-synchronization program (Aug 94 ★★★★★) for $49 regularly sells for $75) to users of competing synchronization and backup programs or PowerBook utility programs. Call 800/902-1787 to order. Offer expires 9/30/94.

**SPECIAL DISCOUNTS/REBATES/OFFERS**

**Clarisimpact**
Clara Corporation is offering a special $149 introductory price for the native Power Mac version of this $399 integrated business-graphics program (Jun 94 ★★★★★ for the 68000 1.0 version). In addition, users of calendar-making, flowcharting, project-scheduling, data-charting, and organizational-charting programs can trade up to Clarisimpact (both the 68000 and Power Mac versions are included) for $99. Call 800/541-8954 for more information. Offer expires 9/30/94.

**Claris Organizer**
Clara Corporation is offering a special $49 introductory price for this soon-to-be-released (early August) $99 integrated personal information manager that allows you to access contact-management, calendar, to-do, and notes capabilities from a single floating palette. Call 800/326-2747 for more information. Offer expires 9/30/94.

**Expert Pad Newton 1.3 Operating System**
Sharp Electronics is offering version 1.3 of the Newton OS (version 1.05 can be downloaded from America Online or CompuServe with a Newton Connection Kit) to Expert Pad users for $49 (Apple charges $99, which includes two Newton applications). Besides increasing performance and fixing bugs, version 1.3 adds enhanced letter-by-letter and deferred handwriting recognition. Call 800/237-4277 for more information. Offer expires 8/15/94.

**Power Macintosh Computers**
Apple Commercial Credit, a partnership between Apple and Dana Commercial Credit, is offering rebates on every Macintosh it leases, according to the following schedule: $100 for the model 6100/60 (Jun 94 ★★★★★) or 60AV; $200 for the 7100/66 (Aug 94 ★★★★★) or 66AV; and $300 for the 8100/80 (Aug 94 ★★★★★) or 80AV. Customers who already have upgradeable equipment on an Apple Business Lease can add a Power Macintosh upgrade to their current lease. Call 800/225-0513 for leasing program details. Offer expires 9/30/94.

**TelePort and PowerPort**
Global Village is offering purchasers of its $349 TelePort Mercury, $279 TelePort Gold (Oct 93 "High-Speed Fax Modems" Editors' Choice), $399 PowerPort/Mercury, and $349 PowerPort/Gold (Dec 92 ★★★★★) 14400-bps and 9600-bps fax modems a $100 rebate coupon toward the purchase of its $999 ($1199 for one-line LocalTalk; $1899 for two-line Ethernet) OneWorld Remote Access fax server (Aug 94 ★★★★★). Call 800/736-4821 for more information. Offer expires 9/30/94.

**VideoVision Studio**
Radix is offering a $200 trade-in rebate toward the purchase of this $4995 video-production system (Jun 94 "Video-Editing Tools" Editors' Choice), which comes bundled with Adobe Premiere (Jan 94 ★★★★★ for version 3.0) and VideoFusion (Jul 93 ★★★★★ for version 1.0.1)—to owners who trade in a New Video, RasterOps, Sigma Designs, or SuperMac video-capture board. Call 800/966-7360 for more information. Offer expires 8/5/94.
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Please answer these questions so that we may better serve you.

<table>
<thead>
<tr>
<th>A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-99</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Which of the following computer models is/are installed at this entire work-site? (Check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Workgroup-Servers/ Mac Quadra series</td>
</tr>
<tr>
<td>Mac Centris-II series/ LC III/ Performa 600/ 6100/ 30</td>
</tr>
<tr>
<td>Mac LC/ IIP/ Performa 430/ 430/ 90/ 70/ 70/ 600/ 6100/ Portable</td>
</tr>
<tr>
<td>Mac PowerBook series/iia series</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. What is the total number of Macs installed at this entire work-site? (Check one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. How many Macintosh computers within this entire work-site do you have purchase authorization for products and/or services? (Check one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. In which ways are you ever involved in purchase decisions for Macintosh products at this work-site? (Check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curtail/Determine need for product/ capabilities/features</td>
</tr>
<tr>
<td>Evaluate, recommend, or approve brands/models</td>
</tr>
<tr>
<td>Evaluate, recommend, or purchase from vendor</td>
</tr>
<tr>
<td>Authorize purchases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F. Over the next 12 months, how much will you spend on Macintosh products and/or services? (Check one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1 million or more</td>
</tr>
<tr>
<td>$500,000 - $999,999</td>
</tr>
<tr>
<td>$250,000 - $499,999</td>
</tr>
<tr>
<td>$75,000 - $249,999</td>
</tr>
<tr>
<td>Under $75,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business software (Word processing, spreadsheet, database, etc.)</td>
</tr>
<tr>
<td>Graphics publishing software</td>
</tr>
<tr>
<td>Workstations/ displays</td>
</tr>
<tr>
<td>Peripherals/scanners</td>
</tr>
<tr>
<td>Networking/communications hardware and/or software</td>
</tr>
<tr>
<td>Multimedia/hardware and/or software</td>
</tr>
<tr>
<td>Mobile computer products (PowerBooks, peripherals, software, etc.)</td>
</tr>
</tbody>
</table>

H. What is your primary job function? (Check one) |
- Computer Reseller/ VAR/ VAD |
- MIN/ ISP/ Network Management |
- Engineering |
- R&D/Scientific |
- Corporate/General Management |
- Accounting/Finance |
- Marketing/Sales/ PR |
- Communications |
- Art/Design/ Creative Services |

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<thead>
<tr>
<th>DESKTOPS</th>
<th>1-yr Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Macintosh</td>
<td></td>
</tr>
<tr>
<td>Macintosh Quadra</td>
<td></td>
</tr>
<tr>
<td>Macintosh Classic</td>
<td></td>
</tr>
<tr>
<td>Printers &amp; Monitors</td>
<td></td>
</tr>
<tr>
<td>$100 to $1,000</td>
<td>$39</td>
</tr>
<tr>
<td>$1,001 to $2,000</td>
<td>$40</td>
</tr>
<tr>
<td>$2,001 to $3,000</td>
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</tr>
<tr>
<td>$3,001 to $4,000</td>
<td>$80</td>
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<tr>
<td>$4,001 to $5,000</td>
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</table>

<table>
<thead>
<tr>
<th>POWERBOOKS</th>
<th>1-yr Premium</th>
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<tbody>
<tr>
<td>Apple Macintosh PowerBooks</td>
<td></td>
</tr>
<tr>
<td>$100 to $1,000</td>
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<table>
<thead>
<tr>
<th>NEWTON</th>
<th>1-yr Premium</th>
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</thead>
<tbody>
<tr>
<td>Apple Newton</td>
<td>$52</td>
</tr>
</tbody>
</table>

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PowerBook 140 4/40 ... 999

All other CPUs ... CALL

Apple 40MB 3.5 Internal HD ... 49

Apple 5.25 External PC Drive ... 49

PowerBook 20/40/440/899

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HP PalntWrlter Xl ... 599

PowerBook 20/40 8/80 ... 899

PowerBook 140 4/40 ... 999

All other CPUs ... CALL
LPS & PRODRIVE SERIES

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Access Time</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>85mb</td>
<td>13ms</td>
<td>$135</td>
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<tr>
<td>170mb</td>
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GO-DRIVE SERIES

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<td>88c</td>
<td>17ms</td>
<td>$339</td>
<td>$459</td>
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</table>

Removable Hard Drives

**SyQuest REMOVABLE TECHNOLOGY**

All SyQuest drives include a TWO Year Warranty. All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation.

**CD-ROMs**

MultiSpin 3Xp

The 3Xp combines 3X transfer rate performance, 250ms access time and a 250 KB continuous flow cache in a compact design, making it and incredible value. At only 2.4 lbs, the 3Xp is the world’s lightest triple speed CD-ROM reader.

NEC CD-ROM READERS

MultiSpin 3Xk (External 2X, 195ms access time) ................. $469 .... $569
MultiSpin 3Xk (Internal 2X, 195ms access time) ................. $439 .... $539
MultiSpin 3Xk (Portable 2X, 200ms access time) ................. $399 .... $499
MultiSpin 4X Pro (External 180ms access time) ................. $935 .... $1035

**ClubMac Removable Tape Backup**

**ClubMac Tape Backup**

**ClubMac 2X Speed CD-ROM Reader**

**NEW!**

**CLUBMAC CD-ROM BUNDLE**

**CLUBMAC CD-ROM BUNDLE**

$800 VALUE

- MultiSpin 3Xp
- ClubMac 2X Speed CD-ROM Reader
- ClubMac 3Xe Removable Drive
- SyQuest Removable Technology
- Quantum New 3.5" 230MB Fujitsu Optical

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drive carry a ONE Year Warranty.

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### CLUBMAC 20" TRINITRON MONITOR BLOWOUT

**Monitors & Graphic Cards**

#### GRAPHIC CARDS

<table>
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<tr>
<th>Model</th>
<th>Price</th>
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<tr>
<td>LeMans GT (0447)</td>
<td>$1499</td>
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<tr>
<td>PrecisionColor Pro 24X (0329)</td>
<td>$1349</td>
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<td>PrecisionColor Pro 24XX (0430)</td>
<td>$699</td>
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<td>PrecisionColor Pro 24XP (0431)</td>
<td>$449</td>
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<tr>
<td>PrecisionColor Pro 24 (0421)</td>
<td>$824</td>
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#### MULTIMEDIA

**VideoStudio (0418)**

- $3389
- $4361

- **VideoStudio Basic (0416)**
  - $1549

**Intellicolor Display 20**

- $1349
- $1499

**TPD20gs I0 436J / 2lgs (0437)**

- $5799
- $5989

**40 MHz Turbo w/ 128 K color**

- $1959

**Mini EN/SCI 01 11S 11G1 1JJ.11D 1rn ..-.**

- $1297

**Mini EN/SCI 01 11S 11G1 1JJ.11D 1rn ..-.**

- $1297

**17" MultiSync SFGp**

- $400 rebate, MFR '10 0.00 rebate, MFR '75.00 rebate

- $1729

**IntelliColor Display / 20**

- $1349
- $1499

**PrecisionColor Pro 24X**

- $1349
- $1499

**TURBO 040 ACCELERATORS**

- $1165

**GRAPHIC CARDS**

- $5187

**FastCache Turbo-1000 M1**

- NO REBATE

**FastCache PowerPro-1 MB Cache I0:xi m1...**

- $499

**PrecisionColor 24X 10 4211**

- $824

**PrecisionColor Pro 24XK 104 301**

- $699

**TURBO 040 ACCELERATORS**

- $1165

**GRAPHIC CARDS**

- $5187

**FastCache Turbo-1000 M1**

- NO REBATE

**FastCache PowerPro-1 MB Cache I0:xi m1...**

- $499

**PrecisionColor 24X 10 4211**

- $824

**PrecisionColor Pro 24XK 104 301**

- $699

### Input Devices

**UD Series Graphic Tablets**

- **Artz 6x8 A00 Tablet**
  - $99

- **J2 12x12 Standard Tablet**
  - $1029

- **J2 12x18 Electrotastic Tablet**
  - $939

- **J2 16x25 Standard Tablet**
  - $2579

**Scanners**

**EPSON**

- **ES-800C Pro Mac**
  - $1199

**MICROTEK**

- **ScansMaker II G with Internal 2Gb and FujiFilm 1200dpi**
  - $489

- **ScansMaker ISP with Printing 2510**
  - $799

- **ScansMaker Iff with Printing 2.5**
  - $1089

**GLOBAL VILLAGE**

- **SUPRAFOX Modem 14.4 LC**
  - $159

- **SUPRAFOX Modem 14.4**
  - $225

**ClubMac**

- **1-800-258-2622**
  - Tech Support: (714) 688-6888

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**Circle 96 on reader service card**

MACWORLD August 1994 201
An APS Breakthrough...

**APS HARD DRIVES**
For your Mac or Power Mac

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Internal</th>
<th>SR2000</th>
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<tr>
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<td>APS MX 270</td>
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**POWERBOOK DRIVES**

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<tr>
<td>APS PB 85</td>
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<td>APS PB 170</td>
<td>160MB</td>
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<td>APS T 213</td>
<td>202MB</td>
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<td>APS PB 250</td>
<td>240MB</td>
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<td>APS T 340</td>
<td>324MB</td>
<td>$49</td>
<td>69</td>
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**PORTABLE STORAGE**

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</thead>
<tbody>
<tr>
<td>APS ST 2000</td>
<td>520MB</td>
<td>$799</td>
<td>4 Hour Battery!</td>
</tr>
</tbody>
</table>

---

**SCSI Sentry**

Now you can "stop SCSI Voodoo" on your SCSI Chain, even when you're not ready to buy a new drive. Our new SCSI Sentry gives you all the benefits of APS' acclaimed DATerm technology in the form of an external SCSI performance monitoring instrument.

**Benefits**
- Optimizes Overall SCSI Performance
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- Validates SCSI LVD Voltage
- Certifies Bus Impedance Issues
- LEDs Compact Monitoring Tool
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If you need high-speed backup (not the kind that ties your server up and slows down your network), you need the DDS-2 power of the APS HyperDAT. Back up locally at rates as high as 20MB per minute! Pack up to 10GB on a single tape! Best of all, your regular DDS and DDS compression tapes can be read in the APS HyperDAT, too!

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All APS DATs include Retrospect, a SAVVY Value, Free!

---

### DAT

<table>
<thead>
<tr>
<th>Model</th>
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<th>Internal SR 2000</th>
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<tr>
<td>APS DAT</td>
<td>1.3GB</td>
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<td>APS Turbo DAT</td>
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<tr>
<td>APS HyperDAT</td>
<td>1GB</td>
<td>$1199</td>
</tr>
</tbody>
</table>

*Actual data compression and tape capacity vary, greatly depending on the type of data recorded, the system parameters, and environment.

**DAX Media (Units)**

- 60 meter DAX Tapes — $10
- 90 meter DAX Tapes — $12
- 120 meter DAX Tapes — $22

All APS DAT Drives Include Retrospect by Dantz & FREE DAX Tape

### CD ROM DRIVES

<table>
<thead>
<tr>
<th>Model</th>
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<td>APS T 4101</td>
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<td>APS T 3401</td>
<td>$439</td>
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Global Storage Resource

APS Int'l Sales Line (816) 920-4109
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PowerBook 23–30 PowerBook SCSI Adapter that includes a locking adapter for PowerBook and terminal power indicator. Receiver Power-Merge Lite Free with every APS SCSI DOC!

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Rugged Palm-Sized 23–30 PowerBook SCSI adapters

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WindoWatch 1.5.5 tracks window usage on stand-alone or networked Macs—perfect for Desktop Publishers or any business that bills clients for computer time! The program keeps track of every minute spent in any program, and records this information in the form of a timesheet. Even differentiates between actual use and paused time—when you’re working on several jobs at once.

Publisher: ASD Software

44 MB SyQuest BLOWOUT!

For a limited time, get a 44MB Removable SyQuest Drive for only $199—plus, get your first 44MB cartridge for only 29.95! *Limit one 44 MB cartridge for each 44 MB drive purchased. Call for details.

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Lightning-Fast-LOW PRICE!

Magnum 144 Fax/Data Modem

The Magnum 144, with fax and data speeds of 1.4400bps, provides V.42bis, MNP data compression and error correction for 57,600bps throughput. Other powerful features include automatic speed and error control. Great for modern novices or experts alike.

Manufacturer: Technology Concepts

Item# MOD 0183

Only $99!

8-15 hr. PowerBook Battery

VST TInPack Plus

High-density, maintenance-free batteries for the Power Book, UL listed for safety and comes bundled with VST Utilities battery management software. Manufacturer: VST Power Systems

Also available: ThinPack Complete Item# ACC 1286

$199

The most affordable, full-function keyboard ever!

The Power User 105c Extended Keyboard

Work faster and easier with 105 keys, logically arranged for quick typing, cursor movement, and number calculations. The Power User 105c Extended Keyboard also features an ergonomic design.

Item# INP 0336

$69

Fight Desktop Boredom!

Opus 'n Bill Screen Saver

Screen savers have been known to be funny, but now there’s one with an attitude. Introducing Opus 'n Bill Screen Saver from Delrina. Let Opus and Bill protect you and your monitor from boredom. Windows and Mac.

Publisher: Delrina

Item# UTI 0446

$29.95
MacWAREHOUSE carries more than 2000 Macintosh products, including all the latest releases and new versions. We pride ourselves on getting new products first. Just fill in the information requested below and mail the coupon. We’ll start your free, one-year subscription to the MacWAREHOUSE catalog with the next issue.

Order by Midnight for Overnight Delivery — Only $3.00!
<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
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<tbody>
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<td>Bottom Line Carries Over 8000 Products</td>
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<tr>
<td>VideoScan Studio</td>
<td>$189</td>
</tr>
</tbody>
</table>

DGR Technologies

DGR Technologies is committed to the excellence that has made us the industry leader. Each drive is shipped in an all-steel case with a universal 40 watt power supply, double shielded SCSI cable, external terminator and a free cartridge. (Also for PC's!)
Executive Multi-Media Pack
• Double-Speed/Multi-Session, Kodak Photo CD Compatible.
• Complete with powerful stereo speakers, headphones, microphone and five CD titles. All for only $489

Magic 2GB Tape Drive
Enjoy the benefits of the world's fastest minicartridge tape drive. Backup 2GB of data on a single minicartridge in 30 minutes or less. This high-quality SCSI interface drive provides the best value in minicartridge technology. Compare 35 cents per MB vs. our closest competitor's 65 cents. Each drive comes with Retrospect 2.1 and a two year warranty! $699

Magic Memory
1MB 30pin 90ns ......... $25
2MB 30pin 80ns ......... $68
4MB 30pin 80ns ......... $124
4MB 72pin 60/70/80ns... from 129
8MB 72pin 60/70/80ns... from 259
10MB 72pin ......... $549
32/64MB 72pin 60ns ... $1295/$2795
Powerbook RAM ....... Call
Newton 1MB/2MB ....... from 159
LC VRAM ......... $29
Quadra VRAM ......... $19
ColorBlaster LC ....... $149
All Magic Memory has a 30 day money back guarantee and a lifetime warranty.

Magic 128 Optical Drive
• Turbo Upgrade 999
• Faster than the Fujitsu
• Twice the warranty
Magic 128 Optical/Turbo $739/$838
Magic 230 Optical ....... $899
Magic 256 Optical/Turbo $899
Magic 1.3GB /Turbo ... 2299/2399
128 MB Carts/10 Pack ... 27/240
230 MB Carts ......... 49
256 MB Carts/10 Pack ... 65/690
1.3 GB Carts ......... 135

Magic Modems
Magic Fax Modems
Magic 14.4 Data/FaxModem .... $99
With Voice Mail...... $189
High Speed Modem Cable .... $15
Magic Powerbook Int. Modems
14.4bps Data/FaxModem .... $119
24/96 Data/FaxModem .... $79
All FaxModems come with full feature fax and data software, America Online and CompuServe Starter Kit.

Magic Hard Drives
Magic 240 External .......... $299
Magic 1.0 GB Ext. 9 ms .... $799
Magic 2.0 GB Ext. 9 ms .... $1199
Active Terminator ....... $59
Call us about custom configurations.

Magic 1GB RAID Upgrade for the Power PC 8100
Utilize the advanced SCSI features of you PowerPC to the fullest with the Magic 1GB RAID Upgrade, the ideal solution for desktop video on the PowerPC. This system is compatible with SCSI 1, 2 and Magic Manager 4.3. RAID drives come with software and cables.
Magic 1GB RAID Upgrade External
1.0GB RAID $799 $1899
2.0GB RAID 1495 2499
4.0GB RAID 2999
8.0GB RAID 9495
Software 190/999

Call Bottom Line 1-800-622-3475 or 1-512-472-4956
On the Internet: sales@max.dgr.com

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### Quantum

**Best Byte for MACs**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Seek (ms)</th>
<th>RPM</th>
<th>Access (ms)</th>
<th>128K Cache</th>
<th>Int</th>
<th>Ext</th>
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<tr>
<td>80 MB</td>
<td>17</td>
<td>15</td>
<td>255</td>
<td>512</td>
<td>255</td>
<td>255</td>
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<td>345</td>
<td>512</td>
<td>345</td>
<td>345</td>
</tr>
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</table>

**Capacity Model**
- 520 MB M2624 FI A
- 330 MB M2622
- 1.2 GB M2694ESA

Call 800-524-9952

### Seagate

**2.4 GB Barracuda II** Only $1725

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Model</th>
<th>Size</th>
<th>Access</th>
<th>RPM</th>
<th>Int</th>
<th>Ext</th>
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<td>ST31200N</td>
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<td>10ms</td>
<td>5400</td>
<td>1024K</td>
<td>1024K</td>
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<tr>
<td>1.6 GB</td>
<td>ST11600N</td>
<td>3.5</td>
<td>8ms</td>
<td>7200</td>
<td>1024K</td>
<td>1024K</td>
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<tr>
<td>2.4 GB</td>
<td>ST31500N</td>
<td>3.5</td>
<td>8ms</td>
<td>7200</td>
<td>1024K</td>
<td>1024K</td>
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<tr>
<td>3.4 GB</td>
<td>ST34200N</td>
<td>5.25</td>
<td>10ms</td>
<td>5400</td>
<td>1024K</td>
<td>1024K</td>
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<tr>
<td>9 GB Elite 9</td>
<td>ST61800N</td>
<td>5.25</td>
<td>10ms</td>
<td>5400</td>
<td>1024K</td>
<td>1024K</td>
</tr>
</tbody>
</table>

All Seagate drives come with a 5 year factory warranty and are backed by a 30 day money back guarantee. External drives come with a double shielded system cable and external termination. All advertised models are SCSI 1 & 2 compatible.

### Packard Bell

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Seek (ms)</th>
<th>RPM</th>
<th>Access (ms)</th>
<th>128K Cache</th>
<th>Int</th>
<th>Ext</th>
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<tr>
<td>1.05 GB</td>
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<td>15</td>
<td>230</td>
<td>512</td>
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<td>1.2 GB</td>
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<td>15</td>
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<td>10</td>
<td>15</td>
<td>345</td>
<td>512</td>
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### Fujitsu

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<th>Model</th>
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<tr>
<td>330 MB</td>
<td>M2622</td>
<td>14 ms</td>
<td>128K</td>
<td>510</td>
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<td>520 MB</td>
<td>M2624 FA</td>
<td>9 ms</td>
<td>512K</td>
<td>505</td>
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<tr>
<td>1.2 GB</td>
<td>M2694ESA</td>
<td>8.5 ms</td>
<td>5400</td>
<td>512K</td>
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### Memory Products

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<th>Buffer</th>
<th>Int</th>
<th>Ext</th>
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<tr>
<td>44 MB</td>
<td>SQ255</td>
<td>20ms</td>
<td>5400</td>
<td>1545</td>
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<tr>
<td>88 MB</td>
<td>SQ2110C</td>
<td>20ms</td>
<td>5400</td>
<td>345</td>
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<td>105 MB</td>
<td>SQ310</td>
<td>14 ms</td>
<td>5400</td>
<td>2125</td>
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<td>200 MB</td>
<td>SQ2200</td>
<td>13.5 ms</td>
<td>5400</td>
<td>2125</td>
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</table>

### SyQuest

- One FREE Cartridge included with all SyQuest Products!

### Tape Backup Drives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Model</th>
<th>Media</th>
<th>Int</th>
<th>Ext</th>
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<td>7 GB</td>
<td>HP26470A</td>
<td>4 mm</td>
<td>1925</td>
<td>1925</td>
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<tr>
<td>3.5 GB</td>
<td>HP25480A</td>
<td>4 mm</td>
<td>1105</td>
<td>1105</td>
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<tr>
<td>4-10 GB</td>
<td>HP1533A</td>
<td>4 mm</td>
<td>1365</td>
<td>1365</td>
</tr>
<tr>
<td>20-50 GB</td>
<td>HP1552A &amp; Auto Tape Loader</td>
<td>8 mm</td>
<td>3095</td>
<td>3095</td>
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<tr>
<td>2-5 GB</td>
<td>Exabyte 8200</td>
<td>8 mm</td>
<td>1535</td>
<td>1535</td>
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<tr>
<td>5-10 GB</td>
<td>Exabyte 8500</td>
<td>8 mm</td>
<td>2175</td>
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<tr>
<td>20-50 GB</td>
<td>Exabyte 10 Auto Tape Loader</td>
<td>8 mm</td>
<td>2275</td>
<td>2275</td>
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### QMS Printers

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tr>
<td>PS 410 4PPM,300DPI</td>
<td>$1399</td>
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</tbody>
</table>

### EXTERNAL CABINETS

- Summer Special

**Micropolis 1.7 GB AV** Only $1025

**Seagate 2.4 GB Barracuda II** Only $1725

Both drives are perfect for your Direct to Disk recording needs. SCSI Manager 4.3 every driver for all of your PowerMac & AV needs included with all ProDirect Drives.

### Summer Special

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Both drives are perfect for your Direct to Disk recording needs. SCSI Manager 4.3 every driver for all of your PowerMac & AV needs included with all ProDirect Drives.
### OPTICAL DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
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<tr>
<td>Sony 465</td>
<td>64mb</td>
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<tr>
<td>Rich-9200 EX</td>
<td>32mb</td>
<td>$578</td>
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<td>Maxum-Tahiti L108</td>
<td>16mb</td>
<td>$589</td>
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<td>Maxum-510</td>
<td>32mb</td>
<td>$666</td>
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<tr>
<td>Maxum-610</td>
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<td>$744</td>
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### TAPE DRIVES

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<thead>
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<th>Model</th>
<th>Capacity</th>
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<tr>
<td>Sony DAT 32</td>
<td>25mb</td>
<td>$594</td>
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<tr>
<td>Sony DAT 42</td>
<td>50mb</td>
<td>$639</td>
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### DISK ARRAY RAID SYSTEMS

<table>
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<th>RAID Level</th>
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<tr>
<td>1.0 GB RAID</td>
<td>0, 1, 5</td>
<td>$1299</td>
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<tr>
<td>2.0 GB RAID</td>
<td>0, 1, 5</td>
<td>$2129</td>
</tr>
<tr>
<td>4.0 GB RAID</td>
<td>0, 1, 5</td>
<td>$3499</td>
</tr>
<tr>
<td>6.0 GB RAID</td>
<td>0, 1, 5</td>
<td>$3999</td>
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### PRESENTATION COMBO

<table>
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<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>Syquest 44 &amp; Dual Speed Photo</td>
<td>$555</td>
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### BUNDLE SPECIAL

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Panasonic 128MB</td>
<td>$857</td>
</tr>
<tr>
<td>Sony 128MB</td>
<td>$899</td>
</tr>
</tbody>
</table>

### SPECIALS

- **0% DOWN SUPER LEASING**
  - **DTP SUPER SYSTEM**
    - Includes hard drives, monitor, keyboard, printer, and software.
    - **$1299**
  - **4 GB RAID SYSTEM**
    - Includes hard drives, monitor, keyboard, printer, and software.
    - **$2129**
  - **8 GB RAID SYSTEM**
    - Includes hard drives, monitor, keyboard, printer, and software.
    - **$3499**
  - **16 GB RAID SYSTEM**
    - Includes hard drives, monitor, keyboard, printer, and software.
    - **$3999**

### Other Specials

- **MICROTECH**
  - **250MB**
    - **$499**
  - **500MB**
    - **$999**

### SYQUEST DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<td>Syquest 120</td>
<td>$549</td>
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<tr>
<td>Syquest 220</td>
<td>$999</td>
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<tr>
<td>Syquest 44</td>
<td>$1999</td>
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### SYQUEST DISK DRIVES

<table>
<thead>
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</thead>
<tbody>
<tr>
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<td>$555</td>
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### MICROTECH

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>ScanMaker II/GC80</td>
<td>$485</td>
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### SCANNERS

<table>
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<tr>
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### SCANNERS

<table>
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<td>ScanMaker II/GC80</td>
<td>$485</td>
</tr>
<tr>
<td>ScanMaker II/PL840</td>
<td>$575</td>
</tr>
</tbody>
</table>
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**TOLL FREE Technical Support For Customers**
**HARD DRIVES FROM $270**

**Fujitsu 1.2GIG External**—$755

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Size</th>
<th>Access</th>
<th>Internal</th>
<th>External</th>
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<td>$755</td>
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**Seagate**

**5 YEAR WARRANTY**

<table>
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<td>2.6GIG</td>
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<td>8MS</td>
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<td>Elite 3</td>
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**CONNER**

**5 YEAR WARRANTY**

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<td>CFP1060S</td>
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**Quantum**

**5 YEAR WARRANTY**

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<tr>
<td>22GIG</td>
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<td>9.5MS</td>
<td>E21680S</td>
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**HITACHI**

**5 YEAR WARRANTY**

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<td>3.7GIG</td>
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<td>$1645</td>
<td>$1745</td>
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**MONITORS**

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<th>Model</th>
<th>Price</th>
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<td>Sony GDM-17SE1</td>
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<td>Sony GDM-2038S</td>
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<td>RasterOps Horizon 24</td>
<td>$2259</td>
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<td>RasterOps Paintbd Turbo</td>
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<tr>
<td>RasterOps 8XL</td>
<td>$459</td>
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<td>RasterOps Li</td>
<td>$339</td>
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**CD ROMS**

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<td>Toshiba 4101</td>
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<td>Toshiba 3401</td>
<td>$439</td>
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<td>Sony CDU-561</td>
<td>$385</td>
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<td>Sony 1000</td>
<td>$120</td>
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**OPTICAL DRIVES FROM $765**

**1 YEAR WARRANTY**

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<th>Capacity</th>
<th>Model</th>
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<tbody>
<tr>
<td>128MB</td>
<td>Olympus</td>
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<td>230MB</td>
<td>Fujitsu</td>
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<td>$945</td>
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<tr>
<td>650MB</td>
<td>Ricoh Hyperspace</td>
<td>28MS</td>
<td>$1799</td>
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<tr>
<td>1.3GB</td>
<td>Ricoh</td>
<td>40MS</td>
<td>$2459</td>
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<td>1.3GB</td>
<td>Sony</td>
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<td>$2299</td>
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<td>2.0GB</td>
<td>Hitachi</td>
<td>40MS</td>
<td>$2799</td>
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**TAPE BACKUP SYSTEMS FROM $499**

**2 YEAR WARRANTY**

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<th>External</th>
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<tbody>
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<td>250MB</td>
<td>Tandberg TDC 3660</td>
<td>DC6250</td>
<td>$445</td>
<td>$499</td>
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<td>520MB</td>
<td>Tandberg TDC 3660</td>
<td>DC6250</td>
<td>$565</td>
<td>$625</td>
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<tr>
<td>2GIG</td>
<td>Archive 4320*</td>
<td>4MM</td>
<td>$839</td>
<td>$899</td>
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<tr>
<td>8GIG</td>
<td>Archive Turbo*</td>
<td>4MM</td>
<td>$1039</td>
<td>$1099</td>
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<tr>
<td>4.0-8GIG</td>
<td>Connor 4326 DDS2</td>
<td>4MM</td>
<td>$1089</td>
<td>$1149</td>
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<tr>
<td>1.3-10GIG</td>
<td>Exabyte 8205</td>
<td>8MM</td>
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<td>Sony 5000 DDS2</td>
<td>4MM</td>
<td>$1129</td>
<td>$1189</td>
</tr>
</tbody>
</table>

**RAID SYSTEMS FROM $1399**

1.0 GIG RAID $1399
2.0 GIG RAID $1999
6.0 GIG RAID $3899

- FASTEST RAID FOR VIDEO VISION USERS.

4.0 GIG BARACUDA 2 RAID. $4885

**MEDIA**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Tape</th>
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<tr>
<td>60M</td>
<td>10</td>
<td>128MB Optical</td>
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<td>90M</td>
<td>12</td>
<td>650MB Optical</td>
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<tr>
<td>112M</td>
<td>18</td>
<td>1.3GIG Optical</td>
</tr>
<tr>
<td>120M</td>
<td>22</td>
<td>2.0GIG Optical</td>
</tr>
</tbody>
</table>

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MACWORLD August 1994 215
### Quantum

**WE HAVE THE DRIVE YOU WANT AT AN UNBEATABLE PRICE!**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Model</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>105MB</td>
<td>LPS105S</td>
<td>$239</td>
<td>$298</td>
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<td>170MB</td>
<td>LPS170S</td>
<td>$275</td>
<td>$335</td>
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<tr>
<td>230MB</td>
<td>LPS230S</td>
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<td>$375</td>
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<tr>
<td>270MB</td>
<td>LPS270S</td>
<td>$335</td>
<td>$409</td>
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<td>300MB</td>
<td>LPS300S</td>
<td>$389</td>
<td>$459</td>
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<tr>
<td>340MB</td>
<td>LPS340S</td>
<td>$449</td>
<td>$529</td>
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<tr>
<td>1050MB</td>
<td>EMP1050</td>
<td>$729</td>
<td>$799</td>
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<tr>
<td>1800MB</td>
<td>EMP1800S</td>
<td>$999</td>
<td>$1029</td>
</tr>
</tbody>
</table>

**SyQuest Drive**

- Includes Retrospect 2.0, 1 tape, and cables. OPTIMA DeskTape Software mounts DAT on desktop.
- Includes formatting software, and cables. We stock multiple bay enclosures for custom configurations.

**Tape Drives**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Type</th>
<th>Brand</th>
<th>Speed</th>
<th>Feature</th>
<th>Cache</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>250MB</td>
<td>QIC 150</td>
<td>Archive</td>
<td>7MB/min</td>
<td>MultiFunction</td>
<td>N/A</td>
<td>$459</td>
<td>$529</td>
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<tr>
<td>250MB</td>
<td>DAT</td>
<td>Conner</td>
<td>11MB/min</td>
<td>MultiFunction</td>
<td>N/A</td>
<td>$459</td>
<td>$529</td>
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<td>250MB</td>
<td>DAT</td>
<td>Conner</td>
<td>17MB/min</td>
<td>MultiFunction</td>
<td>N/A</td>
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<td>$529</td>
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<td>Multidrive</td>
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<td>MultiFunction</td>
<td>N/A</td>
<td>$459</td>
<td>$529</td>
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<td>250MB</td>
<td>DAT</td>
<td>Multidrive</td>
<td>106MB/min</td>
<td>MultiFunction</td>
<td>N/A</td>
<td>$459</td>
<td>$529</td>
</tr>
</tbody>
</table>

Includes FORMATTER SOFTWARE AND CABLES. We are happy to order any Syquest or Storage Technology Drive.

**Hard Drives**

- We have the drive you want at an unbeatable price!
- Includes formatting software and cables. We stock multiple bay enclosures for custom configurations.

**Power HD**

- New AV series hard drives are specifically designed for enhanced digital video and audio performance in applications such as multimedia, desktop publishing, and video editing.
- We will beat any advertised Micropolis price.

**Optical Drives**

- High performance optical drives.
- Ask for your free "Dear to Compare" specification brochure.
- Includes Syquest Manager 4.3 compliant drive, cables, and 1 free disk.

**SyQuest Drives**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Model</th>
<th>Speed</th>
<th>Transfer Type</th>
<th>Warranty</th>
<th>Internal</th>
<th>External</th>
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<td>88MB</td>
<td>SQ3105</td>
<td>14.5ms</td>
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<td>2 Years</td>
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<td>$739</td>
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<tr>
<td>250MB</td>
<td>SQ3205</td>
<td>18ms</td>
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<td>2 Years</td>
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<td>300MB</td>
<td>SQ3300</td>
<td>16ms</td>
<td>Single disk</td>
<td>2 Years</td>
<td>$689</td>
<td>$729</td>
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<tr>
<td>1080MB</td>
<td>SQ4145</td>
<td>9ms</td>
<td>Single disk</td>
<td>2 Years</td>
<td>$699</td>
<td>$739</td>
</tr>
</tbody>
</table>

Includes driver software with music play, $25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock!

**Optical Drives**

- We have the drive you want at an unbeatable price!
- Includes formatting software, and cables. We stock multiple bay enclosures for custom configurations.

**CD-ROM Drives**

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**Tape Drives**

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**SyQuest Drives**

- Includes driver software with music play, $25 Photo CD processing coupon, and cables. Multi Drive CD Towers in stock!

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- Includes formatting software, and cables. We stock multiple bay enclosures for custom configurations.
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Best Computer Columnist
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<thead>
<tr>
<th>Computer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power PC 8100/80</td>
<td>$1,120.00</td>
</tr>
<tr>
<td>136MB, 2.1GHz HD, 128MB RAM, 1.2GHz HD, CD-ROM, 1.2GHz HD, CD-ROM</td>
<td>$1,120.00</td>
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<tr>
<td>SuperMac 21' 128MB RAM, 1.2GHz HD, CD-ROM, 1.2GHz HD, CD-ROM</td>
<td>$1,120.00</td>
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<td>Thunder IIGX 1.2GHz HD, CD-ROM, 1.2GHz HD, CD-ROM</td>
<td>$1,120.00</td>
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<td>Extended keyboard</td>
<td>$1,120.00</td>
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<td>Sharp-JX-610 Scanner</td>
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<td>Power PC 7100/66</td>
<td>$995.00</td>
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<tr>
<td>40MB, 1.2HD CD</td>
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<tr>
<td>SuperMac 21'</td>
<td></td>
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<tr>
<td>Extended keyboard</td>
<td>$995.00</td>
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<tr>
<td>&amp; Mousepad</td>
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<tr>
<td>Sony 20' Trinitron</td>
<td>$2,255.00</td>
</tr>
</tbody>
</table>

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<th>DEMO/LIMITS</th>
<th>LOGICBOARDS</th>
<th>TRADE &amp; UPGRADE</th>
<th>SCANNERS</th>
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</thead>
<tbody>
<tr>
<td>7100 40B 160</td>
<td>7200</td>
<td>3070</td>
<td>NIKON</td>
<td>CALL</td>
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<tr>
<td>7100 40B 320</td>
<td>7200</td>
<td>3070</td>
<td>AGFA</td>
<td>CALL</td>
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<td>7100 40B 620</td>
<td>7200</td>
<td>3070</td>
<td>UMAX</td>
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<td>7100 40B 1200</td>
<td>7200</td>
<td>3070</td>
<td>KYOCERA STOCK</td>
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<td>7100 40B 2400</td>
<td>7200</td>
<td>3070</td>
<td>KYOCERA STOCK</td>
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</tbody>
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<th>Quadra</th>
<th>PowerBook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Group Servers M. 60/30/95</td>
<td>CALL</td>
<td>CALL</td>
</tr>
<tr>
<td>950 6-9/525</td>
<td>2699/3149</td>
<td>4200/4599</td>
</tr>
<tr>
<td>950 15-15/2GB</td>
<td>3899/4298</td>
<td>800/12/20</td>
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<tr>
<td>840 av 8-230/500</td>
<td>2899/3099</td>
<td>600 av 8-250/500</td>
</tr>
<tr>
<td>840 av 16-500/1GB</td>
<td>3399/3799</td>
<td>600 av 16-500/1GB</td>
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<td>840 av 16-2GB/W-CRD</td>
<td>4099/4499</td>
<td>600 av 16-500/1GB</td>
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<tr>
<td>800 8-500 CD</td>
<td>2999</td>
<td>600 av 16-500/1GB</td>
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<td>660 av 8-250/500</td>
<td>1399/1599</td>
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<td>2459/2849</td>
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<td>620 8-16 W-DOS CARD</td>
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<td>610 av 16-2GB/W-CRD</td>
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<td>2129/2329</td>
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<td>605 4-8/200</td>
<td>709/849</td>
<td>605 8-240/500</td>
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<td>1049/1249</td>
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<td>4195/4959</td>
<td>IVX 4-80/230</td>
<td>CALL</td>
</tr>
</tbody>
</table>

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| LaserWriter IIIG/IIIG Board | $1499/799 |

| Hard Drive |
| 680/120/160 MB HD 2.5” | 109/179/210 |
| 210/250/340MB HD 2.5” | $249/319/419 |
| 525MB HD 2.5” For PowerBooks | $619 |
| 40/150/270MB HD 3.5” | $79/210/290 |
| 340/525MB/1GB | $279/399/665 |

| HP PACKARD |
| LaserJet 4M/MP | $965/1295 |
| LaserJet 4M/4M 220V | 1835/1925 |
| LaserJet 4 Plus | $1899 |
| 4SI MX/4SI | $4250/2865 |
| DeskWriter /DeskWriter C | $235/375 |
| DeskWriter 550C/550C | $440/559 |
| DeskWriter 520/320 Portable | $290/315 |
| DeskJet 1200C PostScript | $1995 |
| PalmJet XL300 PostScript | $3190 |
| ScanJet IC Demo | $595 |
| ScanJet IPX /ICX New | $549/899 |

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| 2036/S/203B8 | 1899/2049 |

| NEC |
| 3FGX/4FGX/5FG | $499/629/999 |
| 5FGP/6FGP/3PG | $1099/2049/2350 |

| radius |
| 21” Clr. | 1069 |
| Precision Clr.20V/17 | 1599/2129 |
| Precision Pro 24X | $1349 |
| VideoVision Studio | $3399 |
| IntelColor 20I | $1849 |

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$2199
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7100 8/250
7100 16/250/WIN
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$3699
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$2399

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8/230 W/CD
$2999
$3099

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$2999
$3099

QUADRA 660AV

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8/230 W/CD
8/230 W/CD
$3099
$3399

QUADRA 650

8/230
8/230 W/CD
8/230 W/CD
$3099
$3399

QUADRA 610

8/160
$1299
8/160
8/230 W/CD
8/230 W/CD
8/500
8/500
$1299
$1899

QUADRA 605

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8/160
$599
8/160
$729
8/160
$999
8/160
$1199

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### Power Macs

<table>
<thead>
<tr>
<th>Model</th>
<th>RAM</th>
<th>Price</th>
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### Power Books

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### New Items

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<td>ColorPro</td>
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<td>Newton 110</td>
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### Apple Monitor

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<td>16&quot;17&quot;</td>
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<td></td>
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<tr>
<td>14&quot;AV/20&quot;</td>
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### Apple Printers

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<th>Model</th>
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<td>320/630</td>
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<tr>
<td>300/310</td>
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<td>360/810</td>
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### Specials

<table>
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<tr>
<td>Centris 660AV 8/230</td>
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<td>Nikon CoolScan</td>
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<td>Dura 250 4/230</td>
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<td>Dura Dock 345</td>
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<tr>
<td>AppleCD 150</td>
<td>130</td>
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<tr>
<td>MicroDesk AV/VT 1700 1550</td>
<td>1550</td>
</tr>
</tbody>
</table>

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### Quadra's

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
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<td>840AV 0/0</td>
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<tr>
<td>840AV 16/500</td>
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<td>840AV 64/2.0</td>
<td>5905</td>
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<tr>
<td>800 8/500</td>
<td>CALL</td>
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<tr>
<td>950 8/400</td>
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<td>605 8/230</td>
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<td>610 16/230</td>
<td>1895</td>
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<tr>
<td>650 16/500</td>
<td>2495</td>
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### Supermac

<table>
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<td>20UXT/17T</td>
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<tr>
<td>Thunder/24</td>
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<tr>
<td>ThunderHGS 1360</td>
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<td>Proof Positive</td>
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### AGFA

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<td>Studio Scan Trmp.</td>
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<td>Arcus + Trmp.</td>
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### UMAX

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<td>UC840</td>
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<td>UC1200SE</td>
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<td>Transparency</td>
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### GCC

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<td>ColorEase</td>
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<td>450GL</td>
<td>1395</td>
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<td>PCDWriter 200</td>
<td>CALL</td>
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### Kodak

<table>
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<tr>
<th>Item</th>
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<tr>
<td>ColorEase</td>
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<tr>
<td>PCDWriter 200</td>
<td>CALL</td>
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### Hewlett Packard

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<td>DeskWriter 520</td>
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<td>DeskWriter 350C</td>
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<td>LaserJet 4ML</td>
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<td>ScanJet 4CXX/HP</td>
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<td>JetStore 2000E ZGBDAT 1395</td>
<td>40GBOpticalJukeBox 13900</td>
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<td>13GBOpticalDrive 2495</td>
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**Demo Mac's/Parts**

<table>
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<tr>
<td>840</td>
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<td>860</td>
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<td>SuperFloggy</td>
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<tr>
<td>Quadra 950LogicBoard</td>
<td>1900</td>
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### $ave on $oftware

Microsoft Excel 4.0 311
Microsoft Office 3.0 456
Microsoft Word 5.1 271
Microsoft PowerPoint 3.0 289
Charis Works 2.1 189
Quark Express 3.2 566
Charis FileMaker Pro 2.1 253
Aldus PageMaker 5.0 538
Microsoft FoxPro 2.5 432
Microsoft Project 425
Connectix Ram Doubler 59
Now Utilities 4.0 2.79
Adobe Photoshop 2.5 548
Illustrator/Freehand 5.0.1379
Fractal Design Painter 2.1 252
Aldus FreeHand 2.0 363
HSC Kai PowerToll 2.0 99
Adobe Premier 3.0 432
Aldus SuperPaint 3.5 56
AltSys Font Grabber 4.0 259
Gold Disk Video大赛 1.5 125
Disney ScreenSaver 29
KidPix 1.2 33
M.Y.O.B. 4.0 w/Payroll 106
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PI XAR Typewriter 2.0 159
Lotus 1-2-3 1.1 295

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LaserWriter II ...........................................799.
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LC Logic bd ............................................149.
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ADB Mouse .............................................49.
40-Meg internal for Mac Portable ..................59.
800k External Floppy .................................110.
1.25-Seg Top/PIC Drive .............................149.
Ilcx/ IIfx Quadra/lex Power Supply ...............25.
Portable Battery Recharger ..........................49.
1200 Baud Personal Modem w/ cable ...............29.
40-Meg S 25 (Internal Mac II tic/fic) ...............49.
Nubus Black & White Video bd .....................49.
LC Ethernet Board ....................................149.
CRT & Yoke Assy (Plus & SE) .................149.
IIfx Case .............................................299.
Mac Plus Keyboard ....................................59.
20-Meg Internal Hard Dr. .............................49.
Portable 2400 baud Internal Modem ...............49.
40-Meg External Hard Drive .........................149.
Case & Power Supply Mac IIfx/llx ..................169.
Personal NT Logic Bd ..................................79.
Mac Portable Numeric Keypad ......................25.
8-Bit Video Board (nubus) .........................149.
Personal SC Logic Board .........................129.
SuperMac Video (video image trace) ..............199.
Ilcx case & power supply ..........................159.
Classic Logic bd ...............................129.
CRT & Yoke Assy ....................................149.
Mouse (Mac Plus) ......................................59.
Ilcx 1-Meg SIMM ..........................29.
Ilcx Case .............................................129.
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PowerPC 6100/60 Logic Bd $1085
PowerPC 7100/66 Logic Bd $1198
PowerPC 8100/80 Logic Bd $1798

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Q 610 8/230 $1698

Q 610 8/230/CD $1849
Q 650 8/230/CD $2499

Q 660AV 8/230 $1379
Q 660AV 8/230/CD $1619
Q 950 8/0 $2099
Q 950 24/1GB $4119
Q 840AV 8/230 $2499
Q 840AV 8/230 W/CD $2549

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Duo 280c 4/330 NEW $3499
Duo 280c 12/330/DOCK $3899
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APPLE DUO EXPRESS MDM $898

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Spectrum 24 series IV $839
Radius 3-XP $459
Radius Precision Pro 24x $1359
Radius Precision Pro 24xk $755

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StyleWriter II $279
Color StyleWriter PRO $659
Personal LaserWriter 30 $898

LaserWriter Select 300/300PMM $1448

LaserWriter Pro 630 Fax Modem $298
LaserWriter Pro 630 $1989
LaserWriter Pro 810 $4298

Heath Packard
HP LaserJet 110N +SF $299
HP LaserJet 560c $989
HP LaserJet 110 w +SF $389
HP Laserjet 4 M $989

PB 135B - 80 $1189
PB 165 4/80 $1395
PB 520 4/160 NEW 040 $2028
PB 520c 4/160 NEW 040 $2599
PB 540 4/240 NEW 040 $2849
PB 540c 4/240 NEW 040 $4395

Monitors
Apple 14 Color Plus $399
Apple 14" Color Trinitron $539
Apple 14" AV $629
Apple 17" Color $989
Apple Multiple scan 20" $1929
Sony 17SE Color Monitor $1198
SuperMac 17" T Color $989
SuperMac 20" Plus Monitor $1539
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Radius Rocket ZS

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All sizes PCMCIA cards for Newton. Call For Pricing!

72 Pin Memory for the new Macs! 80ns 70ns 60ns

Prices Changing Daily—Call for Best Prices!

PowerBook Memory

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<tr>
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Newton PDA Upgrade Products

512K Static RAM Upgrade 125.00
1 Megabyte Static RAM Upgrade 175.00
2 Megabyte Static RAM Upgrade 249.00
2 Megabyte Flash Card Upgrade 275.00
4 Megabyte Flash Card Upgrade 425.00
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- 2x8x70 ................................... $59 8x8x70 (16fns) .......... $154
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- 4x8x70 ................................... $147 16x8x70 (High Profile) ..... $635

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- IBM 4MB 60ns 72 pin SIMM $145

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- Long Life Battery 140-180c .................. 59
- Automobile/Adapter 100-180 / DUO ....... 69
- Newer Technology DUO Micro Dock SCSI / Color. $135 / 1259
- Rasterops Duosym 8 / 16 SC ............... $269 / 1559

VIDEO RAM / FPU'S ETC...
- Video RAM 256K / 512K ....................... $20 / 35
- 16MHz LC - Classic II ........... 149
- 16MHz Color Classic ......................... 49
- 25MHz LC III ................. 149
- 35MHz Performa 600 / Duo Dock FPU .... 69
- Centris FPU ................................. 519
- MicroMac SIMM/1024 / SIMM/1024 changer .......... 137 / 98

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- SONY
  1.3 / 1.2GB Optical .................. $119
  650 / 600MB Optical .................. $109
  128MB 3.5" Optical .................. $46

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- 3.5" DD / 3.5" HD ................... $75 / 125
- 3.5" HD Pre-Formatted ............... $13.50

SONY CD-R
- 650MB / 74 Min. ............... $25
- 550MB / 63 Min. .................. $23

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- 4MM 60M 1.3GB .................. $13
- 4MM 90M 2GB .................. $14
- 4MM 120M 4GB ............... $24

Cleaning Cartridge ................... $12.50

SONY 8mm DAT
- 8MM 15M 600MB .................. $12
- 8MM 5M 2.4GB .................. $14
- 8MM 112M 5GB ............... $16

Cleaning Cartridge ................... $28

SYQUEST 270MB CARTRIDGES $65

SyQuest 44MB Cartridge 1-4 / 5-9 / 10+ .... $59 / 58.50 / 57.50
- Pre-Formatted ................... $65

SyQuest 88MB Cartridge 1-4 / 5-9 / 10+ ... $69 / 58 / 67

SyQuest 105MB Cartridge 1-4 / 5-9 / 10+ ... $62 / 61 / 60

SyQuest 200MB Cartridge ................ $65 / 64 / 63

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128MB 3.5" Optical, Apple Format .... $96
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1.2 / 1.3GB Optical 512 b/s / 1024 b/s .......... $112
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- PB165C-180C / 180C-4 / 6 / 8 / 10 .......... $155 / 1323 / 1519 / 1405
- DUO 210 - 280C 4 / 6 / 8 / 10 .......... $1869 / 1205 / 1300
- DUO 210 - 280C 12 / 14 / 20 / 25 .......... $1851 / 1859 / 1832 / 1430
- PB 520 - 540C 4 / 8 / 16 / 32 .......... $139 / 1459 / 1879 / 11709

MODEMS
- Supra v.32bis S/R Fax 14.4 w / C / S .......... $225
- Supra v.32bis S/R Fax 14.4 LC w / C / S .......... $215
- Supra 2400 Modem ONLY .......... $159
- Supra 2400 Modem S/R Fax 9600 w / C / S .......... $139
- Supra v.32bis PowerBook 14.4 .......... $225
- Supra 28.8 External w / C & S .......... $32
- Global Village OneWorld Fax 1 line / 2 line. $559 / 1299
- Global Village OneWorld Remote Access Server-2 $1639
- Global Village Teleport /
  Powerport (Bronze) 24 / 96 / 48 .......... $97
- Global Village Teleport /
  Powerport (Gold) 14,400 .......... $279
- Global Village Teleport /
  Powerport (Mercury) 19,200 .......... $329
- U.S. Robotics Sportster 14.4 S / R Fax .......... $237
- Prometheus PowerBook 14.4 w / Voice .......... $309
- Zoom Pocket 14.4 w / Voice .......... $239
- Zoom 14.4 w / Voice .......... $169
- Zoom V. Fast 28.8 modem .......... $249

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**SYQUEST DRIVES ONLY $289**

<table>
<thead>
<tr>
<th>Model Details</th>
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<tr>
<td>105MB SyQuest</td>
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<td>88c (R/W 44) SyQuest</td>
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<td>Rumi CD-ROM Drive</td>
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<td>CD-ROM Bundle Includes</td>
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<td>Rumi SyQuest Drive</td>
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<td>Sony Speakers and 4 CD Titles</td>
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<tr>
<td>Rumi 44MB SyQuest (FREE Cartridge)</td>
<td>$289</td>
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<td>Rumi 88c (R/W 44) SyQuest (FREE Cartridge)</td>
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**RUMI HARD DRIVES**

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<td>Rumi 2.0GB Ext (Seagate Barracuda)</td>
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<td>Rumi PowerBook 210 Int (Toshiba)</td>
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**SYQUEST DRIVES**

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**RUMI DAT DRIVES**

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**MORE DRIVES**

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<td>PMO RCD 202 Recordable CD-ROM</td>
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<td>PLI Quick Array 1GB</td>
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<td>PLI Quick Array 4GB</td>
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<td>PLI 1.3GB Maxoptics (Tahiti III Mech)</td>
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<td>PLI 10Gb Dat Drive</td>
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**SCANNERS / PRINTERS**

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<td>HP IIP</td>
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<td>UMAX UGC60 PS/LE</td>
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<td>UMAX UC840</td>
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<td>UMAX 1260</td>
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<td>Microtek ScanMaker IIIC</td>
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**NETWORKING**

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<td>Sonic Micro SCSI PowerBook</td>
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<td>Sonic FriendlyNet 10T/Thin</td>
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<td>Sonic Starbase TV</td>
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<td>Sonic HubLife 5 port</td>
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**MONITORS / VIDEO**

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<td>RasterOps Clearview</td>
<td>$499</td>
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<td>Color 17 Monitor</td>
<td>$499</td>
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<td>RasterOps 20&quot; MultiScan</td>
<td>$1619</td>
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<td>Color Display</td>
<td>$2479</td>
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<td>Other Monitor</td>
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<td>E-Machines Futura IXS</td>
<td>$159</td>
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<td>E-Machines Ultima LX</td>
<td>$629</td>
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<td>Sony 17FSE</td>
<td>$1249</td>
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<td>Sony GDM 2036s</td>
<td>$2039</td>
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<tr>
<td>Dell PowerBook 210 Int (Toshiba)</td>
<td>$409</td>
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**HP Deskwriter Printers Now Available**

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- E-Machines Ultima LX

- Sony 17FSE

- Sony GDM 2036s

- Dell PowerBook 210 Int (Toshiba)

- HP Deskwriter Printers
# Memory Guide

## PowerPC
- 8meg Kit: $309
- 16meg Kit: $634
- 32Meg Kit: $1279
- 64meg Kit: $2598

## Hard Drives

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<td>Quantum</td>
<td>2y. Ward</td>
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<td>127mb</td>
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<td>Fujitsu</td>
<td>2y. Ward</td>
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<td></td>
<td>520mb</td>
<td>$589/649</td>
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<tr>
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<td>1.2Gig</td>
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<td></td>
<td>2.4Gig</td>
<td>$1789/1889</td>
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## PowerBook
- 140/170: $1499
- 140/180: $1599
- 140/240: $1999

## Quantum
- 2y. Ward INT/EXT:
  - 44mb: $249/289
  - 88mb: $379/419
  - 200mb: $648/698
  - 105mb: $979/1029
  - 125mb: $1085/1139

## Turbo 040
- 33MHz Turbo 040: $629/799
- 40MHz Turbo 040: $999

## Suquest
- INT/EXT:
  - Memory Direct 44: $249/289
  - Memory Direct 88c: $379/419
  - Memory Direct 200: $559/599
  - Memory Direct 105: $339/379
  - Memory Direct 270: $619/659

## MODEMS
- Global Village Power Port Bronze: $95
- Silver: $259
- Gold: $479
- Global Village TelePort Bronze: $119
- Silver: $279
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Lessons in Creativity
Most books about creativity are cuties with exercises, brain teasers, and cartoons (like The Macintosh Way). They're supposed to tickle you into creativity. Then there's Shekerjian's book. It is a complete, radical, and welcome departure from any book I've ever read about creativity.

Uncommon Genius has 14 chapters, each explaining one aspect of creativity by examining how MacArthur award winners do their thing. Award winners are not limited to the arts or a narrow concept of creative fields. For example, Shekerjian writes about a woodworker, an environmentalist, a translator, and a neurophysiologist (you're probably as amazed as I am that there's no HyperCard programmer on this list).

The main point of the book is that creativity is not a brilliant flash from heaven after the clouds part. Shekerjian found that the MacArthur award winners find something they're good at and work at it for years, take risks because risks are part of change, and endure years of uncertainty and frustration. Truth be known, this is an accurate description of how Macintosh was created.

The MacArthur Awards
Uncommon Genius examines the work methods of 40 winners of the John D. and Catherine T. MacArthur Foundation fellowship (the so-called genius award). The foundation was set up by John D. MacArthur. He was the Bill Gates of his day; he owned Bankers Life and Casualty—at the time the second-largest life and accident insurance company in the world—and enormous landholdings in Florida.

At his bequest, most of his $2.5 billion estate went to create a foundation that was second in assets only to the Ford Foundation. One aspect of the MacArthur Foundation's work is to encourage risk-taking and forward thinking, so each year the foundation gives about $9 million in awards.

A secret committee of about 100 experts, from a wide range of fields, nominates people. One cannot apply for the award. Armed with nominations, the foundation's staff further examines the work of potential winners.

If you are selected, the foundation calls you out of the blue and tells you that you've won. Winning means you get $30,000 to $70,000 a year for five years. The purpose of the money is to catalyze quantum leaps in creativity by providing the arts or a narrow concept of creative fields. For example, Shekerjian writes about a woodworker, an environmentalist, a translator, and a neurophysiologist (you're probably as amazed as I am that there's no HyperCard programmer on this list).

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Two pearls of wisdom in Uncommon Genius will strike at the heart of any Macintosh owner.

Pearl one: "There are no secrets, no inside easy steps that everybody hopes for. We all want to find the secrets, but they just don't exist," says MacArthur award winner Shirley Brice Heath, anthropological linguist.

Have you ever had a friend or relative who buys his or her first Macintosh, takes it home, sets it up, and expects to be the world's greatest graphic artist—or writer or businessperson—in an hour? You have? Then you know what Shirley's talking about.

Pearl two: "I don't get too excited by my victories or too disappointed by my defeats, and in that way I come closer to peace of mind and that deep inner place that creativity comes from," says award winner Michael Lerner, social scientist.

Does Apple's whipsaw management style drive you crazy? One day the company is arrogantly crowing that it's introduced a new computer. The next day it lays off 2000 employees because earnings per share are down for the quarter.

Oy vey. If we could only get Apple execs to listen to Michael. Apple is completely dependent on creative products, so it needs to cultivate a "deep inner place" in order to survive.

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